

# Environmental Modulators of Threat-Biased Attention in 7-Month-Old Infants

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## Background

- **Attention to and recognition of faces is biased in infancy:**
  - Biased attention to threat by ~7-months<sup>5</sup>
  - Biased attention/recognition to racial in-groups by ~9-months<sup>3</sup>
- **Attention biases impact on socioemotional functioning:**
  - Biased threat perception may contribute to the development and maintenance of anxiety disorders<sup>1</sup> and implicit racial biases<sup>6</sup>
  - In infancy, maternal wellness<sup>4</sup> and exposure to racial and ethnic diversity<sup>2</sup> shape face recognition and visual attention biases
- Little research has explored how experience shapes simultaneous biases for variant and invariant properties of faces

## Study Objective

Examine the impact of early social experiences (maternal wellness, exposure to racial/ethnic diversity) on 7-month-old infants' attention biases to variant (i.e., emotion) and invariant (i.e., racial/ethnic identity) features of faces

## Method

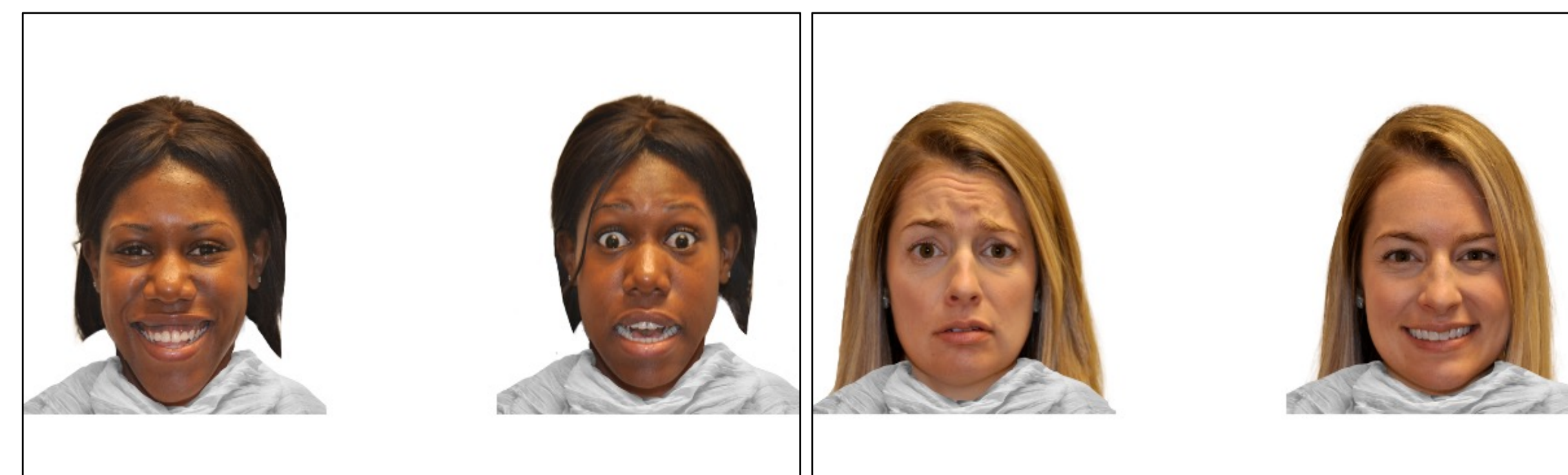
### Participants

- 51 mother-infant dyads
- Full-term, typically developing 7-month-olds

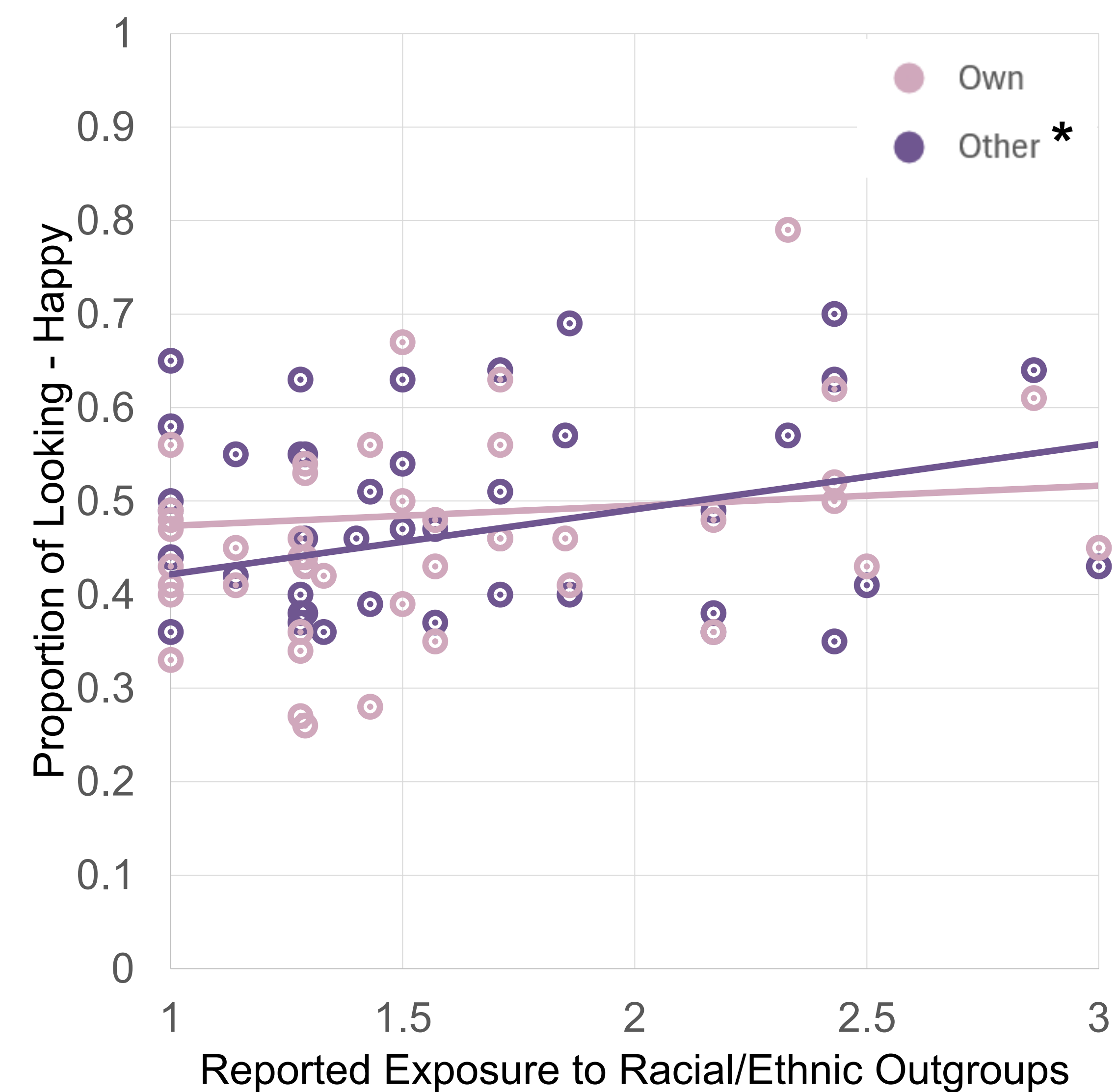
### Procedure

- Online, asynchronous data collection on Children Helping Science (CHS)
- Videotaped informed consent
- **Infant preferential looking trials:**
  - Side-by-side pairings of emotional expressions (sad, happy, fearful, angry) in own- and other-race blocks
  - Randomized trial order
  - Recorded via webcam for looking behavior
  - Videos coded by trained raters in Datavyu
- **Mother-completed measures:**
  - Household demographics, infant exposure to racial and ethnic diversity, and infant caregiving network questionnaires
  - Beck Depression-II and Anxiety Inventories

