

BRIEF REPORT

Social messages of crying faces: Their influence on anticipated person perception, emotions and behavioural responses

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The present study examined the beliefs of people on how they respond to individuals with different kinds of facial expressions, including crying. A total of 104 participants viewed photographs of individuals posing crying, neutral, anger, and fear expressions. They indicated how they would judge the person, how they would feel in the presence of the person, and how they would respond to the person. Compared to individuals expressing other emotions, crying individuals were perceived as less emotionally stable and less aggressive. Participants reported more feelings of sadness in response to crying faces. Crying faces also reportedly evoked more emotional support and less avoidance behaviour. Indirect support was found for the idea that crying is an attachment behaviour designed to elicit empathy and support in others.

The role of emotional facial expressions in human interaction has been a subject of interest for several decades. An emotional individual is thought to communicate information about him/herself with the aim of causing particular changes in the social environment (e.g., Fridlund, 1992; Frijda, 1997). Until now, however, only a few empirical studies have examined the influence of facial expressions on (the behaviour of) other people. Crying, although considered as a powerful signal in communication (Cornelius & Labott, 2001; Kottler, 1996), has almost never been included in these studies. The objective of the present study was to investigate how people believe they respond to crying as opposed to neutral, anger, and fear expressions.

Crying is an ubiquitous and uniquely human emotional expression that communicates to others that one is suffering and wants to receive attention or succour (Cornelius & Lubliner, 2003; Fridlund, 1992; Nelson, 2005). It has been suggested that

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the main function of crying is to stimulate others to help to remove a given source of discomfort and to elicit attention, empathy, and support (Frijda, 1997; Kottler & Montgomery, 2001; Nelson, 2005; Sadoff, 1966). Adult crying can therefore be regarded as an attachment behaviour, since these behaviours are specifically designed to elicit caregiving responses from significant others (Bowlby, 1969; Nelson, 2005). Attachment research has indeed shown that crying is an inborn behaviour that functions to call for and to assure the protective and nurturing presence of caregivers (Cassidy, 1999; Zeifman, 2001), and it has been proposed that tears continue to be an attachment behaviour throughout life (Bowlby, 1969; Nelson, 2005).

To date, only Cornelius and colleagues (Cornelius & Lubliner, 2003; Cornelius, Nussbaum, Warner, & Moeller, 2000) have examined how people respond to crying faces. They demonstrated that tearful faces were rated as more emotional and more likely to be indicative of sadness than the same faces with the tears digitally removed (Cornelius et al., 2000). Observers felt that crying people mainly communicated that they wanted help, comfort or to be taken care of (Cornelius & Lubliner, 2003; Cornelius et al., 2000). The majority of participants reported that they would comfort a crying person, whereas viewing a nontearful face predominantly resulted in merely asking the person what was wrong (Cornelius & Lubliner, 2003).

In order to determine whether crying communicates a specific message, the social reactions to crying expressions should be compared with those to other emotional expressions. Frijda (1997) has suggested that crying, anger, and fear expressions all communicate that the other person has to stop his/her ongoing activities. But whereas anger expressions are considered as intimidating behaviour, fear and crying expressions are regarded as help-seeking behaviour (Frijda, 1997). The few empirical studies on the social reactions to emotional expressions have demonstrated that people expressing anger were rated more dominant and less affiliative than people expressing sadness (without tears) or fear (Hess, Blairy, & Kleck, 2000; Knutson, 1996). The differences in person perception between fear and sadness expressions were not that pronounced. Several studies found that sadness, anger, and fear expressions generally elicited the corresponding emotion in observers (Blairy, Herrera, & Hess, 1999; Hess & Blairy, 2001; Lundqvist & Dimberg, 1995) suggesting a process like emotional contagion (Hatfield, Cacioppo, & Rapson, 1994; Mehrabian & Epstein, 1972).

