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Sad or fearful? The influence of body posture on adults' and children's perception of facial displays of emotion

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ABSTRACT

The current research investigated the influence of body posture on adults' and children's perception of facial displays of emotion. In each of two experiments, participants categorized facial expressions that were presented on a body posture that was congruent (e.g., a sad face on a body posing sadness) or incongruent (e.g., a sad face on a body posing fear). Adults and 8-year-olds made more errors and had longer reaction times on incongruent trials than on congruent trials when judging sad versus fearful facial expressions, an effect that was larger in 8-year-olds. The congruency effect was reduced when faces and bodies were misaligned, providing some evidence for holistic processing. Neither adults nor 8-year-olds were affected by congruency when judging sad versus happy expressions. Evidence that congruency effects vary with age and with similarity of emotional expressions is consistent with dimensional theories and "emotional seed" models of emotion perception.

Introduction

Emotional expressions provide important cues about the environment (e.g., a fearful face indicates potential danger) and about whether to approach or avoid other people. Emotional facial expressions can be used to mask felt emotions (e.g., Ekman & Friesen, 1982, see also Gosselin, Warren, & Diotte, 2002; Hess, Beaupre, & Cheung, 2003) for either prosocial reasons (e.g., smiling after receiving an unwanted gift (Gosselin et al., 2002)) or more sinister reasons (as in numerous fairy tales and folk stories). The ability to recognize various displays of emotion (e.g., facial expressions, tone of voice, body posture) is an important skill.

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Although infants can discriminate among some emotions depicted in the human face (e.g., Barrera & Maurer, 1981; Caron, Caron, & Myers, 1982), the ability to accurately recognize prototypical facial displays of emotion continues to develop until approximately 10 years of age (e.g., Camras, 1980; Camras & Allison, 1985; Durand, Gallay, Seigneuric, Robichon, & Baudouin, 2007). The time course over which children achieve adult-like proficiency varies across emotions, with few age-related differences for happy facial expressions and gradual improvement for other expressions (e.g., Camras & Allison, 1985; Durand et al., 2007; Kolb, Wilson, & Taylor, 1992; Vicari, Reilly, Pasqualetti, Vizzotto, & Caltagrione, 2000; Widen & Russell, 2003). However, the literature on children's perception of facial displays of emotion suffers the same limitation as the literature investigating adults' perception (reviewed in Aviezer, Hassin, Bentin, and Trope 2008); in almost every study, faces have been presented in isolation without the contextual information (e.g., body posture, background scenes) that accompanies facial expressions encountered in everyday social interactions (see Meeren, van Heijnsbergen, & de Gelder, 2005; Righart & de Gelder, 2008a; Righart & de Gelder, 2008b).

The practice of presenting faces in isolation likely reflects the influence of the discrete category approach to emotion perception. This theoretical approach assumes that emotions are perceived categorically (Ekman, 1970; Izard, 1992), with six basic emotions recognized universally: happiness, sadness, anger, fear, disgust, and surprise. Theories emphasizing the perception of emotions as discrete categories are consistent with neural correlates of emotion perception (e.g., Calder et al., 1996; Gray, Young, Barker, Curtis, & Gibson, 1997). According to these theories, facial displays reliably reflect the target's emotional state, rendering other cues to emotion irrelevant or misleading.

In contrast, dimensional theories of emotion perception assume that only three pieces of information can be read directly from facial displays of emotion: quasi-physical information (e.g., whether the mouth is turned up or down) and two emotional dimensions—level of arousal and valence (i.e., whether the target's current emotional state is pleasant or unpleasant) (see Fig. 1) (Carroll & Russell, 1996). Emotional categories are subsequently extracted based on the underlying dimensions (Abelson & Sermat, 1962; Bullock & Russell, 1984; Schlosberg, 1952). For example, a face displaying low arousal and negative valence is likely to be perceived as expressing sadness. These dimensions are orthogonal and form a circumplex such that emotions are organized in a circular pattern; proximity on the circumplex determines the similarity between any two emotions. Adults' similarity judgments and categorization errors reflect the proximity of emotions in the circumplex model (e.g., Gao, Maurer, & Nishimura, 2010; Susskind, Littlewort, Bartlett, Movellan, & Anderson, 2007; see also Vieillard & Guidetti, 2009). Dimensional models predict that context will influence the perception of facial expressions when the emotion conveyed by the context is similar in arousal and/or valence to the emotion displayed in the face. For example, a context depicting disgust will influence one's perception of a face displaying anger more than a face displaying happiness (Carroll & Russell, 1997).

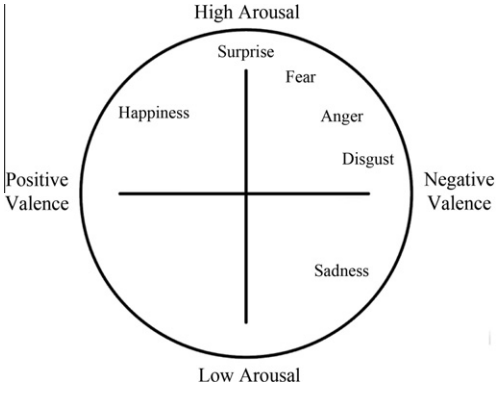

Fig. 1. The circumplex model: A schematic representation of the similarity between the prototypical basic emotions based on the underlying continuous dimensions of arousal (vertical) and valence (horizontal). The locations of the emotions are predicted by dimensional theories of emotions (e.g., Russell 1997; see Aviezer, Hassin, Bentin, & Trope, 2008).