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Expert Commentary B

THE COMMUNICATION OF ANGER: BEYOND THE FACE

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Anger has garnered the theoretical and empirical attention of researchers for several decades (Berkowitz, 1990; Dollard, Miller, Doob, Mowrer, & Sears, 1939; Sternberg, Campos, & Emde, 1983). Researchers have focused on a variety of facets of anger such as its biological underpinnings (e.g. Adams, Gordon, Baird, Ambady, & Kleck, 2003) its cognitive appraisals (e.g., Lazarus, 1991), and its expression (e.g., Ekman, 1993); we have learned much about how anger operates in individuals' lives. Nevertheless, there are significant gaps in our knowledge about anger, especially as it relates to its expression. Researchers have viewed the expression of emotion in general, and anger specifically, as being synonymous with facial expression. In this brief article, we review evidence, some of it from our lab, indicating that anger is communicated by a number of other means in addition to facial displays.

From an evolutionary perspective, emotions – including anger – are adaptations to solve problems of social and physical survival and to achieve our goals (Barrett & Campos, 1987; Keltner & Gross, 1999). Anger, specifically, is thought to regulate and organize physiological and psychological processes related to eliminating obstructions to one's goals (Barrett & Campos, 1987; Lazarus, 1991; Lemerise & Dodge, 2000). Displays of anger can be used to change or disrupt the relation of oneself to the environment to overcome obstacles. For example, in response to having something stolen one may display anger toward the transgressor thereby communicating to him/her one's action tendency and potential future actions. Thus, emotional signals of anger regulate interpersonal behavior and help solve problems related to social life.

Functional accounts of emotion often stress the equifinality principle of emotional displays (Barrett & Campos, 1987; Frijda, 1986; Keltner & Gross, 1999). This principle refers

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to the idea that the same communicative outcome can be achieved via a number of different means. For example, the communication of anger may be communicated by facial displays, vocal displays or gestural displays. From an evolutionary perspective, it is adaptive for organisms to have multiple means by which to communicate the same emotion. The emotion's 'signal' can be duplicated via multiple channels thereby more strongly regulating the relationship between the organism and the environment (Partan & Marler, 1999).

Given the functional importance of multimodal emotional communication, it is surprising that researchers have focused almost solely on the face (Ekman, 1993). A meta-analysis of 70 studies indicated that facial displays of anger are decoded across cultures at about a 65% accuracy rate using forced-choice methods (Elfenbein & Ambady, 2002) Other means that communicate anger likely increase the accuracy with which people decode anger. Below, we review briefly the evidence for the communication of anger via the voice, gesture, and touch.

THE VOICE

Although vocal communication of emotion has received relatively little empirical attention compared to the face, a significant body of data indicates that the voice reliably communicates anger (Scherer, 1986). In a typical study of vocal communication, actors and actresses vocalize target emotions such as anger, fear and happiness. Of interest, is how accurately participants choose the correct target emotion from a list of emotion terms (i.e., forced-choice methodology). A meta-analysis indicated that vocal displays of anger are decoded across cultures at about a 64% accuracy rate using forced-choice methods (Elfenbein & Ambady, 2002). Another meta-analysis examining the acoustic cues of emotions suggests that anger is communicated by the following: (a) fast speech rate/tempo, (b) high voice intensity/sound level, (c) much high-frequency energy, (d) high F0/pitch level, (e) rising F0/pitch contour, and (f) fast voice onsets/tone attacks (Juslin & Laukka, 2003). Taken together, the data indicate that the voice reliably communicates anger and does so in an acoustically discrete fashion.

GESTURE

The communication of anger though gesture, like the voice, has attracted little attention from researchers. Unlike the voice, however, the communication of anger through gesture can be imparted a number of different ways. For example, research indicates that anger can be communicated through dance, gait, body posture, and hand movements – all forms of gestural communication (Camurri, Lagerlöf, &Volpe 2003; Montepare, Goldstein, & Clausen, 1987; Wallbott, 1998). In a typical study assessing communication via gesture, trained actors dramatize various emotions and participants then identify the emotion conveyed by the gestures and without the aid of vocal inflections and facial cues. Some studies have found common movements that communicate anger via gesture. For example, Wallbott (1998), who focused on posture and movement, found that anger is communicated by: (a) lifting the shoulders, (b) lateralized hand and arm movements, (c) arms stretched out in front, (d) opening and closing of hands, and (c) high expansiveness/energy/power. However, it is

important to note that these gestures do not solely denote anger. They are also common cues that indicate all "active emotions" such as elated joy.