Infant Demographics		n	%
Gender	Female	25	49
Race/Ethnicity	White	29	56.9
	Black	1	2
	Latino/a/e	5	9.8
	East Asian	5	9.8
	Middle Eastern	1	2
	South Asian	2	3.9
	Bi- or multi-racial	8	15.6
		<b>M</b>	<b>SD</b>
Age (days)		217.22	13.88



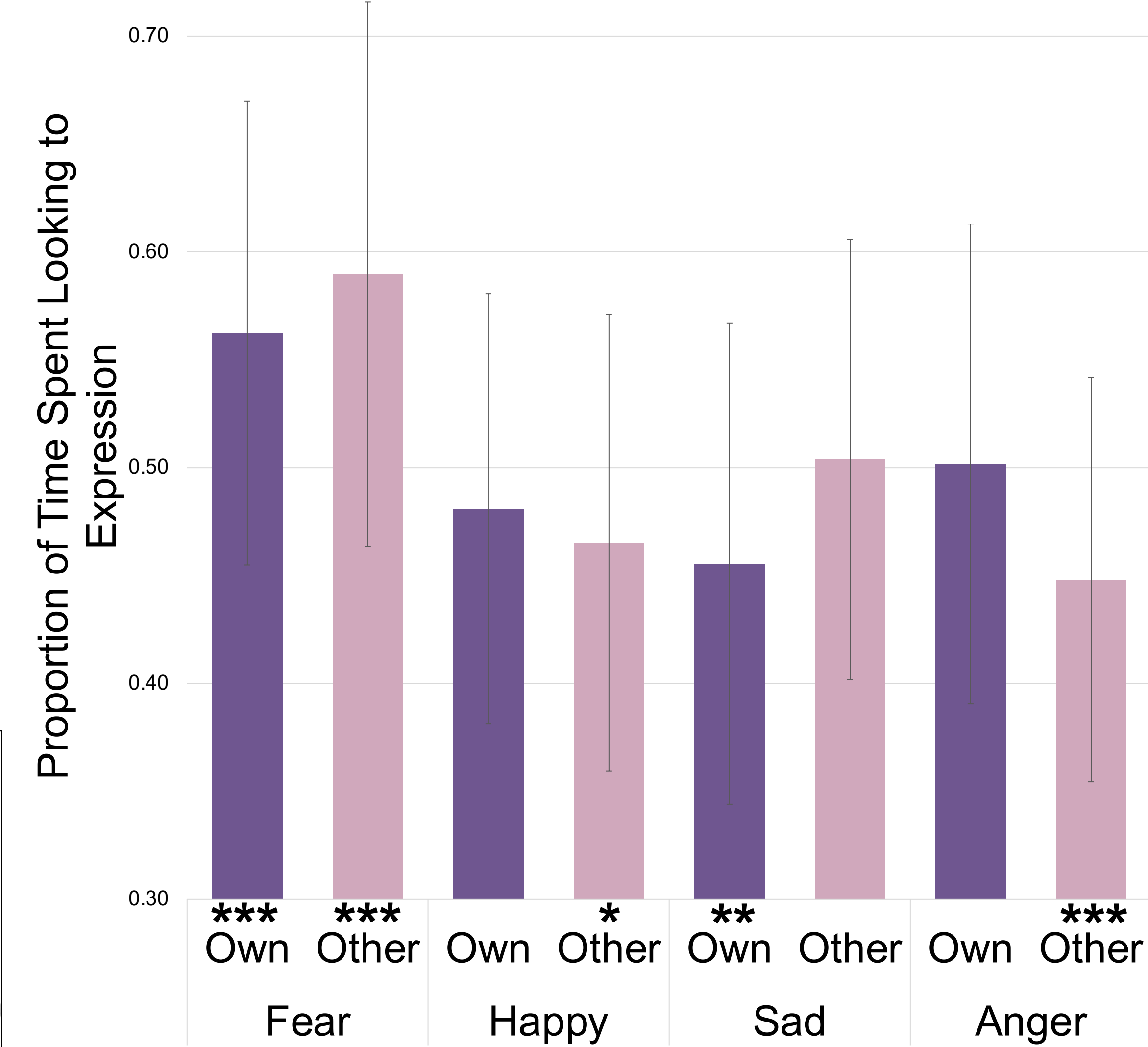
Example preferential looking trials - happy and fearful (left), sad and happy (right)



