

Mutual Exclusivity in Young Children with ASD: An Eye-Gaze Study

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INTRODUCTION

- Typically developing children assume that a novel label describes an unfamiliar object, as opposed to a familiar object with a known name—a phenomenon called *mutual exclusivity*¹.
- Mapping novel words to novel objects may help children learn words. Deficits in mutual exclusivity could be related to the early vocabulary delays experienced by many children with ASD.

Older children with ASD show mutual exclusivity,^{2,3} but this issue has not been investigated in young children with ASD.

The objectives of this study were:

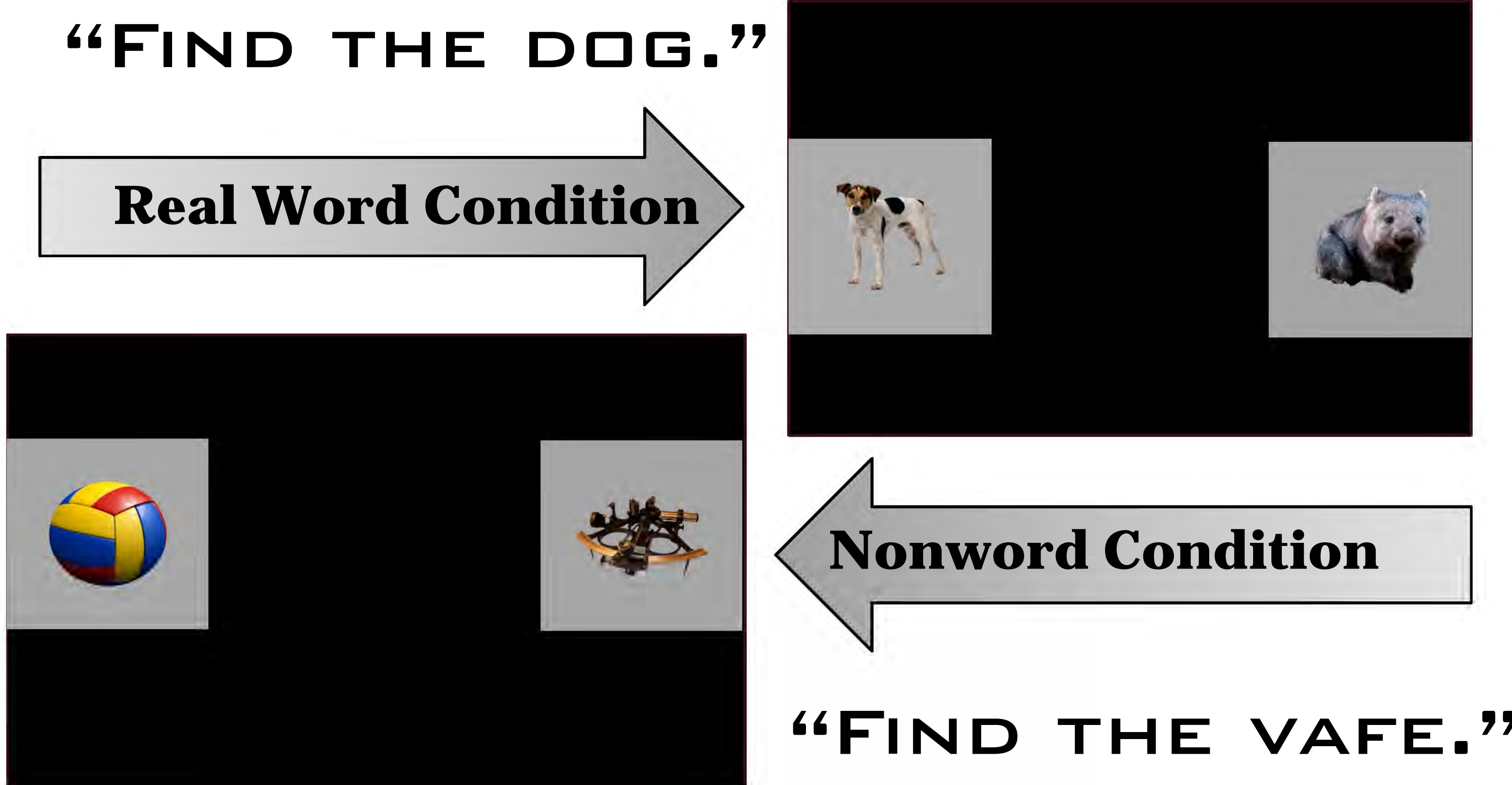
- To determine whether young children with ASD demonstrate mutual exclusivity by attending to an unfamiliar image when they hear a nonword.
- To compare how quickly and accurately these children process familiar words versus nonwords.

