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Emotional Expressions as Appeals to Recipients

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Emotion expressions convey information. One important kind of information, from a communicative perspective, is information about what is demanded of the recipients of the expression. Compared to the vast body of research that focuses on whether, and to what degree, emotion expressions convey information about inner states, there is surprisingly little systematic research on the information emotion expressions convey about what the expresser wants the recipient to do. The present research documents for the first time the set of appeals associated with the expressions of anger, fear, happiness, sadness, and disgust. In two studies, we found that (a) generally, for each emotional expression, a core appeal is perceived as being made on recipients, but also a range of complementary demands, and that (b) context matters, as is the case for social perception of emotions in general. In this case, who caused the emotion expression affects the mapping between emotional expressions and appeals. Finally, (c) recipients report intentions to comply with these appeals, as can be expected from a functional point of view. Overall, these findings put the focus squarely on the imperative dimension of emotional expressions and lend support to the view that emotional communication entails an attempt to influence recipients rather than simply to inform them about how expressers feel or what they may do next.

Keywords: theory of affective pragmatics, appeals, emotion expressions, context effects

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What is the point of expressing emotions? There is relative agreement that emotion expressions have a communicative function—even though there is disagreement on what exactly they communicate and whether this communication reflects the internal state of the organism (Darwin, 1872/1965; Fox et al., 2018; Fridlund, 1994; Lindquist et al., 2013). Importantly, in recent years, a consensus has emerged that emotion communication does not exist in a vacuum but takes place in social contexts, which can also impact our understanding of a given expression (Barrett et al., 2011; Hareli et al., 2018; Hess & Hareli, 2016).

When discussing the communicative aspect of emotions, it is important to distinguish between what emotions the agent is experiencing and what emotions the agent is expressing. From a signaler-based perspective, the relevant question is whether a given signal reflects a given internal state of the signaler. From a recipient-based perspective, the question is whether a given signal is interpreted in a given way. The discussion on whether emotion expressions reflect internal states and whether such states are best described dimensionally or in terms of discrete emotions (Barrett et al., 2009) presupposes a signaler-based perspective. Crucially, this perspective is entirely separate from the recipient-based perspective (Hess, 2017), which focuses uniquely on how observers react to the signal.

Specifically, the use of facial expressions in the arts, films, and literature demonstrates that people understand emotional facial displays to express emotions, and they react as a function of this understanding (cf. Niedenthal & Brauer, 2012). It is quite possible that a recipient infers the presence of an emotion that the agent does not experience but is in fact expressing with their behavior. Hence, it is important to understand the types of information that people derive from expressions that they consider to be signals of emotion in a given context. Among the types of information potentially transmitted by emotion expressions are information about what the organism might do next, that is, action tendencies (Frijda, 1987; Frijda et al., 1989); information about antecedents implied by appraisal patterns associated with specific emotions (e.g., Fontaine et al., 2013; Roseman, 1991; Roseman et al., 1990); as well as information about the person's values and motivations (Hess & Hareli, 2019).

Yet very little empirical focus has been put on the information about what the expresser wants the perceiver to do. Especially from an evolutionary perspective, this omission is glaring. In

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the late 1970s, Dawkins and Krebs (1978) formulated their well-known attack on classical ethology, which had characterized communication as information transfer. Dawkins and Krebs (1978) argued instead that the emphasis should be on how communicative signals change the behavior of recipients. In later publications, Krebs and Dawkins (1984) acknowledged that influence and information both play an essential role in communication, setting the stage for the contemporary view that communication is an attempt to influence a recipient through information transfer, where both the signal and the response to the signal are adaptations (Maynard-Smith & Harper, 2003; Scarantino, 2013).

This view of communication puts the focus on the *imperative dimension* of emotional expressions, that is, on the demands that expressions make on perceivers. The information that expressions convey about what the expresser wants the perceiver to do is bound to play a crucial role in influencing recipients to change their behavior to the advantage of expressers. It is important to note that the demand is inherent to the expression and does not depend on the volition of the expresser. For example, an expresser may aim to suppress their fear, but if this fear leaks out, the leaked fear expression still demands help from onlookers. Despite its crucial role in emotion communication, the imperative aspect of the expression has only rarely been addressed empirically.

The "appeal" terminology we use was originally introduced by Bühler (1934) to describe what he considered to be the three primary functions of language: to represent states of affairs (*Darstellungsfunktion*), to express inner states (*Ausdrucksfunktion*), and to make appeals (*Appellfunktion*) to others. Scherer (1988b) applied Bühler's framework to emotion expressions, suggesting that they work as symbols of the eliciting event, as symptoms of the emotional state of the sender, and as appeals to get the recipient to do something (see also Hess et al., 1995). Fridlund's (1991, 1994) behavioral ecology view took up Dawkins and Krebs' (1978) insights by describing facial displays as "social tools" that "aid the negotiation of social encounters" by declaring "what we will do in the current situation, or what we would like the other to do" (Fridlund, 1994, p. 130). Fridlund often referred to what "we would like the other to do" as a "request"—for instance, crying may signal a request for succor. The majority of his examples of how facial displays work as social tools, however, referred to "what we will do in the current situation," that is, to "states of action readiness."[1]

Notable, however, is that the imperative dimension and declarations of intent were not treated separately. For example, "readiness to attack" was spelled out by Fridlund (1994) as the message "back off or I'll attack," which combines a (conditional) action tendency (I will attack unless . . .) and a request (back off). Yet it is vital that these elements are separated because what a person will do in the current situation and what a person would like the other to do are very different things.

The present research had the goal of investigating appeals in emotional communication. Specifically, what are (some of) the appeals that people perceive? And once they perceive them, are recipients willing to comply with these appeals? Does context affect these processes? In the next section, we briefly describe the theoretical framework that we relied on to answer these questions, namely the theory of affective pragmatics.

The Theory of Affective Pragmatics and the Experimental Literature on Appeals

The theory of affective pragmatics (TAP; Scarantino, 2017) describes the different types of information that people can infer from emotion expressions, using a framework inspired by speech act theory (Austin, 1962). TAP's key proposal is that in expressing emotions, we engage in communicative moves analogous to four types of speech acts:

- *Expressives* have the communicative point of expressing the signaler's emotions (e.g., wrinkling one's nose in a certain context has the communicative point of expressing disgust).
- *Commissives* have the communicative point of committing the signaler to a future course of action (e.g., smiling in a certain context has the communicative point of committing the expresser to a positive interaction).
- *Declaratives* have the communicative point of representing/appraising how things are in the world (e.g., crying in a certain context has the communicative point of representing/appraising a situation as a loss).
- *Imperatives* have the communicative point of trying to get the recipient to do something (e.g., baring one's teeth in a certain context has the communicative point of making an appeal that the recipient stops their behavior).

