Six-month-old Infants’ Scanning of Meaningfully Distinct Infant-Directed Faces: Effects of Valence
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Background
Adults speak infant-directed (ID) speech to infants with different communicative intents throughout the first year of life (Fernald, 1989)
- Approving ID speech: “Good girl”, rising-falling pitch, higher Fo
- Comforting ID speech: “Don’t cry, baby.”, falling pitch, lower Fo
- 6-month-olds categorize auditory-only approving and comforting ID speech (Spence & Moore, 2003)

Adults portray ID faces when speaking ID speech (Chong et al., 2003)
- Adults distinguish ID faces based on communicative intent, by valence of featural characteristics (Shepard et al., 2012)
- Approving ID faces: widened “smiling” eyes, smiling mouth (positive)
- Comforting ID faces: saddened eyes, frowning mouth (negative)

Yet, it is unknown whether 6-month-olds detect differences in approving and comforting ID faces
- Adults’ visual attention to faces differs by valence
  - Eyes of sad faces, mouth of happy (Eisenbarth & Alpers, 2011)
- Negative emotions better detected in left visual field, positive emotions better detected in right visual field (Jansari et al., 2011)
- Valence hypothesis: right hemisphere processes negative emotions, left hemisphere processes positive (Silberman & Weingartner, 1986)

Research Questions
1. Do 6-month-olds attend differently to the eyes and mouth of ID faces that portray specific communicative intent?
   - Hypothesis: longer fixations to mouth than eyes of approving ID face, equal fixations to mouth and eyes of comforting ID face.
2. Does the valence hypothesis of hemispheric lateralization apply to 6-month-olds?

Method
- 6-month-olds (n = 40, M age = 181 days, 24 females, all Caucasian)
- Infants viewed stimuli on a Tobii T60 XL Eye-Tracker
  - One pre-test trial of an animated drum (not analyzed)
  - One 15-s silent video of a woman speaking ID speech
  - Each infant saw 1 of 6 women speaking either approving (n = 20) or comforting (n = 20) ID speech (between-subjects design)

Analyses
- AOIs defined for Eyes, Mouth, Viewer’s Left (VL) and Right (VR) Sides of Face
- Proportion of Total Looking Time (PTLT) to each AOI out of total looking time
- First 2.5 s analyzed to assess initial attention when orienting to a speaking face
  - (Oakes, 2011)

Results
- Repeated-measures ANOVA: PTLT to Eyes vs. Mouth by Condition
  - AOI x Condition: F(1, 38) = 4.12, p < .05, η2 = .10
  - Approving face: Mouth > Eyes (p < .02)
  - Comforting face: Mouth = Eyes (ns)
  - Comforting Eyes > Approving Eyes (p = .02)
  - Comforting Mouth = Approving Mouth (ns)

- Repeated-measures ANOVA: PTLT to VL vs. VR Side of Face by Condition
  - AOI x Condition: F(1, 38) = 9.46, p < .004, η2 = .20
  - Approving face: VL > VR (p < .001)
  - Approving VL > Comforting VL (p < .02)
  - Comforting VR > Approving VR (p < .001)

Discussion
- Infants attend differently to eyes and mouth of silent speech, approving and comforting ID faces
  - Greater attention to comforting eyes than approving eyes
  - Greater attention to approving mouth than approving eyes
  - Consistent with adults’ visual attention to sad eyes and happy mouth of faces (Eisenbarth & Alpers, 2011)
- Approving ID face may recruit infants’ attention to the smiling mouth, the sound source of spoken language.
  - Preferential attention to mouth at 6 months related to later expressive language skills (Young et al., 2009)
  - Function of ID speech in fostering language acquisition may differ by communicative intent

- Infants attend differently to viewer’s left (VL) and right (VR) sides of approving and comforting ID faces
  - Greater attention to VL than VR of approving face, specifically to VL side of mouth versus VR features
  - Greater attention to VR of comforting than approving face
  - Right side of face (VL) may be more expressive when portraying positive emotions, while left side of face (VR) may be more expressive when portraying negative emotions (see Powell & Schirillo, 2009, for review)
  - Infants’ lateralized processing contradicts adults’ according to valence hypothesis (Silberman & Weingartner, 1986)

Future work should assess the developmental trajectory of valence-specific visual attention to both ID and AD faces

References

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