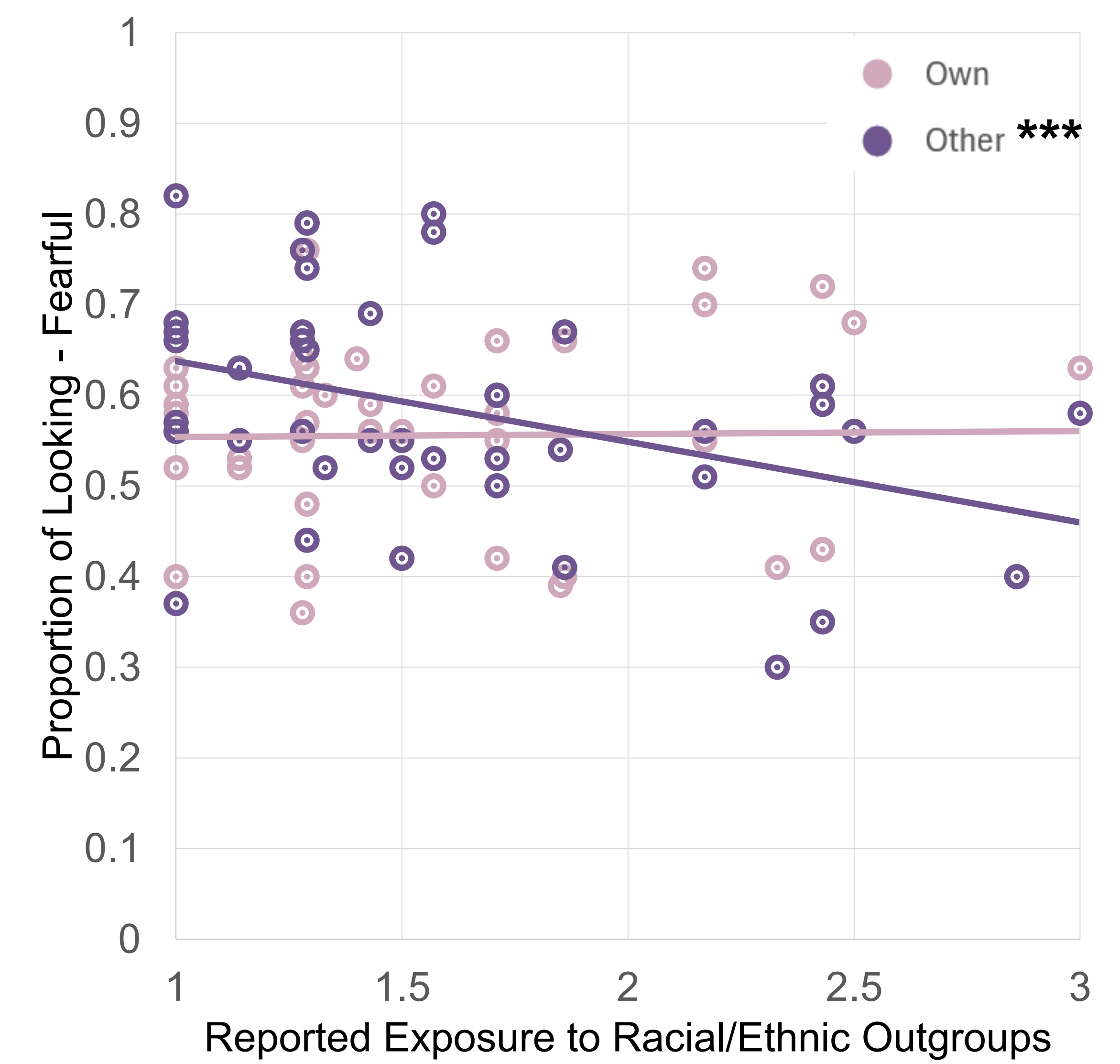
Correlations for infant exposure to racial/ethnic outgroup members and looking to happy (left) and fearful (right) expressions by race, \* $p < .05$ , \*\*\* $p < .001$