This taxonomy is predicated on the idea that emotional expressions never just signal emotions but always synchronously involve four communicative moves that articulate the range of possible social motives associated with emotional communication. Further, it suggests that the meaning of any communicative move depends on context. The goal of the present research was to focus on the communicative point of imperatives, which aim to get the recipient to do something.

The connection between appeals and imperatives is straightforward: The term "appeal" is intended to characterize the information emotional expressions convey under an imperative communicative point. TAP proposes that emotional expressions have the communicative point (among others) of trying to get the recipient to do something, and the appeals tell us exactly what they are trying to get the recipient to do.

A point needs to be clarified to prevent misunderstandings. TAP endorses a broad notion of emotional expression: We can express emotions through facial, vocal, and bodily changes but also by telling people how we feel. We assume that the kinds of appeals made possible by a given emotional expression are the same independently of the specific communicative channel. Thus, scowling

[1] This early focus on states of action readiness was likely due to the influence of ethology on the behavioral ecology view. Ethology's view of signaling was indebted to Oskar Heinroth's (1911) conception of "intention movements," understood as "behavior[s] typically associated with an act, emitted while intending to (or about to) commit the act" (Fridlund 1994, p. 61). Examples of the states of action readiness Fridlund had in mind can be found in Table 1 of Fridlund (1994, p. 129), under the column "Behavioral Ecology View (signification of intent)." Interestingly, in Crivelli and Fridlund (2019), the column's heading for the behavioral ecology view is no longer "signification of intent" but rather "social uses" for facial displays, which rectifies the earlier emphasis on declarations of intent.

at someone who lights a cigarette in a no-smoking area and telling that person they are making us angry are bound to have equivalent interpersonal effects, as long as they are perceived by the recipient as expressing the same emotion (barring possible differences in perceived intensity; see also Van Kleef, 2009). In this research, we focused on facial expressions, but we expect our results to generalize to all other ways to express emotions.

Several authors have discussed the notion that emotional expressions are associated with appeals, yet empirical evidence is scarce. Parkinson (1995) offers an insightful account of the "communicative agendas" associated with emotional expressions, proposing the following "agendas": "take me seriously, and give me the respect I deserve!" (anger), "help/protect me!" (fear), "forgive me!" (guilt), "let's celebrate the moment!" (happiness), "let's not give up!" (hope), "comfort/reassure me!" (sadness), "be my special ally!" (love), and "adjust your opinion of me upward in accordance to my achievement!" (pride). These communicative agendas strike us as plausible, and they all clearly are descriptions of appeals. However, to the best of our knowledge, this set of appeals has not been empirically derived or tested. As Parkinson (1995, p. 285) put it, the list is a "preliminary translation of core relational themes for different emotions into the terms of the communicative model." Some limited empirical evidence that emotion expressions signal appeals was provided by Yik and Russell (1999), who tested Fridlund's behavioral ecology view against the basic emotion perspective. This research takes for granted Fridlund's theory-based list of social messages, which does not separate appeals and declarations of intent. The same applies to Scherer and Grandjean (2008), who based their research on the ability of perceivers to associate to faces' emotion labels, social messages, action tendencies, and appraisals on Yik and Russell's list of social messages.

The most extensive empirical investigation of the imperative dimension of emotional expressions we are aware of is by Horstmann (2003), who asked subjects whether feeling states, behavioral intentions, or action requests are the dominant information conveyed by emotional expressions. Although we found Horstmann's (2003) approach valuable and borrowed aspects of it in our empirical treatment of context, his experimental approach contradicts a core assumption of TAP, namely that emotional expressions at the same time manifest the expresser's emotions (expressives), commit the expresser to future action (commissives), appraise or represent how things are (declaratives), and make appeals to recipients (imperatives). Information about feeling states or behavioral intentions is just as important as information about appeals, so forcing subjects to choose between them is problematic. Most importantly, Horstmann's experiments did not address what we take to be the key question: What specific appeals, if any, are associated with different emotional expressions?

Our Predictions

Our first prediction on the imperative dimension of emotional expressions was that facial expressions that are associated—at least in the mind of the observer—with different emotions are also associated with different (sets of) appeals. That is, recipients will infer different demands with respect to anger, fear, happiness, sadness, and disgust expressions.[2] This is what the theory of affective pragmatics leads us to expect because it assumes that emotional expressions are nonrandomly associated with social motives in predictively useful ways.

However, since emotions do not occur in a vacuum, the social context in which the expressions are elicited can be expected to meaningfully impact the potential appeals. Specifically, the idea that each emotional expression is associated with specific social motives does not mean that each expression is associated with just one specific appeal. Rather, as a function of the context in which the emotion is expressed, different appeals may serve the expresser's goals. At the same time, not just any appeal can be associated with a given emotional expression. Rather, there is a restricted set of appeals associated with each type of expression depending on context. In this research, we focused specifically on one aspect of context, namely on who caused the emotional expression. Indeed, much of emotion research does not specify the cause of the expressions that participants are asked to judge. At the very least, we have to distinguish between emotional expressions caused by the recipients themselves and emotional expressions that recipients are only witnessing without being their cause.

Hence, our second prediction was that recipients would infer different appeals from observer-caused versus witnessed emotional expressions. If an appeal is a demand to do something, recipients who have caused the facial expression should perceive somewhat different demands than recipients who are just bystanders. Intuitively, if I am the person making you angry, what you ask of me should differ from what you ask of me if someone else is making you angry and I am just witnessing the incident.

Our third prediction was that recipients would generally show behavioral compliance with the appeals they infer. The theory of affective pragmatics predicts that the communicative moves made via emotional expressions are going to have the intended communicative effects at least on average. For instance, Ekman (1997) noted that anger expressions are appeals to recipients to stop what they are doing. If recipients systematically ignored this demand, there would be no clear communicative advantage for signalers to express anger, and selection would work against engaging in a costly activity that leads to no benefits (Searcy & Nowicki, 2005). Notably, this is also what the behavioral ecology view leads us to expect because it assumes that displays coevolved with perceiver sensitivity to them, which implies that both the production and the consumption of displays give selective advantages (Fridlund, 1994).

Which appeals the recipient complies with and to what degree should also be affected, in part, by whether a recipient caused the expression or is just witnessing it. If I prevent you from getting a resource we both want and you are angry at me, my motivation to comply with your perceived demand to stop what I am doing may be counteracted by the fact that we are competing for the resource. But if someone else thwarted you and I am just witnessing your anger, I may be more motivated to comply with your perceived demand for help since we are now potential allies in your confrontation with someone else.

