

INTRODUCTION

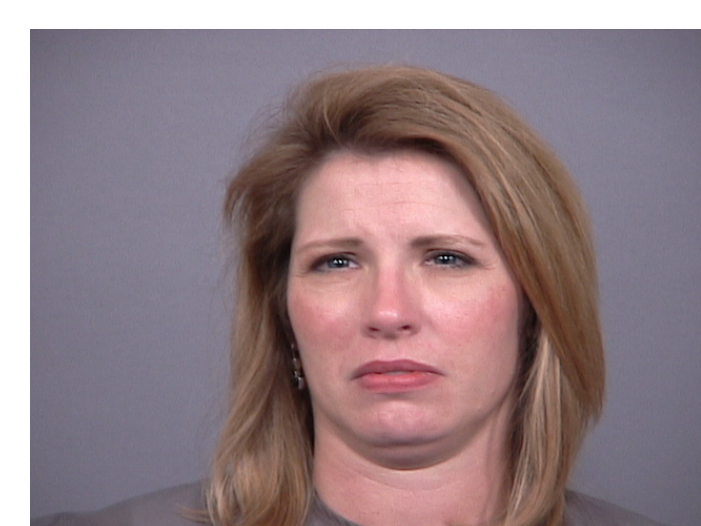
- Habituation procedures have found that infants as young as 3 months discriminate and categorize **static** facial emotional expressions (EE) of happy, sad, fear, anger.^{1,2,3}
- Studies exploring infants' categorization of **dynamic** EE found that 6-mo-olds did not categorize happy and disgust expressions portrayed by multiple faces, but 10-mo-olds did.^{6,7}
- Does eye-tracking data provide insight into facial features of EE that infants use and attend for discrimination of EE?
 - Consistent scanning patterns for dynamic stimuli may emerge later than for static stimuli.^{8,9}
- For static EE stimuli:
 - 4- to 7-mo-olds attend more to inner features of face when viewing non-threat EE compared to threat-related EE.⁴
 - 7-mo-olds attend more to eyes of happy, fearful, neutral faces but no differences in scanning between EE.⁵
- For dynamic EE:
 - 10-mo-olds looked equally at eyes and mouth for happy or sad dynamic EE *with audio* but more at mouths than eyes for fear.¹⁴

RESEARCH QUESTIONS & HYPOTHESES

- Do 6- and 10-mo-olds display distinct scanning patterns for happy and disgust **silent** facial expressions?
 - Distinct scanning for EE may emerge later in development.
 - May display longer fixation times to eyes of disgust faces than to happy eyes^{10,11}
- Does stimulus motion affect 6- and 10-mo-olds' scanning of faces?
 - 6- and 10-mo-olds may fixate longer on dynamic stimuli¹⁴
- 10-mo-olds may fixate on mouth more than 6-mo-olds^{4,12}

METHOD

- Infant sat on the lap of the caregiver in front of the Tobii T60 XL eye tracker approximately 60cm from the screen.
- Three different exemplars of each emotion for each motion type were created. Each infant assigned to one of four conditions and infants saw one of three exemplars (12 total stimuli):



Static Disgust 1



Static Disgust 2



Static Disgust 3

- 1 Static Happy
- 2 Static Disgust
- 3 Dynamic Happy
- 4 Dynamic Disgust

- Five-point calibration procedure followed by a 5-sec silent facial stimulus – Static/Dynamic, Happy/Disgust

Participants: 127 typically-developing infants:

63 six-month-olds (39 males)

64 ten-month-olds (32 males)

M age = 179 days, SD = 12 days

M age = 294 days, SD = 9 days

ANALYSES

- Defined three Areas of Interest (AOIs): Eyes, Mouth, Face



- Proportion of Total Looking time (PTLT):** total looking time to eyes or mouth out of total looking to the face