## References

1. Bar-Haim, Y., Lamy, D., Pergamin, L., Bakermans-Kranenburg, M. J., & Van Ijzendoorn, M. H. (2007). Threat-related attentional bias in anxious and nonanxious individuals: a meta-analytic study. *Psychological bulletin*, 133(1), 1.
2. Bar-Haim, Y., Ziv, T., Lamy, D., & Hodes, R. M. (2006). Nature and nurture in own-race face processing. *Psychological science*, 17(2), 159-163.
3. Kelly, D. J., Quinn, P. C., Slater, A. M., Lee, K., Ge, L., & Pascalis, O. (2007). The other-race effect develops during infancy: Evidence of perceptual narrowing. *Psychological science*, 18(12), 1084-1089.
4. Morales, S., Brown, K. M., Taber-Thomas, B. C., LoBue, V., Buss, K. A., & Pérez-Edgar, K. E. (2017). Maternal anxiety predicts attentional bias towards threat in infancy. *Emotion*, 17(5), 874.
5. Peltola, M. J., Leppänen, J. M., Mäki, S., & Hietanen, J. K. (2009). Emergence of enhanced attention to fearful faces between 5 and 7 months of age. *Social cognitive and affective neuroscience*, 4(2), 134-142.
6. Ruba, A. L., McMurty, R., Gaither, S. E., & Wilbourn, M. P. (2022). How White American children develop racial biases in emotion reasoning. *Affective Science*, 3(1), 21-33.



Proportions of looking to emotional expressions by race, \*indicates looking differs significantly from chance level of 50% - \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



## Results

**Repeated-measures ANOVA:** examined race and emotion on infant attention

- Emotion main effect,  $F(2.10, 90.47) = 9.24$ ,  $p < .001$ , reflected in fear bias
- Race\*emotion interaction,  $F(3, 129) = 3.62$ ,  $p = .015$ ; less looking to anger for other than own

**One-sample t-tests:** examined whether looking to each own- or other-race emotional expression differed from chance levels (50%)

- Fear: increased looking in own- ( $p < .001$ ) and other-race ( $p < .001$ ) trials
- Anger: decreased looking in other-race trials ( $p < .001$ )
- Happy: decreased looking in other-race trials ( $p = .015$ )
- Sad: decreased looking in own-race trials ( $p = .006$ )

**Correlations:** examined strength/direction of association between infant attention, BAI, BDI-II, and reported exposure to racial/ethnic diversity

- Exposure to racial/ethnic outgroups – increased looking to other happy, decreased to other fear

## Discussion

- Replicates fear bias in 7-month-olds using online study paradigm
- **Simultaneous attention biases for variant and invariant properties of faces:**
  - Attention bias for fear was identity-invariant, anger was engaged with less only when viewing racial outgroup members
  - Emerging associative biases for positive/negative expressions by racial in- and out-group categorizations
  - Experience-dependent shaping of attention-biases potentially mitigated through exposure to racial/ethnic diversity
- No impact of maternal wellness on attention
- Threat highly salient at 7-months
- Community-based sample with low reported BAI and BDI-II scores
- Project ongoing with longitudinal data collection at 12-months infant age

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