To test these predictions, we conducted two studies. In Study 1, we tested whether participants infer appeals from emotion expressions in a systematic way. In Study 2, we assessed whether participants express a tendency to comply with these appeals. In both studies, we distinguished between observer-caused emotional

[2] We focused on these five emotions because they can be more reliably detected from pictures of facial expressions than any other expressions (Kirouac & Dore 1985).

expressions, which are caused by the expression's recipient, and witnessed expressions, which are caused by someone else.

Study 1

Method

Participants

A total of 753 (402 women, 351 men) participants with a mean age of 38 years (*SD* = 11.64) were recruited through Amazon Mechanical Turk and completed the study after passing control questions probing for attention. We aimed for a minimum of 25 participants per cell in a complete between-participants design. Our data can be accessed here: https://osf.io/a9guj/.

The study was approved by the institutional review board (IRB) at Georgia State University (where Andrea Scarantino works) on December 12, 2018, with IRB authorization H19248 (reference 352400).

Stimulus Materials

Facial expressions of anger, disgust, fear, joy, and sadness by four men and four women were taken from the static pictures subset of the North European models of the Amsterdam Dynamic Facial Expression Set (Van der Schalk et al., 2011). This results in a total of 5 (emotion) × 2 (gender) × 4 (identities) = 40 faces.

Procedure and Dependent Measures

Participants were told that they would see a photo showing the reaction of a person to a specific situation. Half of them were then instructed to imagine that they were the cause of this reaction, and the other half was asked to imagine that another person, unrelated to them, was the cause of this reaction and that they were just a witness of it. This was done to reinforce the notion that there is a specific cause to the expression. We did not guide this imagery in any way except to specify the cause of the emotion expression as being oneself versus someone else. Participants were asked to write down the event they had imagined. These open responses, available on request, indicate that subjects imagined plausible scenarios in which their behaviors toward the expresser would cause a certain emotional expression (e.g., when given an anger expression, the participant imagined that insulting the expresser had elicited the expression) or someone else's behaviors toward the expresser would cause a certain emotional expression (e.g., when given a fear expression, the participant imagined that a threat to the expresser by someone other than the participant had elicited the expression).

To make sure that participants perceived the event that supposedly elicited the expression as we expected them to, they were asked to rate the event that caused the expression on a series of 13 questions based on a short version of the appraisal section of the GRID questionnaire (Fontaine et al., 2013). This questionnaire also contains questions regarding the perceived cause of the event, which we intended to use as a manipulation check. However, thanks to the feedback of an anonymous reviewer on a previous version of this article, we realized that the questions were not as unambiguous as we had thought. In particular, it is not clear how to interpret participants' responses about what caused the expression—participants may or may not have taken the expresser's perspective. We therefore only report the results for these analyses in the online supplemental materials for the sake of transparency but did not use them as manipulation checks.

Participants were then asked to indicate to what extent they thought the expression signaled each one of seven salient appeals from a list we developed empirically (see the online supplemental materials for details on how the list was constructed). Specifically, participants were asked to what degree the individual in the picture would, consciously or unconsciously, want the participant to help the expresser/side with them, repair the relationship with them, celebrate/affiliate with them, stop what they are doing, comply with their demands, empathize with them, and be warned about the situation.

Finally, as an expression manipulation check, participants were asked to rate the degree to which the person in the photo showed disgust, anger, fear, happiness, sadness, and neutrality. All scales were anchored with 0 (*not at all*) and 6 (*to a very large extent*). The study was conducted in a between-participants design, and each participant saw only one model expressing one of the above-mentioned emotions.

Result

Manipulation Check

A 5 (Emotion Expression) × 6 (Emotion Scale) × 2 (Cause) analysis of variance was conducted on the perceived emotion ratings. Significant main effects of emotion expression, $F(4, 743) = 17.55$, $p < .001$, $\eta_p^2 = .09$, and emotion scale, $F(5, 3715) = 190.13$, $p < .001$, $\eta_p^2 = .20$, were qualified by an Emotion Expression × Emotion Scale interaction, $F(20, 3715) = 189.72$, $p < .001$, $\eta_p^2 = .51$. As shown in Table 2 of the online supplemental materials, in the upper panel, simple-effects analyses revealed that all expressions were rated highest on the respective target scale and significantly lower on all other scales. No other significant effects emerged. Thus, overall, the emotion expressions were perceived as intended.

Appeals

The main focus of Study 1 was to assess whether specific appeals were associated with specific emotion expressions. For this, we conducted a 7 (Appeal) × 5 (Emotion Expression) × 2 (Cause) analysis of variance with the within factor appeal and the between factors emotion and cause.

Significant main effects of emotion expression, $F(4, 743) = 11.33$, $p < .001$, $\eta_p^2 = .06$, and appeal, $F(6, 738) = 41.65$, $p < .001$, $\eta_p^2 = .25$, as well as an appeal by emotion expression, $F(24, 2964) = 20.41$, $p < .001$, $\eta_p^2 = .14$, an appeal by cause, $F(6, 738) = 11.10$, $p < .001$, $\eta_p^2 = .08$, and an appeal by emotion expression by cause interaction, $F(24, 2964) = 3.73$, $p < .001$, $\eta_p^2 = .03$, emerged. The TAP predicts a specific pattern of appeals for each emotion dependent on cause. That is, we predicted that some appeals should be strongly perceived for some emotions (e.g., the appeal to empathize for sadness), whereas other appeals should be not perceived at all (e.g., to celebrate for sadness). To assess the specific pattern of appeals dependent on cause and emotion, we conducted simple-effects analyses using one-way repeated-measures analysis of variance on the appeal factor separately for each cause and emotion

expression and conducted post hoc tests (LSD, $p < .05$); all differences we discuss below were significant.

Appeals were predicted to be specific to emotion expressions. As noted above, this implies that some appeals were expected to be perceived at very low intensity for some expressions. This was indeed the case. However, due to the large *N*, almost all appeals were rated significantly different from zero. Based on the post hoc tests, we therefore distinguished between *core appeals*, which are rated highest across conditions, and *complementary appeals*, which are rated significantly lower than core appeals but also significantly higher than the remaining appeals. The discussion will focus on core and complementary appeals only. Table 5 of the online supplemental materials shows the *F* values and significance levels in the upper panel, and Table 6 shows means and standard deviations. Means and standard errors are shown in Figure 1.

