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Brief Report

Pick on someone your own size: The detection of threatening facial expressions posed by both child and adult models



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ABSTRACT

For decades, researchers have documented a bias for the rapid detection of angry faces in adult, child, and even infant participants. However, despite the age of the participant, the facial stimuli used in all of these experiments were schematic drawings or photographs of adult faces. The current research is the first to examine the detection of both child and adult emotional facial expressions. In our study, 3- to 5-year-old children and adults detected angry, sad, and happy faces among neutral distracters. The depicted faces were of adults or of other children. As in previous work, children detected angry faces more quickly than happy and neutral faces overall, and they tended to detect the faces of other children more quickly than the faces of adults. Adults also detected angry faces more quickly than happy and sad faces even when the faces depicted child models. The results are discussed in terms of theoretical implications for the development of a bias for threat in detection.

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Introduction

Faces are an important social signal for humans, indicating when a situation is safe and when it is potentially dangerous. The propensity for the rapid detection of threatening or angry facial expressions has been an important topic of research for decades. In countless studies, researchers have reported that adults detect angry faces more quickly than a variety of other facial expressions (e.g., Calvo, Avero, & Lundqvist, 2006; Esteves, 1999; Tipples, Atkinson, & Young, 2002; Williams, Moss,

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Bradshaw, & Mattingly, 2005). Recently, researchers have begun to extend these findings to children and infants, reporting that 5-year-olds also detect angry faces more quickly than happy, neutral, and sad faces (LoBue, 2009) and that even 9- to 12-month-old infants turn more quickly to look at angry faces than at happy faces (LoBue & DeLoache, 2010).

Despite numerous studies demonstrating an advantage for threatening faces in detection, evidence about what drives the rapid detection of threatening faces is more contentious. Many researchers have proposed that threat relevance, or the *threatening message* produced by these stimuli, is what facilitates detection (Eastwood & Smilek, 2005; Eastwood, Smilek, & Merikle, 2001, 2003; Lipp & Derakshan, 2005; Lipp & Waters, 2007; Lundqvist & Öhman, 2005; Öhman, Lundqvist, & Esteves, 2001). In support of this hypothesis, researchers have shown that the more aversive adults rate threatening stimuli, the more quickly they detect them (Beaver, Mogg, & Bradley, 2005; Lundqvist & Öhman, 2005). Furthermore, when threatening faces are inverted, which generally results in impaired face processing, they are no longer detected more quickly than happy faces (Eastwood et al., 2001; Fenske & Eastwood, 2003; Fox et al., 2000).

However, given that even 9- to 12-month-old infants detect angry faces more quickly than happy faces, it is possible that understanding the threatening message posed by angry faces is not necessary for their rapid detection. Thus, an alternative hypothesis for why threatening stimuli are detected so quickly is that *low-level perceptual features* of the stimuli drive detection (Becker, Horstmann, & Remington, 2011; Horstmann, 2009; Horstmann, Borgstedt, & Heumann, 2006; LoBue, 2013b; LoBue, Rakison, & DeLoache, 2010). For example, some researchers have shown that specific geometric shapes, such as the “V”-shaped brow characteristic of angry faces, are sufficient in eliciting rapid detection in the absence of any threatening or negative valence (Larson, Aronoff, & Stearns, 2007; LoBue & DeLoache, 2011; LoBue & Larson, 2010). Furthermore, when presenting participants with these features in non-face-like configurations, there is still an advantage in detection (Coelho, Cloete, & Wallis, 2011; Horstmann et al., 2006).

Importantly, in all of these studies, the stimuli were schematic faces or photographs of real faces taken from standardized emotional facial expression sets such as the Ekman face set (Ekman & Friesen, 1976) and the NimStim set (Tottenham et al., 2009). Such sets contain photographs of adults posing for various emotional facial expressions. No research to date has examined the detection of *children's facial expressions*. This is important because even the work with child and infant participants described above uses stimulus sets of adult faces. Developmentally, it is possible that children might have more difficulty in identifying the facial expressions of adults than of children their own age. Indeed, researchers have reported that children recognize faces the most accurately when they are within 2 years of their own age (Hills & Lewis, 2011). However, until recently, a standardized set of child facial expressions was not available. The current study examines the detection of child angry, happy, and sad facial expressions using a new stimulus set—the Child Affective Facial Expression (CAFE) set. CAFE is a racially and ethnically diverse set of photographs of 4- to 6-year-old children posing for angry, disgusted, fearful, happy, neutral, sad, and surprised facial expressions (LoBue & Thrasher, 2013).

Here we examined the detection of both child and adult emotional facial expressions. The findings have theoretical implications for what drives the detection of threatening faces. Although an angry child's face has the same features as an angry adult's face, these faces do not necessarily carry the same meaning. In the current research, 3- to 5-year-old children and adults were asked to detect angry, sad, and happy faces among neutral distracters. In half of the conditions, they detected faces of 4- to 6-year-old children from the CAFE set. In the other half, they detected adult facial expressions from the NimStim set. If the threatening message produced by adult angry faces drives their rapid detection, children posing angry faces might not produce the same results in adult participants because an angry 5-year-old is likely not very threatening to adults. Conversely, for child participants, an angry 5-year-old and an angry adult may both attract attention equally because both faces could constitute an imminent threat. Alternatively, if specific features of threatening faces such as an angry face's V-shaped brow drive their rapid detection, angry faces should be detected more quickly than other facial expressions regardless of whether the model is a child or an adult.

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