

USE OF MUTUAL EXCLUSIVITY IN TODDLERS WITH AUTISM SPECTRUM DISORDER

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BACKGROUND

- Early language learning mechanism: Mutual Exclusivity (ME)
 - Tendency to map a novel label to an unfamiliar object (Markman & Wachtel, 1988)
- TD children reliable by 24 months, increasing robustness until 48 months (Lewis et al. 2019)

BACKGROUND

- **Variable language ability across autism spectrum**
(Anderson et al., 2007)
 - **Early language mechanisms, such as ME, may play an important role**
- **Mixed evidence in school-age children with ASD**
(Hartley, 2019; deMarchena et al., 2011).

WHAT ABOUT TODDLERS?

- ME is demonstrated in TD toddlers within the second year of life (Lewis et al., 2019)
- Are toddlers with ASD following a similar trajectory?
 - ME has been studied in “high risk for ASD” toddlers (Bedford et al., 2013)
 - More information needed in toddlers with ASD diagnoses



Vast spectrum of language abilities in ASD



What early mechanisms could drive these differences?



Mutual exclusivity (ME)



No evidence to date in toddlers with confirmed ASD

Research question

Do toddlers with ASD differ from typically developing children, matched on non-verbal cognition, in their use of ME during referent selection?

Hypothesis

We predicted that toddlers with ASD would show intact ME ability as has been shown in older autistic children.

METHODS

- Eye-tracking paradigm - Looking While Listening (LWL) (Fernald, 2008)
- Referent selection: tendency to look to a named object
- Data coded offline in addition to automatic eye-tracking
 - Hand coding has been shown to decrease data loss in this population (Venker et al., 2019)

PARTICIPANT CHARACTERISTICS

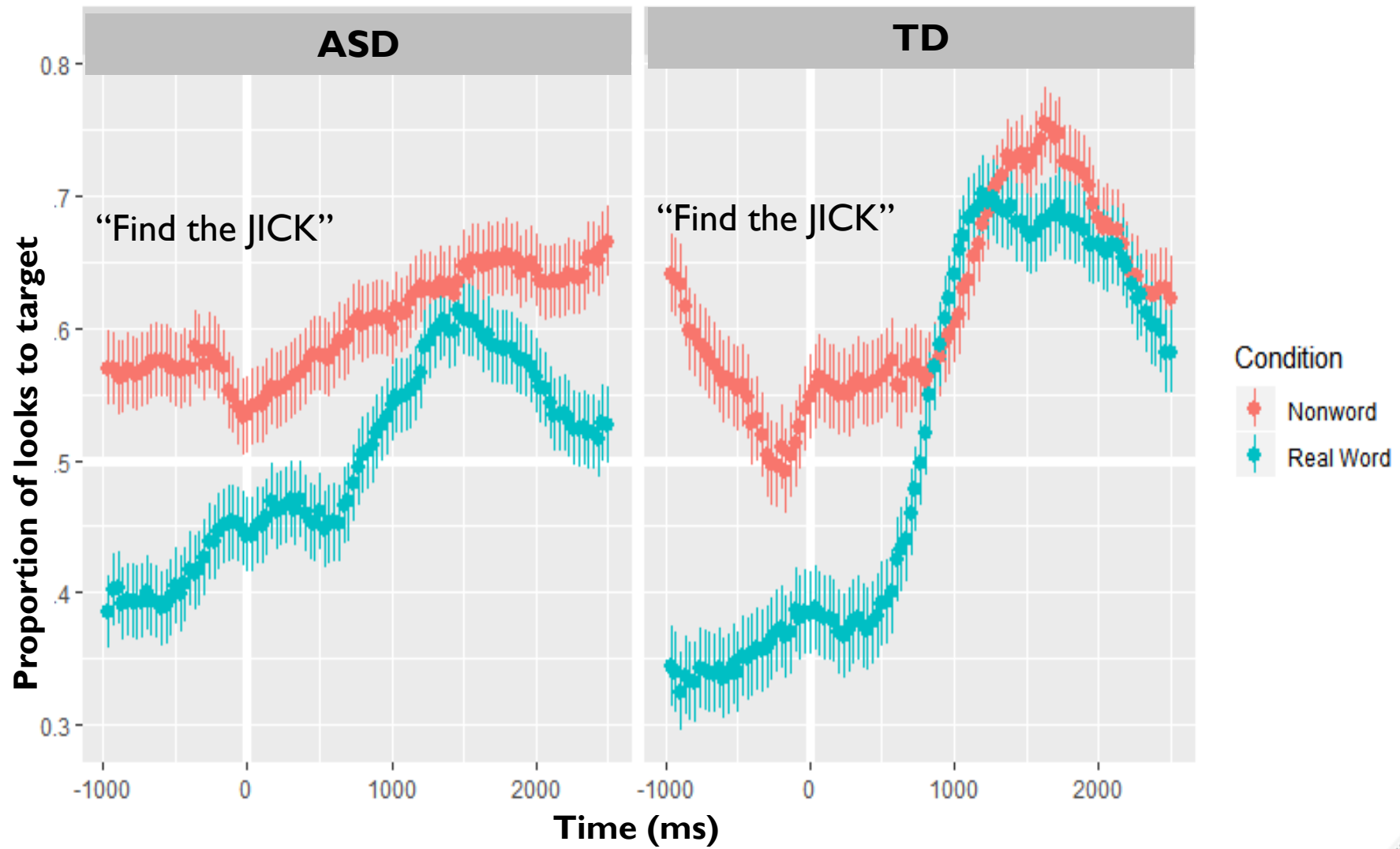
	n = 26 TD	n = 32 ASD	
Age in months	20.38 (1.6)	30.69 3.54	$p < .05$
Mullen VR Raw (<i>matching variable</i>)	25.96 (3.6)	25.34 (3.4)	p = .505
Mullen VR t-score	56.73 (9.3)	33.12 (10.9)	$p < .05$
PLS Aud Comp SS	103 (14)	64.03 (13)	$p < .05$
PLS Aud Comp Raw	25.27 (4.2)	20.16 (5.1)	$p < .05$
Sex	10 F 16 M	10 F 22 M	$p < .05$
ADOS severity score	n/a	8.28 (1.7)	