Happiness. For both observer-caused and witnessed happiness expressions, the appeal to celebrate/affiliate was the core appeal in the sense that this appeal was rated highest and significantly higher than the complementary appeals. The appeals to help/side with and to empathize emerged as complementary appeals. In other words, they were rated significantly higher than the remaining appeals but lower than the core appeal. Thus, the pattern of perceived appeals for happiness focused on the theme of affiliation, in keeping with Fredrickson's (2001) broaden-and-build model of positive emotions, which hypothesizes that positive emotions like happiness broaden one's awareness, encourage novel thoughts and behaviors in interactions with others, and ultimately build resources.

Anger. For observer-caused anger expressions, no core appeal emerged. The appeals to stop, to be warned, to comply, and to empathize were all rated at about the same level and significantly higher than the remaining appeals. For witnessed anger expressions, a similar pattern emerged with the difference that the appeal to empathize emerged as the core appeal and the appeal to help/side with the expresser was rated roughly as high as the appeals to stop, to be warned, and to comply. Thus, anger appeals were focused on the theme of stopping one's activity and doing as requested, along with demands to pay attention. This applied to both observer-caused and witnessed emotional expressions. For witnessed anger, a demand for help became dominant as well. More important is the fact that for witnessed anger, the appeal to empathize with the expresser was the dominant one. These results are in line with the prevailing view on the function of anger (Fischer & Roseman, 2007) as a means to block another person's interfering action.

Sadness. For observer-caused sadness expressions, the core appeal was to empathize with the expresser, and the complementary appeal was to stop what the recipient is doing. For witnessed sadness expressions, the core appeal remained to empathize with the expresser, and the complementary appeal became to help/side with the expresser. In this case, empathetic responding and providing support were predominant themes, a result that resonates with the proposal that sadness has the function of supporting social behavior by evoking empathy and helping responses in others (Keltner & Kring, 1998). For observer-caused expressions of sadness, the appeal to stop also emerged as important, which makes sense if you are the cause of the expression you are perceiving.

Fear. For observer-caused fear expressions, the appeal to stop was clearly the core appeal, followed by the complementary appeals to empathize and to be warned, which were rated significantly higher than other appeals. For witnessed fear expressions, the appeals to empathize and to be warned emerged as core appeals, whereas the appeals to help/side with the expresser and to stop emerged as complementary appeals.

Thus, the theme of danger avoidance, which is widely associated with the function of fear (LeDoux, 2003), played out differently depending on who caused the expression. Whereas the core appeal for observer-caused fear expressions was the appeal to stop one's dangerous behavior, the core appeal for witnessed fear expressions was the appeal to be warned about a danger the recipient did not produce.

Disgust. For disgust expressions, the cause of the expression was also very important. For observer-caused disgust expressions, the appeal to stop emerged as a core appeal, with the complementary appeals to comply, to be warned, and to empathize, which did not differ significantly. By contrast, for witnessed disgust expressions, the appeals to empathize and to be warned emerged as core appeals, with all other appeals rated much lower. The themes of stopping one's behavior (if you are responsible for the disgust expression) or being warned about a situation (if you are not responsible for the disgust expression) align with the function of disgust, which is to avoid physically or morally contaminating entities or behaviors (Rozin et al., 2008).[3] As was the case for anger, the appeals to empathize and to comply were also strongly perceived.

Discussion

Participants recognized the emotion expressions as intended and judged what the expressers demand of them as dependent of the expression and its cause. Most relevantly in this context, there is a systematic relation between the emotions expressed and the appeals perceived. Some appeals were more strongly associated with particular emotional expressions than any other appeals, and they consequently capture a "core demand" associated with an emotional expression in a given context (only observer-caused anger expressions lacked a core demand in this study).

Importantly, the appeals signaled by different emotion expressions were congruent with the function of the emotion being expressed and the presumed cause of the expression. For example, a fear expression produced by the dangerous behavior of the recipient was perceived by the recipient as a core appeal to stop, whereas the same fear expression was perceived as a core appeal to be warned and to empathize with the expresser if not caused by the recipient.

Similarly, a sadness expression caused by the sadness-inducing behavior of the recipient was perceived by the recipient as a core appeal to stop, whereas when the recipient did not cause the expression, the perceived core appeal was to empathize. Only happiness expressions were associated with the same core appeal to celebrate/affiliate whether they were caused by the recipient or by someone else. This makes sense because for a happy occasion to be enjoyed, it does not typically matter who caused it.

In addition, there are "global appeal patterns" that emerge across emotions whenever their functions overlap. Broadly speaking, emotions

[3] Observer-caused disgust expressions are likely to refer to moral disgust because they are caused by a person (the recipient), whereas witnessed disgust expressions may refer to both moral and physical disgust because they are elicited by an unspecific cause.

like fear, anger, and disgust have the function of evading a negative predicament of some sort. When the predicament is caused by the person one is communicating with, the most fruitful approach would be to make this person stop whatever they are doing. Hence, appeals related to ending the situation were more strongly perceived when fear, anger, and disgust were observer caused than when they were witnessed. By contrast, when the person one communicates with is just a witness of the event, they do not have the power to directly end the event. Thus, appeals for help, for being warned about the negative situation, and for empathizing were more strongly perceived when fear, anger, and disgust expressions were caused by someone else.

In sum, Study 1 shows that participants associated appeals with emotion expressions in predictable and systematic ways that align with the proposed functions of these emotions. Typically, the core appeal for an emotion expression depends on whether participants imagined that they caused the expression or that they just witnessed it. The latter finding points to the importance of considering context when discussing the appeal function of emotion expressions.

Study 2

Whereas Study 1 focused on establishing that participants associate specific appeals with specific emotion expressions, Study 2 aimed at assessing whether participants feel inclined to comply with the appeals they perceive. To test this hypothesis, we used the same design and the emotion and appeal scales described above. In addition, we asked participants to rate the degree to which they are inclined, in response to the expression, to act one way or the other. For this, we reworded the seven appeals in terms of recipients' action tendencies. That is, we asked participants to what degree they would, upon seeing the expression, be inclined to help or/side with the expresser, repair the relationship with them, celebrate/affiliate with them, stop what they are doing, comply with their demands, empathize with them, and be warned about the situation. Next, we asked them to what degree they felt inclined to do nothing in response to the expression. Participants then rated the emotion expressions, as in Study 1, and finally rated the appeals by indicating to what degree the individual in the picture would, consciously or unconsciously, want the participant to act according to the seven appeals.