Given the claim of crying as an attachment behaviour, it is important to find out how we respond to crying as opposed to anger and fear. Ideally, experimental studies should be performed that measure the actual behaviour of people in response to the expression of different emotions. Unfortunately, it is very difficult and time-consuming to create many different emotional eliciting situations in one experimental study. An alternative is to let people respond to standardised stimuli, such as photographs of facial expressions. With this method the attitudes and subjective norms of a person concerning a certain response to crying can be measured. Since these factors jointly determine the intention of a person to perform a behaviour (Ajzen & Fishbein, 1980), the self-reported reactions to photographs give a first idea on how people might behave in real-life situations.

In the present study, participants viewed photos of crying, neutral, angry, and fearful faces and indicated how they would perceive the depicted person and how they would feel and behave in presence of the person. Following Frijda (1997), Hess et al. (2000),

and Knutson (1996), we expected that crying people would be perceived as less dominant and more affiliative than people with angry faces, and that crying expressions would elicit more feelings of sadness than any of the other expressions. It was further postulated that crying expressions would stimulate, whereas anger expressions would discourage approach behaviour. Since we consider crying an attachment behaviour, it was expected that crying faces would elicit more empathy and support in the observers.

METHOD

Participants

Participants were 94 first-year psychology students (27 male, 67 female), who received course credits for participation, and 29 first-year economics students (all male), who received a financial reward (7 euros) for participation. 104 participants (84.6%) produced usable data; the data of 19 participants were removed because of too many missing values. The final group consisted of 47 men aged from 17 up to 30 years ($M = 19.7$, $SD = 2.5$), and of 57 women aged from 18 up to 32 years ($M = 20.2$, $SD = 3.1$).

Stimulus material

Photos of six men and six women posing the following eight facial expressions served as stimuli: neutral, smiling, laughing, fear, anger, crying (tears were elicited with eye drops), yawning, and sticking tongue out. These 96 photos were selected from a larger set of photos based on their high recognition rate measured in a pilot study. The series of each poser was divided into two subsets. Subset A contained the neutral, laughing, fear, and sticking tongue out expression, and Subset B contained the smiling, anger, crying, and yawning expression. Subsequently, four sets of 24 photos were formed, each of which contained three subsets A and three subsets B and contained the photos of three male and three female posers. Different participants evaluated each set of photos.

Dependent variables

The response items of the dependent measures were partly based on previously used measures (e.g., Labott, Martin, Eason, & Berkey, 1991; Timmers, Fischer, & Manstead, 1998; Zillmann, Weaver, Mundorf, & Aust, 1986). However, these measures did not reflect a broad range of possible responses and did not include items measuring behavioural responses. Therefore, we performed a pilot study in which 32 first-year psychology students read six vignettes describing a meeting with a crying person or a non-crying person. Using open-ended responses, they indicated how they believed they would react and feel in the situations and how they would judge the other person. These open-ended responses were systematically categorised and the items that represented the categories best were used in the present study.

Anticipated person perception. The participants were asked the following question: "What would you think of the depicted person? To what extent would the following characteristics describe this person?" Response alternatives were the following 12 bipolar dimensions, each of which had to be rated on a 1–10 rating scale: pitiable-not pitiable, clever-stupid, not aggressive-aggressive, feminine-masculine.

line, strange-normal, insecure-secure, stable-unstable, squeamish-not squeamish, nice-unpleasant, calm-nervous, sensitive-insensitive, and active-passive.

Anticipated emotional response. The participants additionally were asked to answer the following question: "How would you feel in the presence of the depicted person? To what extent would you experience the following emotions when you are alone in a room with this person?" The following 13 state indicators were rated on a 4-point rating scale varying from 1 (not at all) to 4 (very much): angry, startled, bored, touched, fearful, relaxed, aversion, astonished, normal, powerless, sad, happy, and uncomfortable.

