

## INTRODUCTION

- Habituation procedures have found that infants at 3-mo-old categorize and discriminate various facial emotions when presented as static images.<sup>1,2,3,4,5</sup>
- Few studies have used eye-tracking to investigate infants' scanning of emotional expressions.
  - Among these few studies, researchers have found 6-mo-olds attend more to eyes across expressions.<sup>6,7,8</sup>
- Additionally, very few researchers have used moving stimuli to study infants' emotional perception. Dynamic facial stimuli are more reflective of faces that infants see in everyday life and may yield more naturalistic scanning patterns.
  - Touchstone (2006, 2008) compared 6-mo-olds' categorization of static and dynamic expressions; emotion categorization was only found with static stimuli.<sup>9,10</sup>

| Prior Studies (6-mo)    | Categorize & Discriminate | Differences in eye gaze |
|-------------------------|---------------------------|-------------------------|
| Silent Static Emotions  | ✓ <sup>1,2,3,4,5</sup>    | ✓ <sup>6,7,8</sup>      |
| Silent Dynamic Emotions | ✗ <sup>9,10</sup>         | Few studies             |

## RESEARCH OBJECTIVES & HYPOTHESES

### OBJECTIVES

- To examine 6-mo-olds' scanning of emotional expressions
- To examine the effect of motion on infants' scanning of expressions

### HYPOTHESES

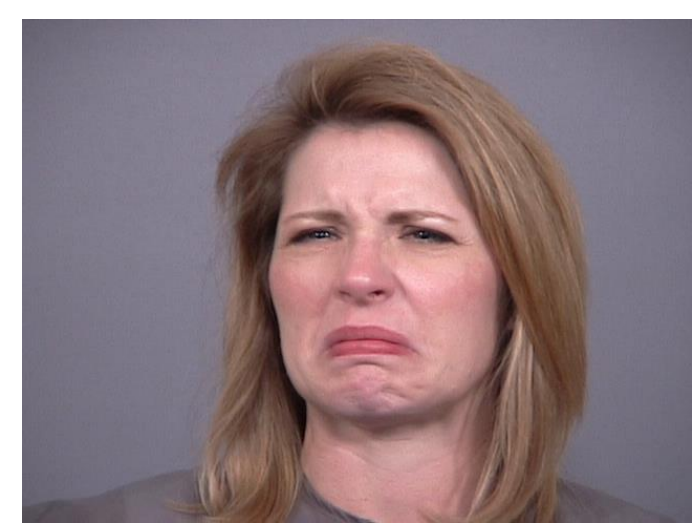
- Longer fixations to eyes of disgust faces than to happy eyes – based on findings showing infants' preference for negative valence eyes<sup>11,12</sup>
- More gaze shifts during dynamic stimuli – based on prior research on motion affecting infants' scanning<sup>13,14,15,16</sup>

## 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

- Static Happy
- Static Disgust
- Dynamic Happy
- Dynamic Disgust

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

**Participants:** 68 typically developing six-month-olds (41 males)  
(M age = 179 days, SD = 12 days)

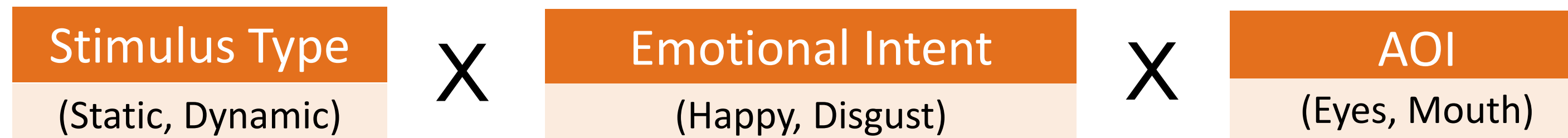
## ANALYSES

- Defined two Areas of Interest (AOIs): Eyes and Mouth



- Measured:
  - Total Fixation Duration:** proportion of total looking time to each AOI out of total looking to face (PTLT)
  - Visit Count:** the proportion of visits to an AOI out of total visits to face