Method

A total of 618 (358 men, 256 women, and four "other") participants with a mean age of 37 years (SD = 10.67) who were recruited through Amazon Mechanical Turk completed the study and passed control questions probing for attention. We aimed for a minimum of 25 participants per cell in a complete between-participants design. Our data can be accessed here: https://osf.io/a9guj/.

The study was approved by the IRB at Georgia State University (where Andrea Scarantino works) on December 12, 2018, with IRB authorization H19248 (reference 352400).

Results

Manipulation Check

A 5 (Emotion Expression) × 2 (Cause) analysis of variance was conducted on the perceived emotion ratings. Significant main effects of emotion expressions emerged for all emotion ratings except for neutrality. Simple-effects analyses revealed, as for Study 1, that all expressions were rated highest on the respective target scale and significantly lower on all other scales (for means, standard deviations, and confidence intervals, see Table 2 of the online supplemental materials). For fear only, the main effect of emotion was qualified by an Emotion Expression × Cause interaction, $F(4, 608) = 2.58$, $p = .036$, $\eta_p^2 = .02$. However, simple-effects analysis revealed that, regardless of what caused the emotion, ratings of fear were higher in the fear condition than in any other emotion condition and were similar for both causes. Thus, overall, the emotion expressions were perceived as intended.

Appeals

The goal of Study 2 was to assess whether participants feel inclined to comply with the demands of the appeals they perceive. For this, we asked participants to rate the appeals. This allowed us to also assess whether the appeal structure from Study 1 replicated.

We employed profile analyses separately for each emotion and each cause. Profile analyses allow to assess whether the profiles of the appeals, that is, the pattern of ratings for each emotion and cause, (a) differ with regard to level between the studies (that is, are the ratings overall higher or lower in one study relative to the other?); (b) are flat, that is, there is no difference between appeals within studies (which we know not to be the case for Study 1); and (c) show parallelism, that is, whether the shape of the profiles is the same or differs between studies. Profiles that do not differ in level and that are parallel are coincident. Table 1 shows the F values for these analyses. Significant effects are marked in bold. Figure 1 shows the profiles of appeals for Studies 1 and 2.

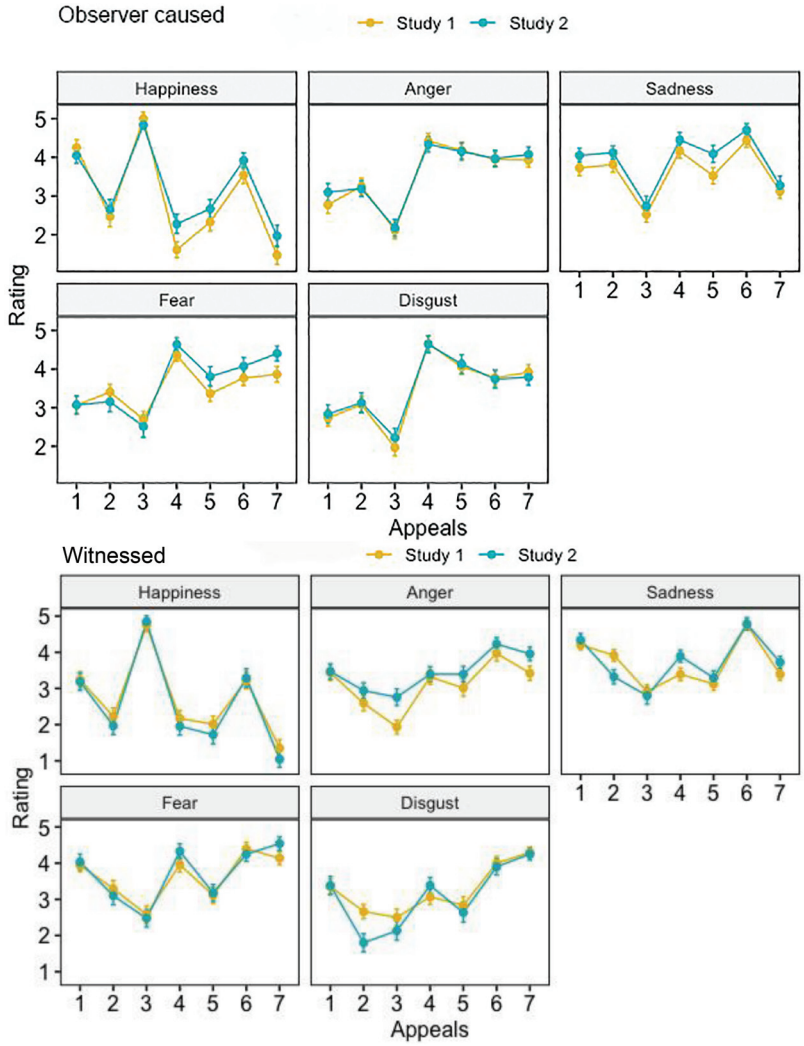
As can be seen, none of the profiles are flat, which was expected as Study 1 had shown that the expressions were associated with clear

Table 1
F Values and Degrees of Freedom for the Profile Analyses

	Caused by self			Caused by other		
Emotion	Level	Flatness	Parallelism	Level	Flatness	Parallelism
Happiness	$F(1, 123) = 0.24$	**$F(6, 118) = 44.10$*** **	$F(6, 118) = 1.19$	$F(1, 134) = 0.36$	**$F(6, 129) = 49.17$*** **	$F(6, 129) = 0.24$
Anger	$F(1, 137) = 0.08$	**$F(6, 132) = 23.23$*** **	$F(6, 132) = 0.40$	$F(1, 140) = 2.83$	**$F(6, 135) = 20.28$*** **	$F(6, 135) = 1.48$
Sadness	$F(1, 125) = 2.75$	**$F(6, 132) = 23.23$*** **	$F(6, 118) = 0.40$	$F(1, 140) = 2.83$	**$F(6, 165) = 24.70$*** **	**$F(6, 165) = 2.86$* **
Fear	$F(1, 124) = 0.65$	**$F(6, 119) = 17.89$*** **	$F(6, 119) = 0.91$	$F(1, 130) = 0.10$	**$F(6, 125) = 18.55$*** **	$F(6, 125) = 1.02$
Disgust	$F(1, 136) = 0.06$	**$F(6, 131) = 19.80$*** **	$F(6, 131) = 0.22$	$F(1, 132) = 0.72$	**$F(6, 127) = 26.85$*** **	$F(6, 127) = 1.74$

Note. Significant effects are in bold.
*$p < .05$. **$p < .011$. ***$p < .001$

Figure 1
Appeals for Studies 1 and 2 as a Function of Emotion and Cause



Note. Appeals: 1 = to help/side with, 2 = to repair relationship, 3 = to celebrate/affiliate, 4 = to stop, 5 = to comply, 6 = to empathize, 7 = to be warned. See the online article for the color version of this figure.