Anticipated behavioural response. Finally, the participants were asked to answer the following question: "How would you react to the depicted person? To what extent would you be inclined to react in the following ways when you are alone in a room with this person?" The following 12 options, each of which were rated on a 4-point rating scale varying from 1 (certainly not) to 4 (certainly so), were presented: I try to comfort him/her, I avoid him/her, I am happy for him/her, I pay attention to him/her, I help him/her, I try to calm him/her down, I get angry with him/her, I have sympathy for him/her, I start to cry, I do nothing, I talk with him/her, and I ignore him/her.

Procedure

Participants were individually seated in soundproof cubicles. The four different sets of photos were randomly distributed among the participants while balancing the number of men and women that viewed each set. The photos appeared in a random order on the computer screen for 110 seconds and a beep and the number of each photo preceded its appearance. Participants were instructed to view each photo carefully and to report how they would judge the other person, how they themselves would feel in the presence of the person, and how they would react to the other person.

Statistical analyses

First, we averaged the ratings of males posing the same expression and the ratings of females posing the same expression. The ratings of the four different sets of photos were then collapsed into one dataset. In order to reduce the number of dependent variables, factor analyses were conducted on the three sets of dependent variables separately. Because we were the first to use the present dependent variables, no prior hypotheses about the factorial structure of the questionnaire items could be formulated. Therefore, an exploratory factor analysis was carried out on the matrix containing the item correlations computed over all combinations of subjects and ratings. In other words, a total of 104 (number of respondents) \times 8 (type of expression) \times 2 (sex of poser) = 1664 observations were available to compute the correlation between any two items in a scale. Subsequently, a principal axis factoring was carried out for each set of dependent variables, and the resulting solutions were orthogonally rotated by means of the Varimax procedure with Kaiser Normalisation implemented. Average scores were calculated for the found scales and these average scores served as dependent variables.

The appropriate statistical analyses for the present design would be multilevel regression analyses for mixed models. We have, however, decided to perform regular General Linear Model (GLM) repeated-measures analyses, because the results of such analyses are more straightforward and easy to interpret. The main problem with GLM analyses is that the assumption of uncorrelated errors is violated, but by aggregating our data the number of dependent observations entering into the analyses was greatly reduced. Moreover, through our aggregation procedures the actual observations being entered into the analyses should be considerably more reliable than the individual data points. Therefore, we thought it is safe to assume that the distortions introduced by the nonindependence of errors would not alter our findings substantially.¹

Given the focus of the present research questions, the main analyses only included the ratings of crying, neutral, anger, and fear expressions. The GLM repeated-measures analyses were performed with type of expression (crying, neutral, anger, and fear) and sex of the poser as within-subject factors, and sex of the participant as a between-subject factor. The probability values were adjusted using the Greenhouse-Geisser procedure. If the main effect of type of expression was significant, post-hoc comparisons were applied to determine whether the means for crying expressions differed from the means for any of the other three facial expressions. Using the Bonferroni correction, the significance level for these post hoc comparisons was set on $p < .01$.

RESULTS

Factor analyses

Anticipated person perception. Factor analysis revealed three factors that together explained 48.8% of the variance. Unpleasant ($\alpha = .74$) was defined by the dimensions clever-stupid (0.70), nice-unpleasant (0.68), strange-normal (-0.66), squeamish-not squeamish (-0.58), and active-passive (0.30). Emotional Stable ($\alpha = .84$) included the dimensions insecure-secure (0.73), stable-unstable (-0.71), pitiable-not pitiable (0.67), and calm-nervous (-0.62). Finally, Aggressive ($\alpha = .51$) included the dimensions not aggressive-aggressive (0.70), sensitive-insensitive (0.56), and feminine-masculine (0.34).

Anticipated emotional response. Factor analyses yielded three factors that explained 53.4% of the variance. Defining items of Distress ($\alpha = .86$) were uncomfortable (0.74), startled (0.72), normal (-0.71), relaxed (-0.69), fearful (0.67), astonished (0.62), angry (0.42), and happy (-0.42). Sadness ($\alpha = .80$) was best characterised by the items touched (0.83), sad (0.80), and powerless (0.55). Last, the items aversion (0.66) and bored (0.64) constituted Aversion ($\alpha = .57$).