- Two Mixed ANOVAs:**



## RESULTS

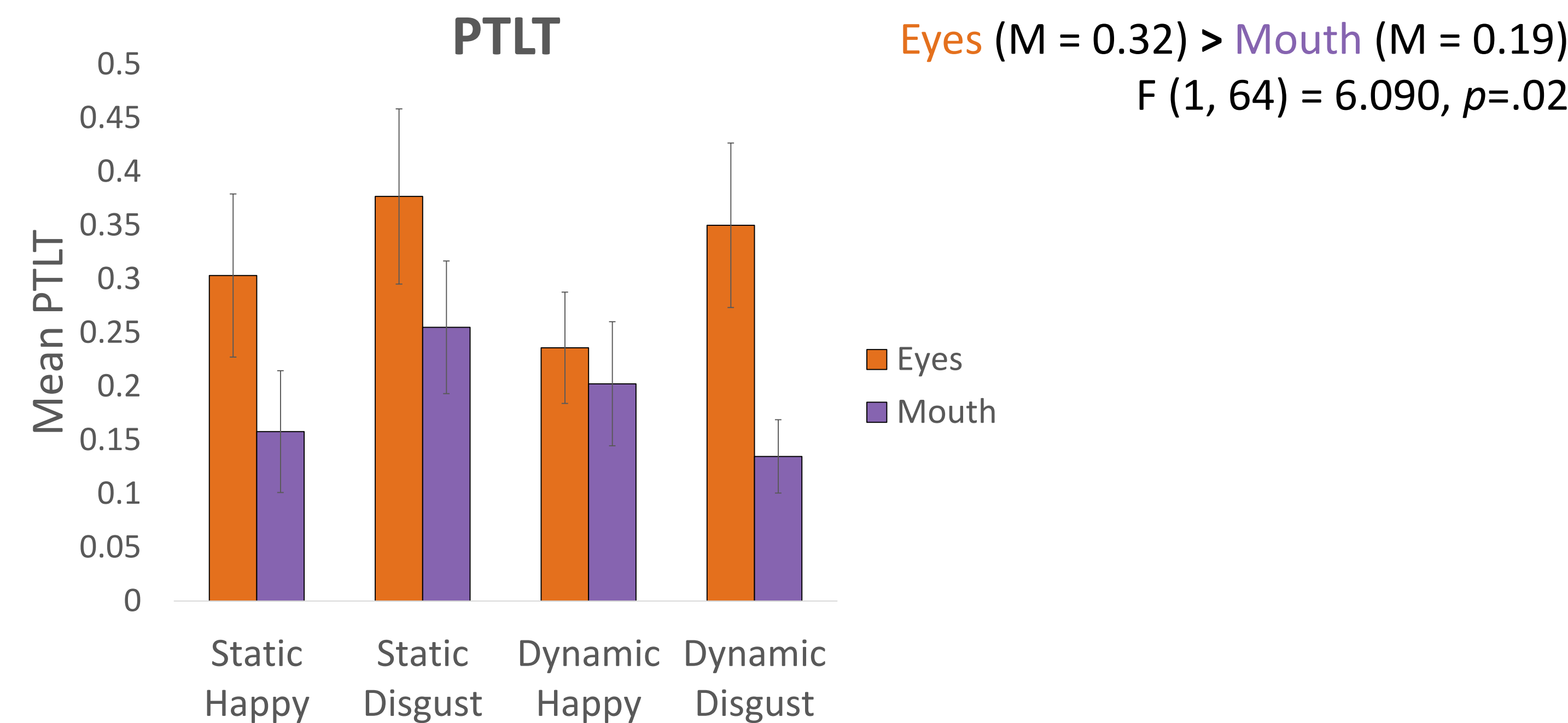
### Total Fixation Duration (PTLT)

Mixed ANOVA (Stimulus Type X Emotional Intent X AOI):