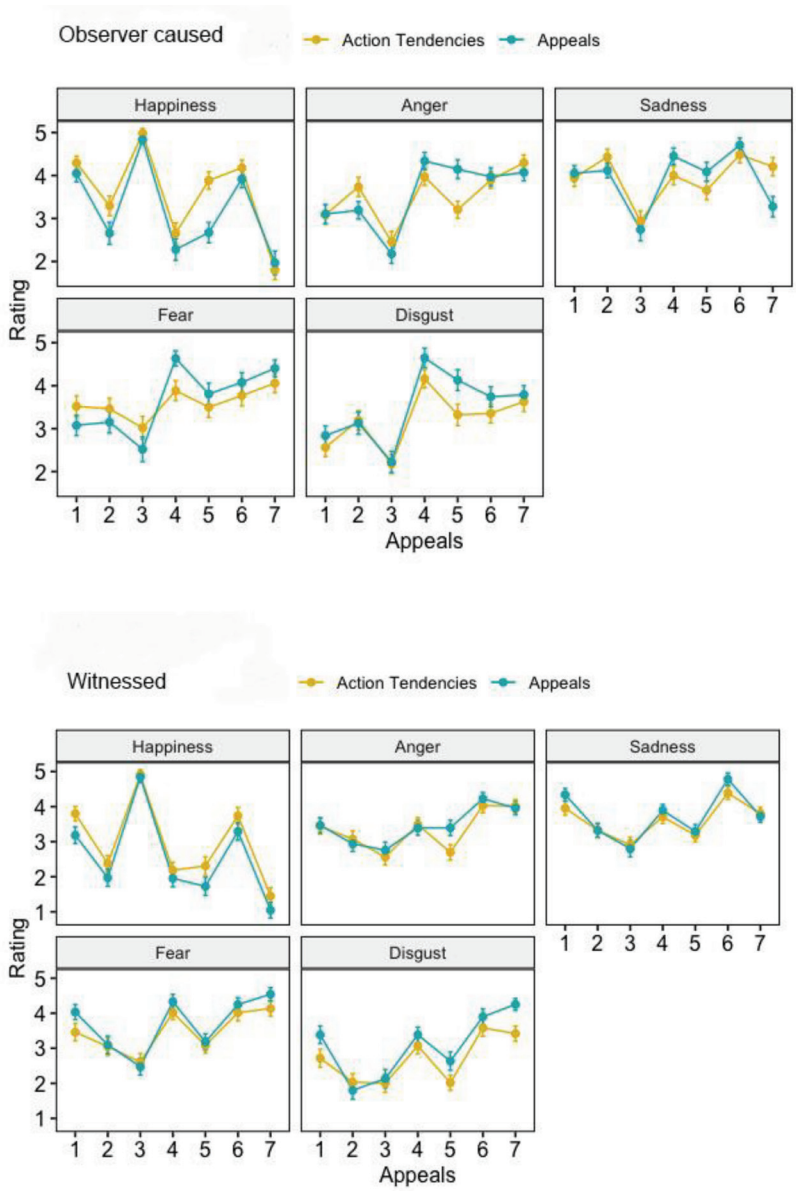
appeal profiles. Also, there was no difference in level between the studies, suggesting that overall mean ratings of appeals were comparable between studies. More importantly, all of the profiles, with the sole exception of the profile for witnessed sadness, were parallel. For this expression, the appeal to repair the relationship was higher in Study 1 than in Study 2, changing the shape of the profile and rendering the two profiles nonparallel. No other differences emerged. Hence, overall, the profiles are coincident and replicate very closely.

Do Action Tendencies Match With Appeals?

To test the perceiver's willingness to act as requested, we compared self-reported action tendencies to perceived appeals. According to TAP (Scarantino, 2019), participants should be overall inclined to comply with appeals, that is, to report action tendencies in line with the appeals. Figure 2 shows the means and standard errors for self-reported appeals and action tendencies. As can be seen, profiles are indeed rather similar for action tendencies and appeals, suggesting overall compliance. We distinguish two alternatives to straightforward compliance: overcompliance and noncompliance. First, participants may express an even stronger inclination to act the way the appeal is perceived to request (e.g., repair the relationship) than they perceive having been asked for, in which case we describe them as overcompliant. Compliance and overcompliance are two forms of what we call *appeal-congruent* action tendencies. Second, participants may be significantly less willing to act as the appeal is perceived to request (e.g., repair the relationship) than they perceive having been asked to do, in which case we describe them as noncompliant (their action tendencies are *appeal-incongruent*).

We compared the self-reported action tendency ratings with the perceived appeal ratings. If participants report action tendencies

Figure 2
Mean Perceived Appeals and Self-Reported Action Tendencies as a Function of Emotion and Cause



Note. Appeals: 1 = to help/side with, 2 = to repair relationship, 3 = to celebrate/affiliate, 4 = to stop, 5 = to comply, 6 = to empathize, 7 = to be warned. See the online article for the color version of this figure.

that correspond to appeals, then there should be no significant difference between appeals and action tendencies (for means and standard errors, see Figure 2), that is, we tested for a null effect. As conventional student *t*-tests are not designed to test for invariance (Rouder et al., 2009), we used Bayesian paired tests in Jamovi (Şahin & Aybek, 2019) to test the hypothesis that both means are equal. The results are shown in Figure 3. The numbers in the cells are the Bayesian factors. Bayesian factors below 1 indicate support for the null hypothesis, and numbers above 3.2 indicate support for the notion that means are different. Numbers in between do not indicate support for either hypothesis. Overall, participants were inclined to comply or overcomply with most appeals in most contexts. The appeal to stop was not complied with for observer-caused fear, and the appeal to be warned was not complied with for witnessed disgust. The appeal to comply was not complied with for anger and disgust expressions, whether observer caused or witnessed. This may be due to the fact that, whereas it is clear what compliance demands for appeals asking for a specific behavior, it may not be entirely clear what complying with the appeal to comply may involve

Figure 3
Summary of Bayesian Paired-Samples t-Test Results

	To help / side with	To repair the relations hip	To celebrate/ affiliate	To stop	To comply	To empathize	To be warned
Happiness OC.	0.43	46.10	0.27	0.56	13552.40	0.47	0.21
Happiness W.	4.31	3.08	0.15	0.24	19.02	2.42	2.90
Anger OC.	0.13	75.74	0.51	1.14	248.26	0.15	0.24
Anger W.	0.14	0.17	0.24	0.15	7.53	0.23	0.14
Sadness OC.	0.16	0.57	0.20	1.35	0.61	0.31	16.41
Sadness W.	0.67	0.14	0.71	0.21	0.16	1.17	0.16
Fear OC.	1.02	0.39	4.18	58.34	0.36	0.38	0.42
Fear W.	1.25	0.14	0.18	1.12	0.15	0.29	1.00
Disgust OC.	0.34	0.15	0.14	0.84	19.51	0.93	0.18
Disgust W.	3.18.	0.59	0.20	0.43	8.60	0.73	29.94

Note. green = compliance, gold = overcompliance, red = noncompliance, white = undecided. OC and W stand for observer-caused and witnessed expressions. See the online article for the color version of this figure.

behaviorally in some contexts. Yet, overall, only 6 of the 70 tests suggested noncompliance.