PARTICIPANTS

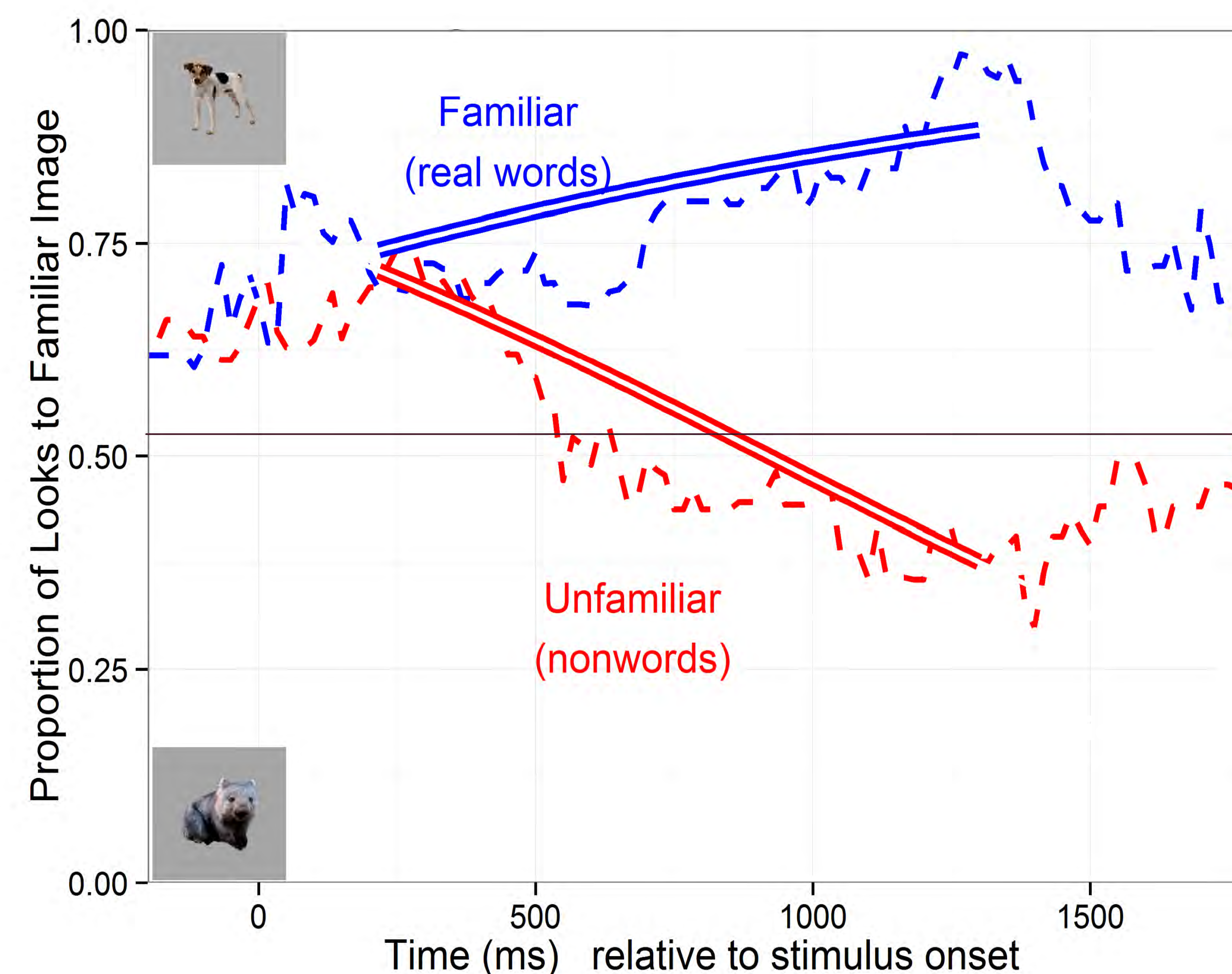
	ASD Group (n = 18)	
	Mean (SD)	Range
Chronological age in months	31 (3)	26 – 36
Bayley-III Composite Scores	86 (13)	55 – 105
Parent-reported receptive vocabulary in words	165 (87)	20 – 316

Note. An additional 10 children were excluded due to excessive missing data. Bayley-III Composite scores have a mean of 100 and a SD of 15. Vocabulary was measured using the Communicative Development Inventory, Words and Sentences (maximum number of words = 396).

MUTUAL EXCLUSIVITY TASK



- Children completed the mutual exclusivity task while their eye movements were tracked with a Tobii T60-XL. Looks from 200 – 1300 ms after noun onset were coded as looks to target or distracter. Trials were eliminated if children were not reported by their parent to understand the familiar word or looked away from the screen over 60% of the time.
- A binomial logistic mixed-effects model was constructed with time and condition (Real Word vs. Nonword) as predictors and looks (target vs. distracter) as the dependent variable. The model included participant*condition random effects for intercept and slope.



Dashed lines represent raw data from -200 ms to +1800 ms after noun onset. Double solid lines represent logistic model fit within the window spanning +200 ms to +1300 ms following target word onset. The solid black line represents equal looking to both images (i.e., chance performance).

RESULTS

- Children increased their looks to unfamiliar images after hearing nonwords, despite an initial preference for the familiar images (significant non-zero slope toward unfamiliar image).
- In the Nonword condition, the proportion of target looks stabilized around 0.50.
- Children looked significantly more to the target in the Real Word than the Nonword condition. There was a significant time*condition interaction showing a steeper slope in the Nonword than the Real Word condition.

CONCLUSIONS

Young children with ASD demonstrated mutual exclusivity by increasing looks to unfamiliar images after hearing nonwords. This strategy might help them determine the referents of new words.

Nevertheless, they continued to look at the familiar object about half of the time, possibly demonstrating the impact of baseline visual preferences on attention allocation in a language-based task.

Additional research is needed to investigate the relationships among visual attention, language processing, and language learning in children with ASD.

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