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Parent Encouragement & Infant's Visual Attention

Jalena Slaton

University of Louisville

Nonah M. Olesen

University of Louisville

Cara W. Cashon

University of Louisville

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Jalena N. Slaton, Nonah M. Olesen, Cara H. Cashon
 Department of Psychological and Brain Sciences, University of Louisville

Introduction

Infant Attention to Objects

- Attention to objects appears to be linked to the development of early motor skills and experience with objects. Looking is an important aspect of object exploration, especially sustained looking to objects (Rochat, 1989).

Sticky Mittens Training

- Prior to 4 months of age, infants have not developed the motor skills necessary to reach and grasp objects yet.
- The Sticky Mittens (SM) task, in which mittens with Velcro are worn on the hands of the infant allowing the infant to pick up Velcro covered toys, provides pre-reaching infants with an opportunity to manually manipulate objects and learn from those experiences.
- Following active (vs. passive) SM training, young pre-reaching infants have shown increases in visual attention to objects, reaching, grasping and object exploration compared to control conditions (Needham et al., 2002; Sommerville, Woodward, & Needham, 2005; Libertus & Needham, 2010).

Current Study

- In a previous study in our lab, pre-reaching 4- to 5-month-old infants participated in a 10-minute in-lab SM training session followed by a causal perception test (Holt, 2016). Infants were assigned to the control group or one of four experimental conditions using a 2x2 design (parent encouragement vs. no encouragement; active vs. passive). Holt (2016) found that infants only exhibited causal perception in the active/no encouragement condition. Given past research showing the importance of active experience in SM training, it was surprising that infants did not exhibit causal perception in the active/encouragement condition.
- The difference in performance on the causal perception test between the two active conditions could be related to differences in infants' visual attention during the SM task. In the present study we conducted a secondary analysis of the active/encouragement and active/no encouragement conditions of Holt (2016) to test this hypothesis. After coding infants' looking behaviors during the SM session, two measures of visual attention (overall attention on task and sustained attention) were compared across the two conditions.

Methods

Participants

- N = 13 parent–infant dyads; 6 females and 7 males with a mean infant age of 4.39 months

Procedure

- Videos of SM training sessions for infants in the two active conditions (Encouragement and No Encouragement) from Holt (2016) were coded frame by frame using Datavyu (2014) coding software.

Methods (cont'd)

Coding

- Infants' on-task looks (i.e., infant looking at mittens and/or balls) (Figure 1a)
- Infants' off-task looks (i.e., infant looking at anything other than the mittens or balls) (Figure 1b)
- Ambiguous (i.e., it could not be determined whether the infant was on-task or off-task) (Figure 1c)

Note: Infant attention was not coded when mittens came off of the infants' hands, and coding resumed when the mittens were secured back on the infants' hands.

Calculations

Number of looks, total duration of looking, proportion of time on task and mean duration of looking time on task were calculated for each infant. Look durations under a second were not included.



Figure 1a: On-task: looking at the balls and/or the mittens



Figure 1b: Off-task: not looking at the balls or the mittens



Figure 1c: Ambiguous: coder can not determine where the infant is looking

Results

Table 1

Descriptive Statistics of Infant Visual Attention Variables (Median, IQR)

	Infant Visual Attention					
	On-Task		Off-Task		Ambiguous	
	Encouragement	No Encouragement	Encouragement	No Encouragement	Encouragement	No Encouragement
Count	37.5	42.0	32.0	35.0	7.5	2.0
Mdn	34.5	36.0	24.3	35.0	3.5	1.0
IQR	34.5 – 46.5	36.0 – 52.0	24.3 – 48.8	35.0 – 42.0	3.5 – 14.5	1.0 – 5.0
Total Duration	257.2	289.0	186.9	211.3	17.7	5.5
Mdn	232.3	201.6	126.7	137.8	9.7	1.9
IQR	232.3 – 277.0	201.6 – 327.4	126.7 – 276.9	137.8 – 250.3	9.7 – 59.0	1.9 – 10.9

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Results (cont'd)

Analysis

- Due to small sample sizes, Mann-Whitney U tests were used to compare Proportion of Attention On Task and Mean Look Duration between conditions.