However, some cases of compliance, in particular those cases in which both ratings of appeals and self-reported action tendency are low, such as, for example, the appeal to stop for happiness, may represent situations in which participants did not perceive an appeal and also were not inclined to act that way. These cases are conceptually different from the cases we were most interested in, which involve perceiving a concrete appeal and doing what has been requested.

To be able to separate those two sets of "compliance" cases, we also provided the option of "doing nothing." We conducted an emotion by cause analysis of variance on this (in)action tendency. Only the main effects of emotion, $F(4, 608) = 2.91$, $p = .021$, $\eta_p^2 = .02$, and cause, $F(1, 608) = 19.90$, $p < .001$, $\eta_p^2 = .03$, emerged significantly. Specifically, this (in)action tendency was rated lower for observer-caused than witnessed emotions, which suggests that perceivers were more inclined to inaction when witnessing expressions to events they did not cause than when they were the cause of the event. Across emotions, this (in)action tendency was rated lowest for sadness, which differed significantly only from anger and disgust (which were rated similarly). In addition, it was rated lower for fear than for anger. Overall, all means were below the midpoint except for witnessed disgust expressions ($M = 3.76$, $SD = 1.82$). No other significant effects emerged.

What these results show is not only that recipients were by and large inclined to do what is asked of them but also that they were more inclined to act than to do nothing when they perceive having been asked. In other words, most cases of compliance were not due to recipients' tendency to *not* do what they have *not* been asked to do. Least inaction was seen for sadness. Given that sadness reflects a significant loss and a demand for help, empathy, and stopping what one is doing when one is responsible for the expression, it makes sense that recipients seem less inclined toward inaction when faced with this expression. In sum, for the majority of comparisons between perceived appeals and recipients' action tendencies, no significant difference emerged. Even when such differences did emerge, they tended to be small (see Figure 2).

This suggests a key implication, namely that perceived appeals play a major role in generating influence. Part of the reason why, say, smiling influences recipients to play, scowling influences recipients to submit, and pouting influences recipients to offer protection is that recipients perceive being asked to do exactly those things when they observe what they recognize as emotional expressions, and typically they declare themselves willing to comply with this perceived appeal.

General Discussion

According to the theory of affective pragmatics (Scarantino, 2017), emotional expressions work as imperatives, namely as communicative tools to get a recipient to do something by means of information transfer. Broadcasting appeals is one of the key social messages at the heart of emotional communication—the others being appraising/representing states of affairs, committing to future actions, and manifesting inner emotional states. Although it has often been acknowledged that emotional expressions make

Table 2
Experimentally Derived Appeals on the Left, Theoretically Derived Appeals on the Right

Our appeals	Other appeals mentioned in the literature
Help the expresser/side with them	"Help/protect me!" (Parkinson, 1995)"Comfort/reassure me!" (Parkinson, 1995)
Repair the relationship with them	"Forgive me!" (Parkinson, 1995)
Celebrate/affiliate with them	"Let's celebrate the moment!" (Parkinson, 1995)
Stop what they are doing	"Don't hurt me. I give up" (Yik and Russell, 1999; Note: "I give up" is not an appeal)
	"Back off or I will attack" (Fridlund, 1994; Note: "I will attack" is not an appeal)
	"Stop what he/she is doing"(Ekman, 1997)
Comply with their demands	"Take me seriously, and give me the respect I deserve!" (Parkinson, 1995)
Empathize with them	"Please hold me and comfort me" (Yik and Russell, 1999)
Be warned about the situation	"Closely scrutinize what is on their own plates" (Scherer, 1988a)

appeals to others (see, e.g., Ekman, 1997; Fridlund, 1994; Scherer, 1988a), this important facet of emotion communication has not commanded systematic empirical investigation so far.

The main goal of the present research was to document the types of appeals that are typically associated with specific emotional expressions. Because emotions occur, and are perceived, in a specific context (Barrett et al., 2011; Hess & Hareli, 2014), we hypothesized that the types of appeals associated with a specific emotional expression would vary to some degree as a function of the context in which the emotion was perceived. To test this idea, we investigated the degree to which appeals varied as a function of whether the observed expression was caused by the recipient or by someone else. Finally, since the imperative dimension of emotions is assumed to serve a crucial goal of communication, that is, to influence others (Maynard-Smith & Harper, 2003; Scarantino, 2013), we predicted that recipients will generally indicate behavioral compliance with the appeals they infer.

To test these predictions, we first assessed the content of imperatives, namely, which specific appeals are made by emotional expressions. To this aim, we focused on expressions of happiness, anger, sadness, fear, and disgust. This yielded a list of seven appeals. Specifically: the expresser wants the recipient to help the expresser/side with them, repair the relationship with them, celebrate/affiliate with them, stop what they are doing, comply with their demands, empathize with them, and be warned about the situation. As predicted, our findings across both studies indicate that different emotional expressions are systematically associated with a set of appeals.

Some of these appeals are more strongly associated with a specific emotion and hence can be seen as a core appeal, and some are less strongly associated with it and can be considered complementary appeals. Which appeals are associated with a specific emotion depends to some degree on whether the expression is caused by the recipient (observer-caused context) or merely witnessed by the recipient (witnessed context). Finally, recipients generally report appeal-congruent action tendencies—they comply or even over comply with what is demanded—and rarely manifest appeal-incongruent action tendencies.

It is notable that, although our appeals have emerged from free responses provided by our participants, they largely match the theoretical proposals we find in the literature on appeals. Table 2 summarizes some analogies.

