

Discrete Emotions in Infancy: Perception without Production?

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Abstract

Camras and Shutter review evidence suggesting that infants' facial expressions do not represent discrete emotions and cannot easily be matched to the facial expressions of adults. This raises the important question of whether infants have a notion about the meanings of discrete emotions at all. The authors do not discuss whether infants are sensitive to discrete emotional expressions when *perceiving* others. In our commentary we discuss evidence for the perception of discrete emotional facial expressions in infancy.

Keywords

development, emotional expressions, infancy, neural correlates, social cognition

In their review article Camras and Shutter (2010) argue that evidence supporting the notion of discrete emotional facial expressions in infancy is very limited. Though infants display facial expressions from very early on, attempts to match these to adult expressions by using facial coding systems did not yield conclusive evidence for discrete emotional facial expressions in infancy. The relationship between infants' expressions and emotion eliciting contexts is also relatively unclear.

This raises the important question of whether infants have any notion about the meaning of discrete emotions at all. Does the fact that infants do not express emotions in the way that adults do imply that their sensations of emotions are different? A related and more testable question is whether infants *perceive* differential emotional expressions in others. Research on emotion perception in infants has shown that infants are able to discriminate and categorize most basic emotional facial expressions by 7 months of age (see Leppänen & Nelson, 2006, for a review). However, discrimination and

categorization may be based on purely perceptual comparisons and do not necessarily imply an understanding of the emotional meaning or valence of an expression. Some evidence for differential behavioral reactions to perceived emotional expressions stems from studies on social referencing in infancy. Social referencing implies (1) searching for emotional information in a novel or ambiguous situation, (2) referring the emotional expression to the respective situation, object or person; and (3) adjusting behavior in accordance with the emotional expression. For instance, by the end of their first year infants' exploration of a novel object is modulated by the emotional expression another person directs toward that object (e.g., Moses, Baldwin, Rosicky, & Tidball, 2001; Mumme & Fernald, 2003; Hertenstein & Campos, 2004). Interestingly, negative expressions seem to provide the stronger behavioral cues compared to positive expressions (see Vaish, Grossmann, & Woodward, 2008). However, in social referencing studies it is very difficult to distinguish between responses to different emotional expressions of the same valence (e.g., anger, fear, and disgust). Thus, it might be that infants in the first year merely have a notion of the positive versus negative valence of different emotions. This would concord with the observation that infants' happy expressions are relatively consistently differentiated from negative expressions using facial coding systems, but that the differentiation between negative expressions seems to be more difficult.

However, there is some evidence that 4-month-old infants respond differently to discrete emotional expressions in a peek-a-boo paradigm (Montague & Walker-Andrews, 2001), suggesting that infants do catch more of an emotional expression than just the valence. In an ambiguous teasing paradigm infants by 7 months have been shown to use emotional expressions to disambiguate the actions of an adult (Striano & Vaish, 2006). Furthermore, infants show differential neural responses

to the same emotional expressions depending on the social context. For instance, 7-month-olds show an increased brain response if an angry face is directing eye gaze towards them compared to an angry face averting gaze to the side, while no such effect was found for fearful faces (Hoehl & Striano, 2008). This suggests that infants are sensitive to the immediacy of threat signaled by an angry face as indicated by gaze direction. Furthermore, 7-month-olds' processing of a fearful face is affected by the presence or absence of a concrete referent of the emotional expression (Hoehl, Palumbo, Heinisch, & Striano, 2008). Infants show an increased attention response if a fearful face directs gaze toward an object in the environment compared to a fearful face without a clear referent. Thus, the neural processing of two negative emotional expressions is specifically affected by the social context in which the expressions are perceived. This speaks against the notion that infants differentially respond to emotional expressions merely based on their overall valence.

To conclude, there is an interesting discrepancy between infants' lack of discrete emotional facial expressions and their ability to perceive and react to discrete emotional expressions of others. This suggests that the development of expressing and perceiving emotional expressions may not be closely linked in infancy. However, more studies on the perception and recognition of discrete expressions in infancy are clearly warranted in order to understand early emotional development.

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