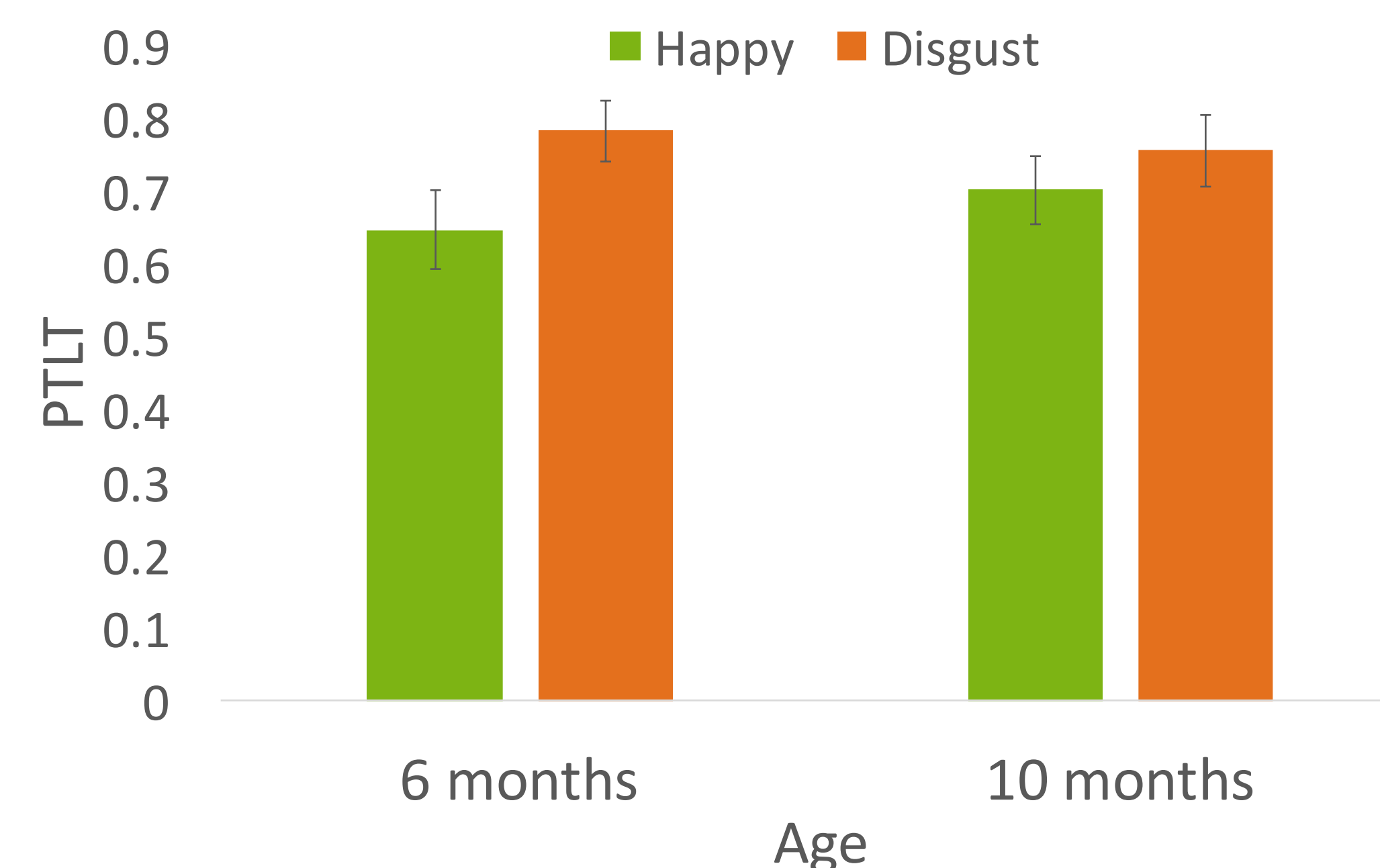
Mixed ANOVA:



RESULTS

Main Effect of Emotion:

