

# Spoken Word Recognition is Negatively Associated with Autism Severity in Young Children with Autism Spectrum Disorder



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## INTRODUCTION

- There is growing interest in how autism severity relates to language development in children with autism spectrum disorder (ASD).
- Bavin et al. (2014, *Autism Research*) found that 6-year-old children with more severe autism symptoms showed poorer spoken word recognition than children with moderate symptoms.
- **However, we do not know whether associations between autism severity and word recognition hold over time or in younger children with ASD.**

**Research Question: Does spoken word recognition accuracy in toddlers with ASD predict their autism severity concurrently or 2 years later?**

- Children participated in a spoken word recognition task that presented two images on a screen and named one of them. Eye movements were video recorded and coded offline.
- The task included Competing and Neutral trials.



← Neutral  
Unrelated Images



← Competing  
Perceptually Similar Images

**Predictions:** Word recognition accuracy will be negatively associated with autism severity. This relationship will be stronger for word recognition in the presence of a perceptually similar distracter.

## PARTICIPANTS

- Participants were 20 children with ASD seen at age 31 months (Time 1) and age 56 months (Time 2).

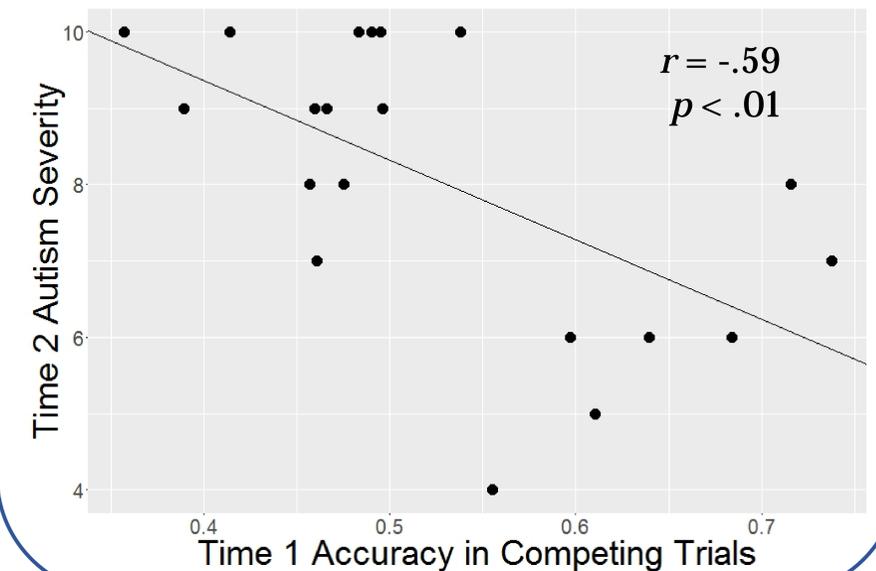
	Time 1		Time 2	
	Mean (SD)	Range	Mean (SD)	Range
Age (months)	31 (4)	24 – 36	56 (4)	49 – 62
Autism Severity	8 (2)	4 – 10	8 (2)	4 – 10
Cognitive Level	81 (12)	60 – 100	77 (27)	38 – 108
Receptive Lang	148 (119)	0 – 395	77 (24)	50 – 118
Expressive Lang	47 (77)	0 – 256	68 (16)	50 – 95

**Note.** Autism Severity = Autism Diagnostic Observation Schedule, 2<sup>nd</sup> Edition comparison scores. Cognitive Level = Bayley Composite (Time 1) and Mullen Ratio IQ (Time 2). Receptive Lang = CDI Words Understood (Time 1) and PLS-4 Auditory Comprehension Standard Score (Time 2). Expressive Lang = CDI Words Produced (Time 1) and PLS-4 Expressive Communication Standard Score (Time 2).

## RESULTS

- Word recognition accuracy was the proportion of looks to the named image from 200-1800ms after noun onset.
- Mean accuracy in Neutral trials was .54 ( $SD = .09$ , range = .31 – .71). Mean accuracy in Competing trials was .53 ( $SD = .11$ , range = .36 – .74).
- We used one-tailed  $p$  values based on our predictions.
- Accuracy in Neutral trials at Time 1 was not associated with autism severity at either time point ( $ps > .42$ ).
- Accuracy in Competing trials at Time 1 was not significantly correlated with autism severity at Time 1 ( $p = .24$ ).
- Accuracy in Competing trials at Time 1 was significantly correlated with autism severity at Time 2 ( $r = -.59$ ,  $p < .01$ ).
- This correlation remained significant after controlling for Time 1 language (CDIWG-WP;  $r_{partial} = -.40$ ,  $p = .044$ ) and Time 1 autism severity ( $r_{partial} = -.42$ ,  $p = .004$ ).

## EARLY SPOKEN WORD RECOGNITION AND LATER AUTISM SEVERITY



## CONCLUSIONS

Spoken word recognition accuracy in the presence of perceptually similar distracter images was negatively associated with autism severity two years later—even after controlling for early autism severity and language skills.

This finding suggests that the extent to which word recognition is disrupted by perceptually similar distracter images is predictive of later autism symptoms.

More work is needed to examine the interplay among visual attention, word recognition, and language development in children with ASD.

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