We do not claim that the appeals we propose exhaust the domain of appeals associated with emotional expressions or that the correspondence between our appeals and the appeals offered by other authors is perfect. Our list is just a starting point, but it has the virtue of having been developed on the basis of subjects' actual responses rather than mere theoretical speculation. We also do not assume that the only way for an agent to make an appeal to, say, "back off" or "empathize" is through emotional expressions, let alone facial expressions. Emotions can be expressed via voice, body postures, gestures, and even touch, and all of these are expected to yield the same appeals. And obviously, an agent can simply ask someone else to back off or empathize with them, with no emotional expression being involved at all.

We are also not committed to the interpretation that it is the emotion label that drives the perception of appeals. It could well be the case that participants also use their reconstruction of appraisals, or action tendencies for that matter, to infer appeals.

Our focus was on whether facial expressions are perceived as signaling specific appeals and on whether observers are inclined to comply with them. As reported, Study 1 showed clear patterns of appeals associated with different expressions depending on context. Study 2 almost perfectly replicated this finding and showed that there is an overwhelming tendency for observers to comply with appeals. In other words, emotional expressions and social messages are not randomly coupled but correlated in ways that allow recipients to make inferences from the emotions expressed to the appeals being made by the expresser. For example, if I infer you are happy rather than sad, I am much more likely to read the appeal to celebrate with you from your facial behavior than the appeal to help you. Conversely, if I read from your facial behavior the appeal to celebrate with you, I am unlikely to infer sadness in your face and likely to infer that you are happy.

These inferences are affected by whether the recipient is the direct cause of the expression or just a bystander. These findings confirm the widely acknowledged importance of context on the perception of emotional expressions (e.g., Hess & Hareli, 2016) but put emphasis on a sometimes neglected aspect of context: the degree to which the recipient takes themself to be responsible for the expression observed.

Our findings also show that in both observer-caused and witnessed contexts, the mapping between emotional expressions and appeals is not one-to-one: Although there generally is a core

demand being made on recipients, there also is a range of complementary demands. These demands are heterogeneous in nature as they involve doing, feeling, and thinking various things. But they are not random—they all belong to a communicative theme distinctive of the emotion.

This suggests that the imperative dimension of emotional communication is more coarse-grained than the imperative dimension of linguistic communication. In speech, I can ask you either to empathize with me (a feeling), to stop what you are doing (a behavior), or to be warned about the situation (a thought). A fear expression directed toward someone responsible for my fear, on the other hand, manages to do all three things at once.

At the same time, we should expect that the context in which an emotion is perceived provides additional information beyond who caused the emotional expression—for example, information about the kind of relationship between the expresser and the recipient, their history and their personality, their cultural background, and so forth. This contextual information is likely to narrow down further the kinds of appeals conveyed by the expression, possibly rendering the imperative dimension of expressions less coarse-grained as more contextual cues are added.

Importantly, the appeals signaled by the expressions tend to align with the theorized functions of the emotion expressed. This points to a hitherto neglected way by which emotions can fulfill their function. As we mentioned earlier, it is often stated that happiness has the function of broadening and building resources (Fredrickson, 2001), that anger has the function of coercing a desired action (Fischer & Roseman, 2007), that sadness has the function of eliciting helping responses (Keltner & Kring, 1998), that fear has the function of avoiding dangers (LeDoux, 2003), and that disgust has the function of removing physically or morally contaminating entities (Rozin et al., 2008). The question is: By virtue of what do these emotions fulfill their functions?

One mechanism is intrapersonal—the emotion may provide the agent with a superordinate system that coordinates the resources of the organism in order to avoid danger, expel a contaminating entity, coerce a desired behavior, and so on. Our data suggest that there is also an interpersonal mechanism available—once an emotion is publicly expressed, it has the ability to influence what recipients do, think, and feel in ways that also can serve the emotion's function. This aspect cannot be investigated by considering the emoting agent without the social context because context influences how recipients comply/overcomply/do not comply with the demands they infer.

For example, fear may be an effective danger avoidance system not only because it provides a superordinate mechanism to coordinate organismic resources toward danger avoidance by preparing the body for escape and heightening attention to escape possibilities (interpersonal mechanism) but also because a fear expression is perceived by recipients as making context-dependent, and generally complied with, demands on recipients (interpersonal mechanism)—stopping what the recipient is doing if they are the cause of the expression or empathizing and being warned if the recipient is just witnessing the events.

Our studies leave several questions open for further empirical investigation. We mention three in particular. The first is why some emotional expressions in some contexts, like observer-caused anger, appear to lack core appeals. This may be an experimental artifact, and there may be a deeper reason why for observer-caused anger the appeal to stop—often anecdotally associated with anger expressions—was rated as high as the appeals to be warned, to comply, and to empathize (for witnessed anger expressions, the appeal to help/side with the expresser was also rated as high as the first three). Arguably, these appeals all make sense for anger. If I have angered someone and this person glares at me menacingly, this certainly can serve to make me stop, which may be a form of compliance. But as anger also signals a conditional intent to attack (Fridlund, 1994), it would make sense to perceive a warning here as well. And in the case of witnessing anger caused by someone else, the appeal to help/side with the expresser to overcome an obstacle also fits the same narrative.

Thus, it may be that anger has a wider scope of meanings that all point in the same direction. If this is the case, it may be possible that in order for the core appeal of anger to be revealed, recipients need additional and more specific contextual information beyond the information concerning who caused the emotional expression. Thus, if we, for example, have reason to believe that the expresser will not attack, the appeal to be warned should be less prominently perceived.

The second question is why recipients declare willingness to comply with the great majority of emotional expressions (we counted 57 out of 70 instances of appeal-congruent action tendencies) and why there exist some exceptions. Although theories of communication tend to assume that, at least on average, signalers affect the behavior of recipients to their advantage and recipients make inferences about signalers to their advantage, the presence of massively compliant recipients' attitudes and the nature of exceptions remain to be explained. Here too, context may play an important role yet to be explored. In this regard, one hypothesis we want to test in the future is whether some recipients simply declare willingness to comply but would not actually comply in a real-world scenario.

The third question pertains to other aspects of context: Which features of the social situation affect core and complementary appeals, other than the degree to which the recipient is responsible for the expression? For instance, are there racial, age, gender, and cultural factors that affect what appeals participants perceive from anger expressions, sadness expressions, disgust expressions, happiness expressions, and fear expressions? And are the degrees of compliance different depending on the expressers' and recipients' race, age, gender, and culture?

All these questions remain to be answered, but we believe we have made a first step in demonstrating that one of the key things we do when we express emotions in a given context is to try and get our audience to do, think, and feel certain things. Remarkably, recipients appear more than willing to comply with our demands, which suggests that emotional communication relies on a vast reservoir of cooperative predispositions that may hold the key to explaining the very origins of nonverbal communication.

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