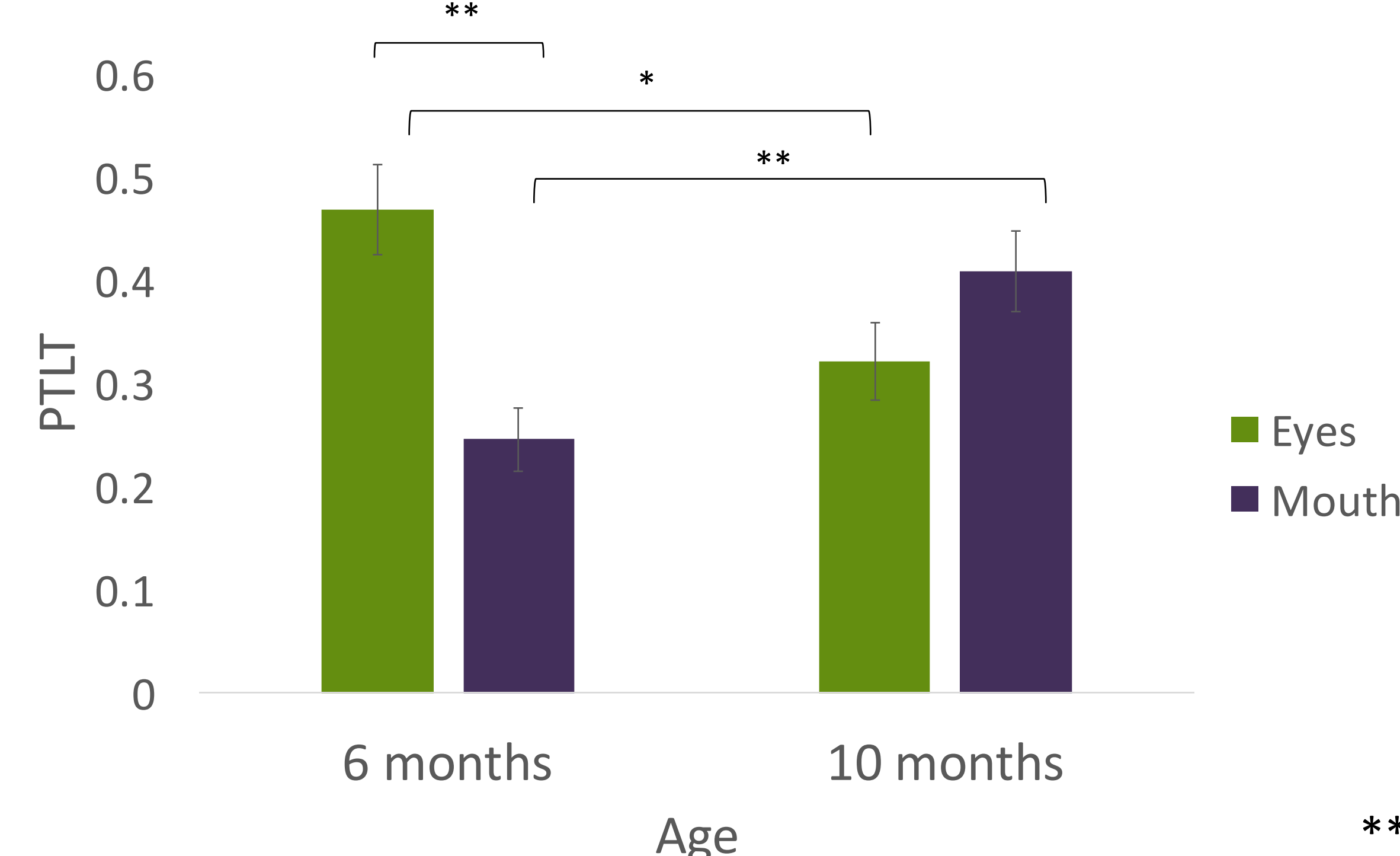
- 6-mo: **DISGUST** > **HAPPY** – $F(1, 60) = 3.87, p = .05, \eta_p^2 = .03$
- 10-mo: NS



AOI X Age Interaction:

$$F(1, 119) = 10.73, p = .002, \eta_p^2 = .08$$

- 6-mo **EYES** > 6-mo **MOUTH**
- 10-mo **EYES & 10-mo MOUTH** = NS
- 6-mo **EYES** > 10-mo **EYES**
- 10-mo **MOUTH** > 6-mo **MOUTH**