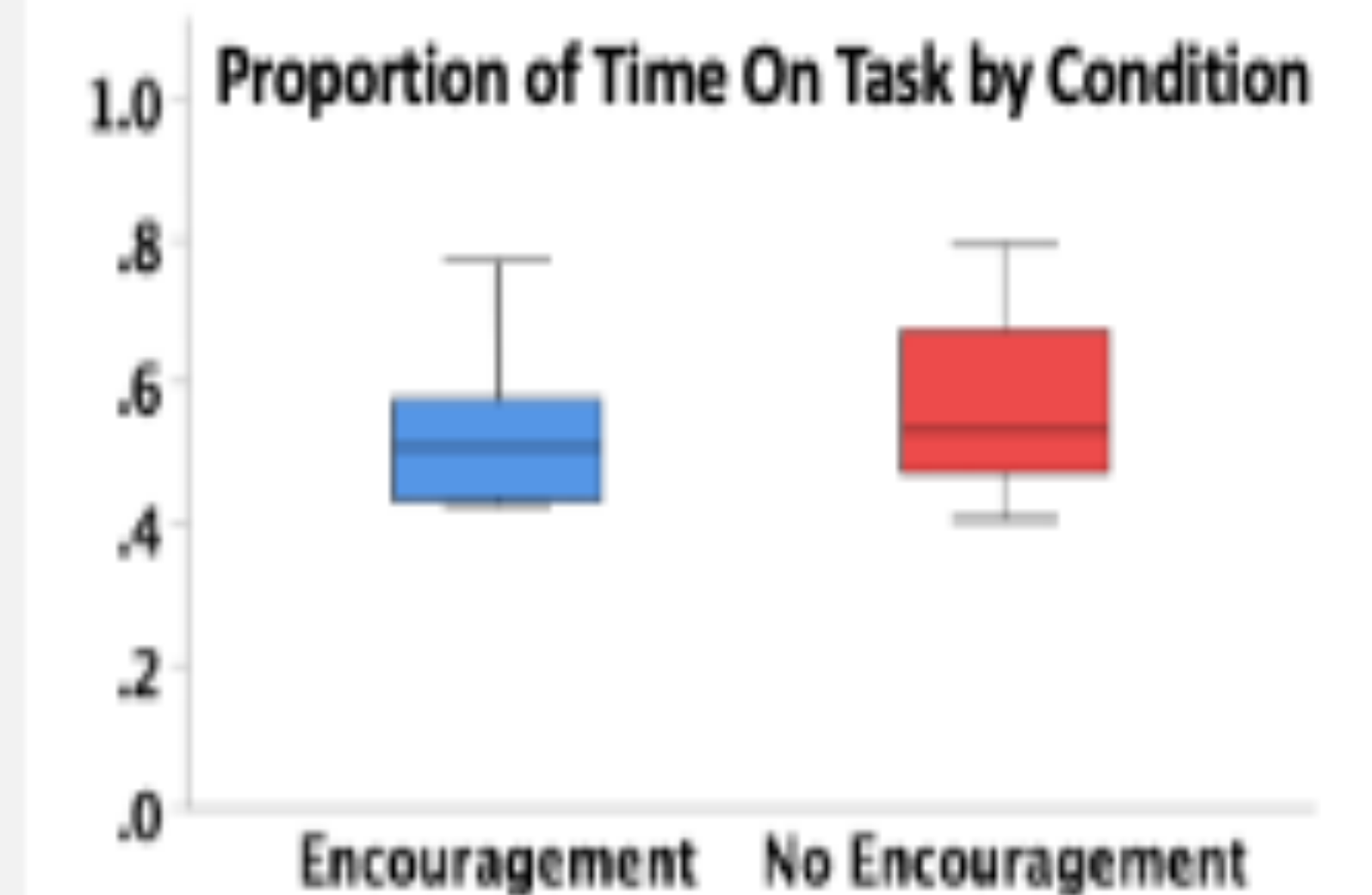


Figure 2a: A box plot of the proportion of time that was spent on task in the encouragement and no encouragement condition

- No significant difference in Proportion of Attention On Task between the two groups was found, $U = 18, p = .731$. (Figure 2a)