Anticipated behavioural response. Factor analysis yielded two factors, explaining 50.5% of the variance. First, Emotional Support ($\alpha = .82$) was defined by the items: I try to calm him/her down (0.92), I try to comfort him/her (0.85), I help him/her (0.77), I have sympathy for him/her (0.57), I start to cry (0.21). The items: I talk with

¹ This assumption was further strengthened by the results that revealed large effect sizes for type of expression. Most probably, our conclusions would not be very different using multilevel analyses.

him/her (-0.77), I avoid him/her (0.76), I ignore him/her (0.75), I pay attention to him/her (-0.63), I do nothing (0.48), I get angry with him/her (0.47), I am happy for him/her (-0.40) formed the scale Avoidance ($\alpha = .80$).

GLM repeated measures

The main objective of the present study was to find out whether the type of facial expression might influence how people respond to a person. Given this focus, we will only describe the results of the main effects of the type of expression and the results of the post hoc comparisons. The results of the effects of the sex of the poser and of the sex of the participant will not be considered.² The means of the dependent variables are represented as a function of the type of expression in Table 1.

Anticipated person perception. The type of expression significantly influenced the ratings of Unpleasant, $F = 23.46$, $p < .001$, *partial* $\eta^2 = .19$, Emotional Stable, $F = 174.48$, $p < .001$, *partial* $\eta^2 = .63$, and Aggressive, $F = 109.12$, $p < .001$, *partial* $\eta^2 = .52$. The post hoc comparisons demonstrated that posers of crying expressions were rated: (a) more unpleasant, less emotionally stable, and less aggressive than posers of neutral expressions, all $F_s > 39.95$, $ps < .001$, *partial* $\eta^2_s > .28$; (b) less emotionally stable and less aggressive than posers of anger expressions, both $F_s > 155.17$, $ps < .001$, *partial* $\eta^2_s > .60$; and (c) less emotionally stable and less aggressive than posers of fear expressions, both $F_s > 81.09$, $ps < .001$, *partial* $\eta^2_s > .44$.

Anticipated emotional response. The main effect of the type of expression was significant for the ratings of Distress, $F = 96.06$, $p < .001$, *partial* $\eta^2 = .49$, Sadness, $F = 222.61$, $p < .001$, *partial* $\eta^2 = .69$, and Aversion, $F = 24.99$, $p < .001$, *partial* $\eta^2 = .20$. Post hoc comparisons revealed that crying expressions elicited: (a) more distress, more sadness, and less aversion than neutral expressions, all $F_s > 34.55$, $ps < .001$, *partial* $\eta^2_s > .25$; (b) more sadness and less aversion than anger expressions, both $F_s > 71.99$, $ps < .001$, *partial* $\eta^2_s > .41$; and (c) more distress and more sadness than fear expressions, both $F_s > 23.00$, $ps < .001$, *partial* $\eta^2_s > .18$.

Anticipated behavioural response. The ratings of Emotional Support, $F = 184.61$, $p < .001$, *partial* $\eta^2 = .66$, and Avoidance, $F = 46.26$, $p < .001$, *partial* $\eta^2 = .33$, were both significantly influenced by the type of expression. The post hoc comparisons showed that participants tended to give more emotional support to and to display less avoidance behavior toward posers of crying expressions than to(ward): (a) posers of neutral expressions, both $F_s > 50.09$, $ps < .001$, *partial* $\eta^2_s > .35$; (b) posers of anger expressions, both $F_s > 140.94$, $ps < .001$, *partial* $\eta^2_s > .60$; and (c) posers of fear expressions, both $F_s > 18.15$, $ps < .001$, *partial* $\eta^2_s > .16$.

² Only some effects of the sex of the poser and of the sex of the participant were found to be statistically significant and these effects were very small compared to the effects of type of expression. Apparently, a particular facial expression elicits the same responses in men and in women, and regardless of whether a man or a woman made the expression.