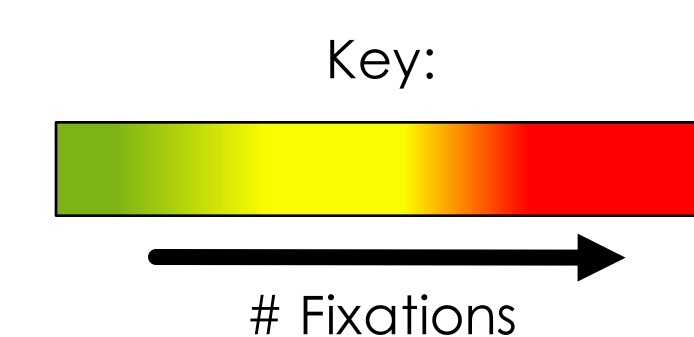
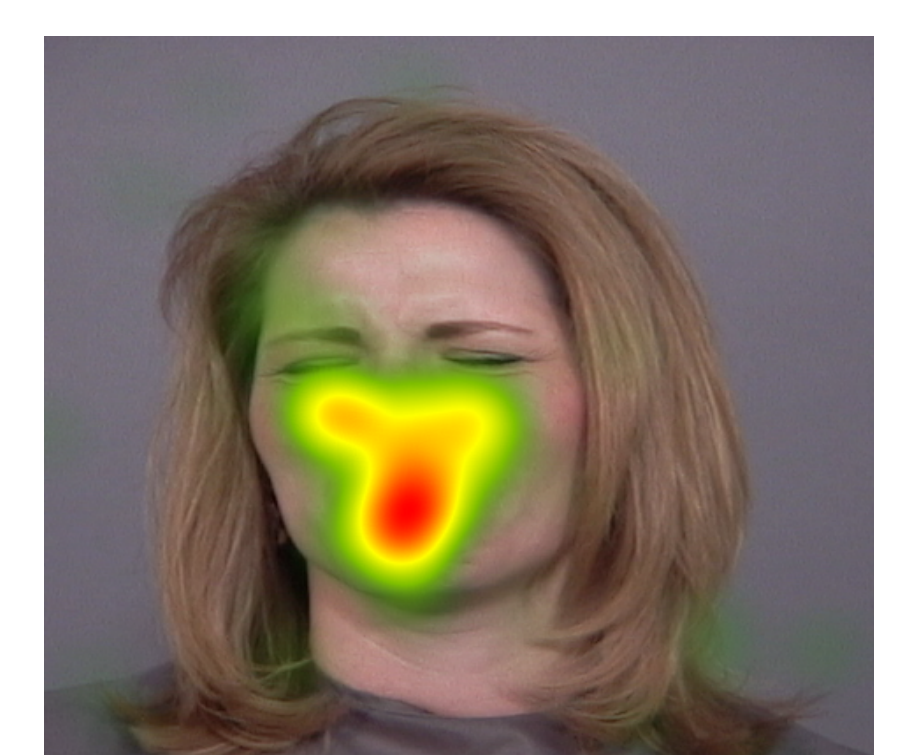
* $p \leq .01$
** $p \leq .001$

DISCUSSION

6-months



10-months



Tobii Studio 'Heatmaps' display infant fixations during stimulus presentation

- 6-mo-olds, but not 10-mo-olds, fixated longer on disgust than happy EE
 - May have perceived disgust display as more novel emotion
 - If disgust is novel for 6-mo-olds, may explain their failure to categorize in prior studies^{6,7}
- 6-mo-olds directed attention to eyes more than to mouths and attended more to eyes than 10-mo-olds.
- 10-mo-olds attended equally to eyes and mouths but directed attention to mouths more than 6-mo-olds.
 - Consistent with studies using audiovisual stimuli¹²
- No differences in scanning of dynamic and static silent faces
 - Other work found that 10-mo-olds fixate more to mouths of dynamic AV than static AV expressions¹⁴
 - These results combined suggest that the audio stream recruits attention to dynamic visual properties of faces

References & Acknowledgments

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