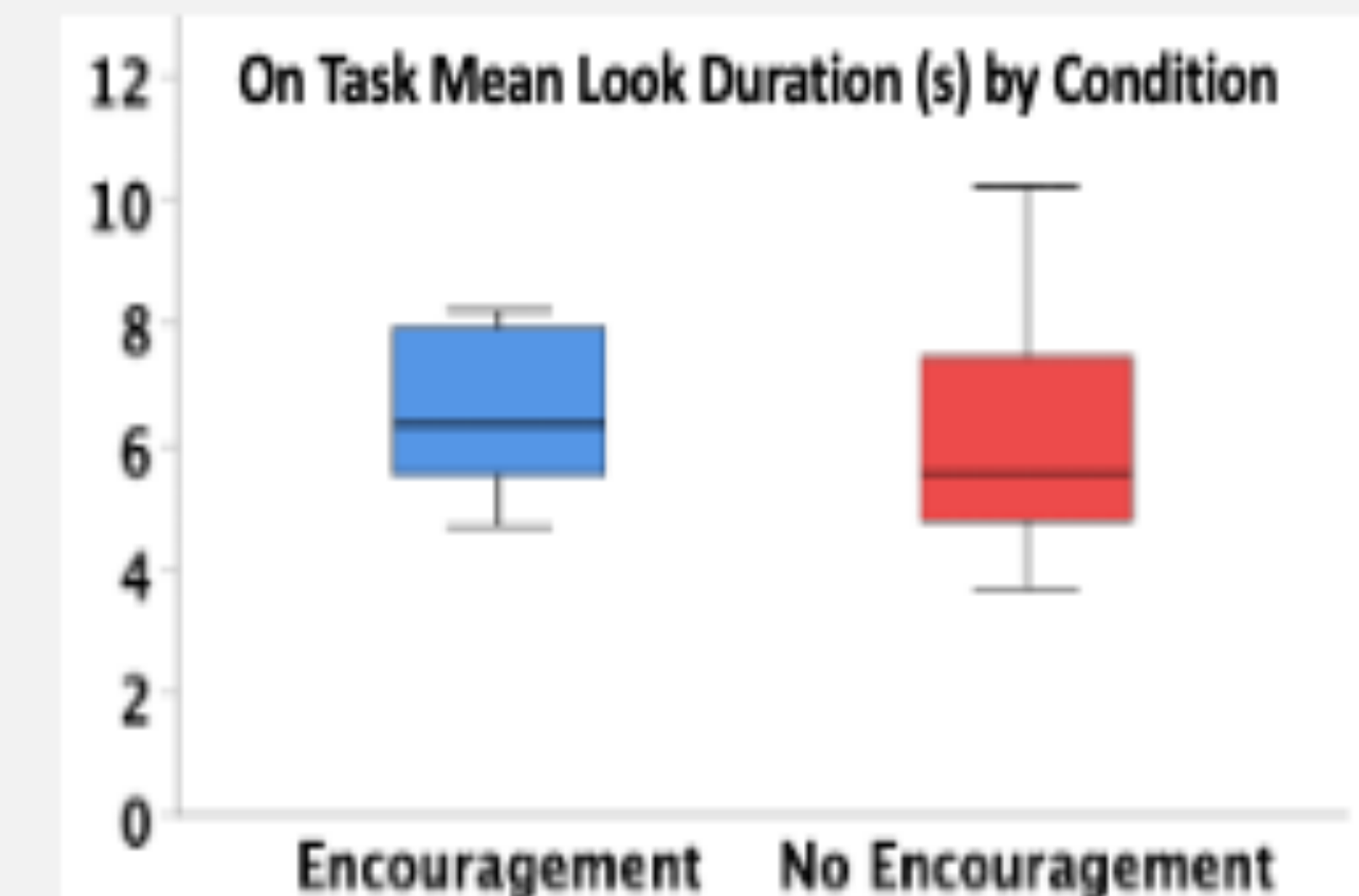


Figure 2b: A box plot of the mean look duration in seconds on task in the encouragement and no encouragement condition

- Similarly, no significant difference was found for Mean Look Duration, $U = 18, p = .731$ (Figure 2b).

Discussion

- In the present study, we hypothesized that differences in infants' attention would account for the difference in learning outcomes found in Holt (2016).
- However, no statistically significant differences were found for either proportion of time on task or mean look duration between the encouragement and no encouragement conditions suggesting that infants' attention to objects may not account for the differential performance on the causal perception task.
- A limitation of the current study, which may have contributed to the null findings, is the small sample size. This secondary analysis of the videos is on-going, so these findings should be considered preliminary.
- In the present study, parents' behaviors (such as moving into infants' view) were not coded. Future analyses will explore the role that parents play in their infants' visual attention to objects during the SM session.