Infants' Categorization of Dynamic and Static Facial Expressions

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Abstract
This experiment compares 8-month-old infants' categorization of dynamic and static naturalistic emotional expressions. Most studies of facial expression categorization have presented infants with static photographs of exaggerated expressions, reporting that 7-month-olds categorize expression contrasts such as happy and fearful, but not happy and sad. However, it is important to study infants' processing of dynamic faces since motion provides unique information for face processing and more closely mimics the expressions infants experience in their daily interactions.

Infants' categorization of happy and disgust facial expressions was assessed. The stimuli are a digital video of faces displaying dynamic happy or disgust expressions and static expression images edited from the videos. During familiarization, infants (N=34; M age=55 days; SD=15 days) were presented with a sequence of these different facial faces displaying either happy or disgust until fixation on 3 consecutive trials decreased 50% below the first three trials. Infants were then shown 2 novel faces displaying the familiarization expression (within-category test trials). Following 2 novel faces displaying a novel expression (between-category test trials).

The results provide no indication that motion aids 8-month-olds' categorization of disgust and happy expressions. Post hoc comparisons reveal that infants increase fixation for the first novel face following habituation, indicating that they encode identity information for the three habituation faces. Additionally, infants increase looking to happy following habituation to disgust, but do not increase looking when disgust follows happy. These results have implications for understanding how infants process two types of information conveyed by faces, cues for identity and emotional expressions, both important for social communicative development.

Introduction
Infants' categorization of emotion
- Infants 6-7 months of age categorize emotional expressions in static faces (Newell, 1995).
- Fear vs. sad.
- Happy vs. anger.
- Fear vs. happy (Benson & Ankeley, 1992).
- But categorization is often based on salient features. NOT configurations or affect.
- Facial processing (Leder, 1991).
- But categorization is often based on salient features. NOT configurations or affect.
- Facial expression processing (Leder, 1991).
- Infants also discriminate emotional expressions given dynamic multimodal stimuli.
- Dynamic multimodal stimuli (Hassan-Katman & Walker-Arends, 2001).
- Lasts for 2.5 years (Bowers & Rabbitt, 2001).
- Role of motion in visual perception
- Motion aids infants' visual perception of object properties.
- Moving vs. static images (Kellen & Spelke, 1992).
- Motion enhances contour perception (Okada & Yamagishi, 2003).

Motion affects adults' perception of faces
- Motion can be useful for recognizing familiar faces.
- Facial motion (Pace & Smith, 2000).
- Facial expression (Leder, 2003).

Results
Procedure
- Habituation Paradigm
- Series of 3 faces repeated during habituation
- Habitation criterion: 3 consecutive trials decreased 50% below the first 3 trials of habituation
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- (Habitation criterion: 3 consecutive trials decreased 50% below the first 3 trials of habituation)
- Four Test Trials
- Within-Category test trials: 2 novel faces portraying the SAME facial expression
- Between-Category test trials: 2 novel faces portraying DIFFERENT expressions

Post Hoc Analysis
- Dynamic group detected first happy test face (T1); static group did not
- Neither group increased looking to disgust test faces (T3, T4).
- Both dynamic and static groups increased looking to happy test faces (T3, T4).

Discussion
- Dynamic presentation of facial affect did not facilitate categorization for either disgust or happy expressions, although static face data collection is still ongoing.
- Perhaps infants at this age are processing the information common to both dynamic and static expressions rather than focusing on the properties specific to dynamic faces. A second hypothesis is that motion is more helpful when faces are familiar. This is consistent with adult recognition literature (Roach et al., 2003) as well as Hassan-Katman & Walker-Arends (2001) report that young infants discriminate facial expressions rather than those of familiar faces.
- Infants who were habituated to disgust faces did not increase looking time to the happy test faces.
- Infants who were habituated to happy faces did not increase looking time to the disgust test faces. This may be explained by the infants' disinterest in a facial expression that conveys negative affect following exposure to stimuli stimulating positive affect.

Future Goals
- Are infants more likely to categorize emotions when shown larger numbers of faces in random order during habituation?
- Co-occur with 10-month-olds categorize happy and disgust emotions?
- Lehmann reported that 10-month-olds process affect rather than salient features of emotions (2001).

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