The results of the Wallbott (1998) study indicate that there is a set of distinct gesture cues that convey anger. These gestures, in addition to being uniformly employed seem to be universally understood as well. This particular study found that participants were able to successfully classify the emotions conveyed by gestures with an average of about 66% accuracy. A cross cultural comparison found that different cultures were equally able to identify anger communicated through the same gestures (Sogon & Masutani, 1989). In this study Japanese participants were able to correctly identify 21 scenes of anger out of the 28 that were presented while American participants successfully identified 20 of the 28 anger scenes (Sogon & Masutani, 1989). Although there is substantial room to continue to explore this area, the current research gives strong support to the notion that anger can be universally conveyed and understood through various types of gestures.

TOUCH

To date, only two studies have been conducted investigating how touch can communicate distinct emotions (Hertenstein, Keltner, & App, 2006). In this research, an encoder (or toucher) and decoder (or touchee) sat at a table, separated by an opaque black curtain, which prevented all communication other than touch. The encoder was given a list of 12 emotion words in a random sequence and asked to make contact with the decoder's arm from elbow to the hand to signal each emotion, using any form of touch. The decoder could not see any part of the touch because his or her arm was positioned on the encoder's side of the curtain, and had the simple task of trying to select, from the list of words presented to the encoder, which emotion had been communicated. This research paradigm was used with a sample of U.S. students (study 1) as well as students in Spain (study 2).

In both studies, six different emotions were communicated by the participants at greater-than-chance levels, including anger. In fact, anger was communicated accurately 57% of the time in the U.S. and 59% of the time in Spain (chance was about 8%). Encoders' tactile behaviors were analyzed on a second-by-second basis by independent judges and rated on a variety of tactile qualities such as pulling, tugging, and hitting. Participants asked to communicate anger via touch generally employed strong intensity touch for an average of 4.5 seconds. Hitting, squeezing, and trembling constituted the most common qualities of touch used by encoders in Study 1 to communicate anger. Prior to these studies, most researches thought touch only communicated the hedonic tone of emotion or could serve only as an intensifier of emotional displays from the face (e.g., Hertenstein & Campos, 2001). Our results indicate that, in fact, touch communicates distinct emotions. More specifically, touch communicates anger very well, even better than fear, gratitude, and love.

UNADDRESSED ISSUES

In this article, we have reviewed the literature indicating that anger is communicated not only by the face, but by the voice, gesture and touch. Highlighting the multimodal nature of

the communication of anger raises a number of important questions that warrant future investigation. First, to what degree do redundant channels of anger strengthen the signal of anger displays? That is, how much more powerfully do redundant signals of anger impact the perceiver compared to unimodal signals of anger?

Second, how does the context of a situation influence the modality that is employed to communicate anger? How the target of an emotional signal is positioned in relation to the emoter may influence which modality is employed to communicate anger. One may hypothesize, for example, that if the emoter is turned away from the target of the signal, the emoter may be more likely to signal anger via the voice than the face. Deriving theoretical predictions about how context influences which modality is employed to communicate emotions and then testing these predictions would be a fruitful area of investigation.

Finally, the brief review above highlights the dearth of investigation on the communication of anger in the voice, and especially in gesture and touch. The overwhelming majority of studies conducted on the communication of anger has focused on the face. A significant body of literature over the last two decades – although paling in comparison to the face – has accrued on the communication of anger via the voice. However, only a handful of studies of gesture and only two studies of touch have been conducted on the communication of anger. To have a fuller understanding of the communication of anger, researchers would benefit from attending more to the voice, gesture and touch and going beyond the face.

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