TABLE 1
Means (and standard deviations) on the dependent variables as a function of type of expression

	<i>Crying</i>		<i>Neutral</i>		<i>Anger</i>		<i>Fear</i>	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Person perception								
Unpleasant	5.86	(0.80)	5.17	(0.96)	5.82	(0.82)	5.67	(0.85)
Emotional stable	3.39	(1.01)	6.41	(1.15)	5.24	(1.01)	4.58	(1.22)
Aggressive	3.22	(0.91)	5.07	(0.83)	5.34	(1.37)	4.14	(0.78)
Experienced Emotions								
Distress	2.33	(0.35)	1.79	(0.34)	2.30	(0.43)	2.16	(0.40)
Sadness	2.02	(0.49)	1.12	(0.21)	1.29	(0.31)	1.30	(0.37)
Aversion	1.38	(0.44)	1.73	(0.56)	1.73	(0.52)	1.47	(0.45)
Behavioural response								
Emotional support	2.54	(0.44)	1.53	(0.40)	1.77	(0.42)	2.00	(0.47)
Avoidance	2.08	(0.39)	2.38	(0.41)	2.54	(0.44)	2.24	(0.39)

DISCUSSION

In line with previous research (see introduction), the present results suggest that the facial expression of an individual codetermines how people perceive the person and how one might feel in the presence of an emotional person. Compared to posers of neutral, anger, and fear expressions, crying individuals were perceived as less emotionally stable and less aggressive. Observers also expected to feel sadder in the presence of crying people. These results are in accordance with the idea that crying people would be perceived as less dominant and more affiliative than angry people, and with our expectation that viewing crying faces would induce emotional contagion. Crying people also presumably elicit more approach behaviour than angry people (Frijda, 1997). Participants reported being inclined to emotionally support a crying person more and to avoid a crying person less than individuals expressing the other emotions. These results support the idea that crying facilitates attachment (Cornelius & Lubliner, 2003; Kottler & Montgomery, 2001; Nelson, 2005).

An interesting question is why people tend to support a crying person. A plausible answer is that people experience empathy for a crying individual and help him/her out of altruistic motives. According to Batson, O'Quin, Fultz, Vanderplas, and Isen (1983), however, it is not unlikely that egoistic motives, more precisely the reduction of personal distress, lie at the basis of the increased tendency to support criers. In the present study, participants mainly expected to feel sad and distressed in the presence of a crying person. Using vignettes, we found that people believe they would feel more uncomfortable and tense in the presence of a crying person than of a non-crying person (Hendriks, Croon, & Vingerhoets, 2005). These results would suggest that people mostly help a crying person for egoistic reasons. Cialdini and colleagues (Cialdini et al., 1987) have argued that feeling empathy for a suffering individual brings with it increased personal sadness but that it is the egoistic desire to relieve this sadness that motivates people to help.

A limitation of the present study and of previous research as well is that we did not examine the actual behavioural responses to emotional expressions in real life. Behaviour in real everyday life can probably only partly be predicted on the basis of the responses to viewing a photograph. One may argue that the present study mainly measured attitudes, socially desirable reactions, and stereotypes (Parkinson & Manstead, 1993). However, Ajzen and Fishbein (1980) suggest that these attitudes and subjective norms are important determinants of behaviour. We feel that the used methodology was adequate for the present purposes because measuring people's beliefs about their responses provides an important first step in generating hypotheses concerning actual behaviour in response to a crying person. Future experimental or observational studies should reveal whether crying people in real life indeed more likely receive emotional support.

In sum, the present study has provided insight into the kind of social reactions crying *might* elicit in real life. Future research should examine actual social reactions to crying and other facial expressions that are expressed in several contexts. Nonetheless, the present study suggested that crying is a communicative signal with a high potential to elicit empathy and emotional support. Our results indirectly support the idea that crying is an important attachment behaviour throughout life, not just during childhood, which is primarily meant and used to stimulate others to offer comfort and help (Bowlby, 1969; Nelson, 2005).

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