Main Effect of AOI:

Eyes (M = 0.32) > Mouth (M = 0.19)

F (1, 64) = 6.090, p = .02



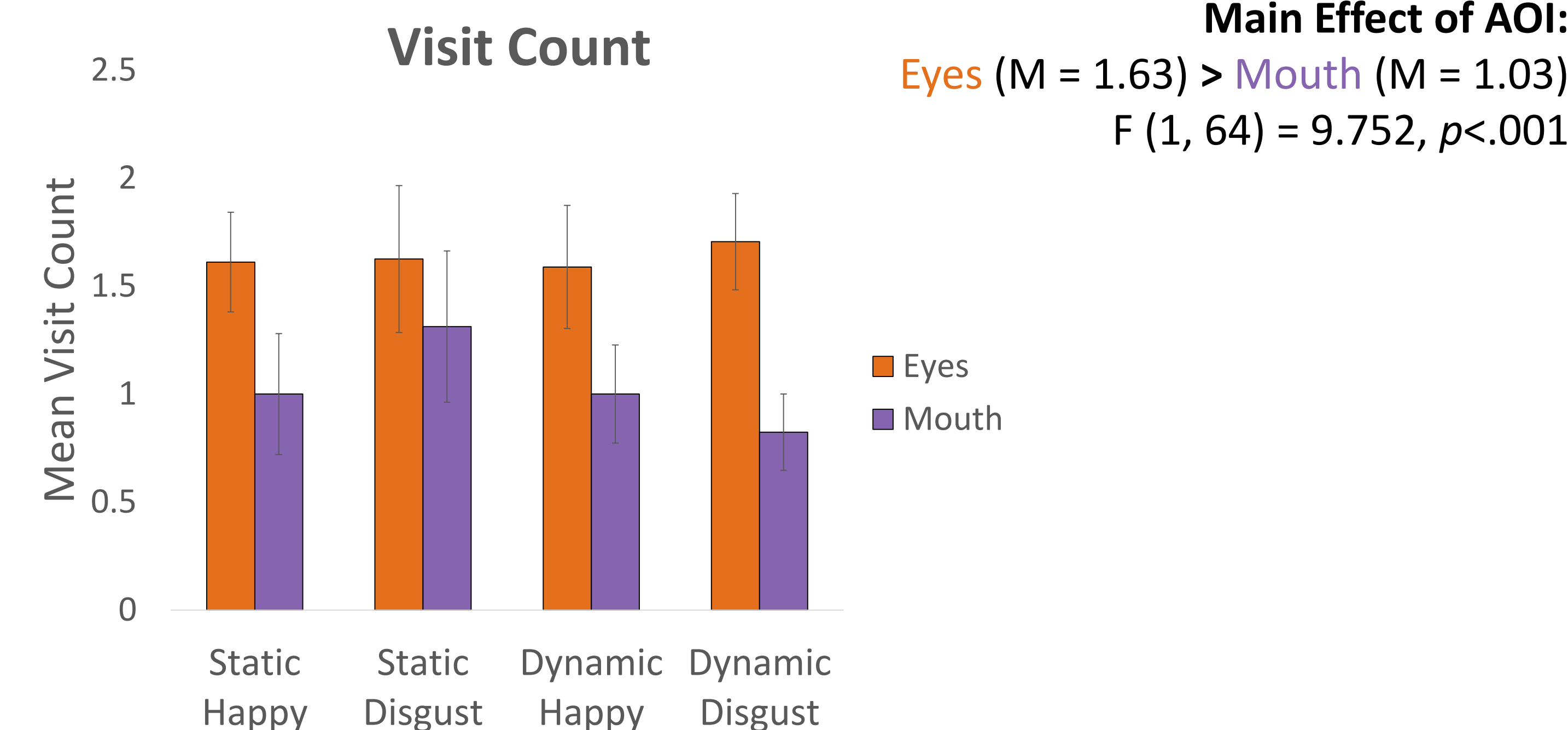
### Visit Count

Mixed ANOVA (Stimulus Type X Emotional Intent X AOI):

Main Effect of AOI:

Eyes (M = 1.63) > Mouth (M = 1.03)

F (1, 64) = 9.752, p < .001



## DISCUSSION

- No effects of motion or emotion on infants' scanning resulted. Infants fixated longer on and made more visits to **eyes** than mouth across all stimuli.

Trend across emotions: **Eyes > Mouth**

Figure 1. (right) shows one stimulus – Static Disgust – and infant fixations during presentation

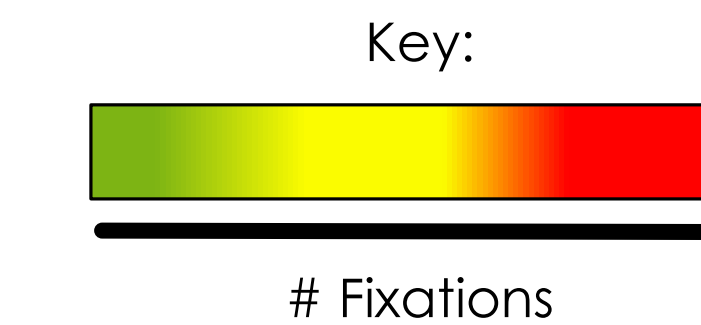


Figure 1: "Heatmap"

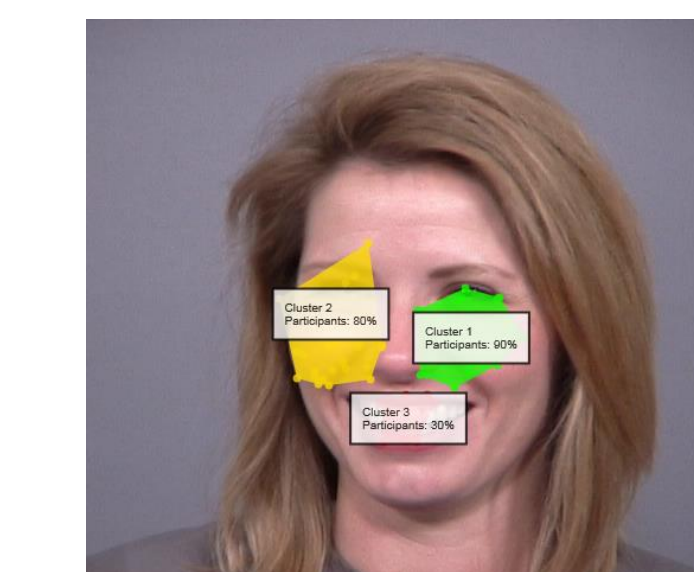


Figure 2: Cluster map

Figure 2. (left) shows one stimulus – Static Happy – and percentages of fixations during presentation

- Cluster A: (Viewer's Left Eye): 90%
- Cluster B: (Viewer's Right Eye): 80%
- Cluster C: (Mouth): 30%

### Differences across Emotions:

- 6-mo-olds' patterns of eye gaze while viewing facial expressions have not been studied extensively – results among these studies are mixed.
- However, studies using similar silent facial stimuli have found a pattern of looking to eyes at 6-months<sup>16</sup>

- Many studies using audiovisual stimuli have found more looking to mouths than eyes. In the absence of speech, infants may be looking for social information from eyes<sup>17</sup>

- Future studies should continue to investigate whether or not infants display greater attention to certain facial features for particular emotional expressions.

### Differences across Motion Types:

- Very few studies have used dynamic faces.
- Some researchers have suggested that trends in infants' scanning patterns for dynamic stimuli may emerge later in development than for the less complex, static stimuli.<sup>18,19</sup>
- Future work should consider infants' scanning of dynamic emotional faces at a later age to map infants' trajectory towards more adult-like scanning.

## References & Acknowledgments

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