Research question:

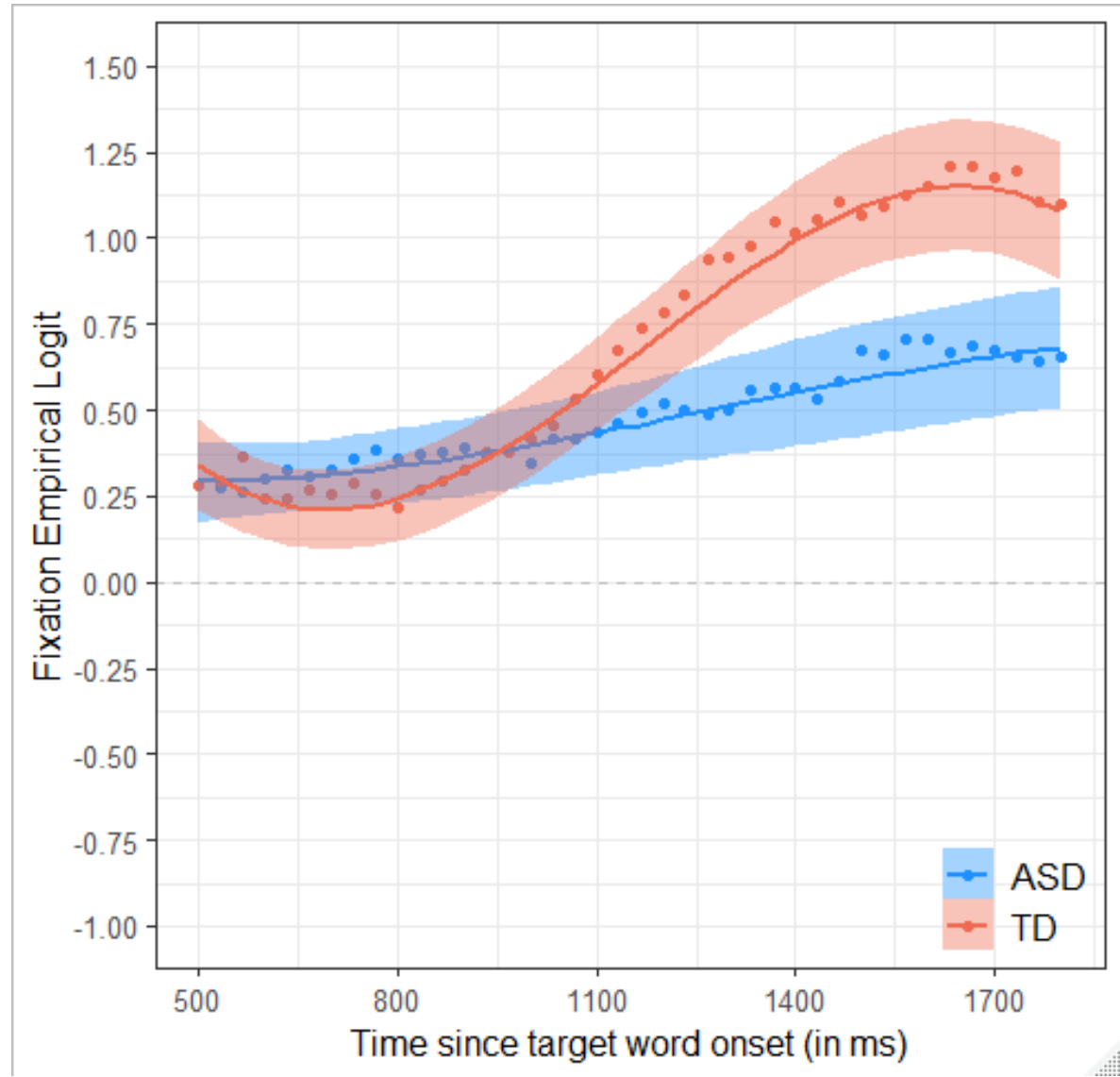
Do toddlers with ASD differ from typically developing children, matched on nonverbal cognition, in their use of ME during referent selection?

ANALYSES & RESULTS

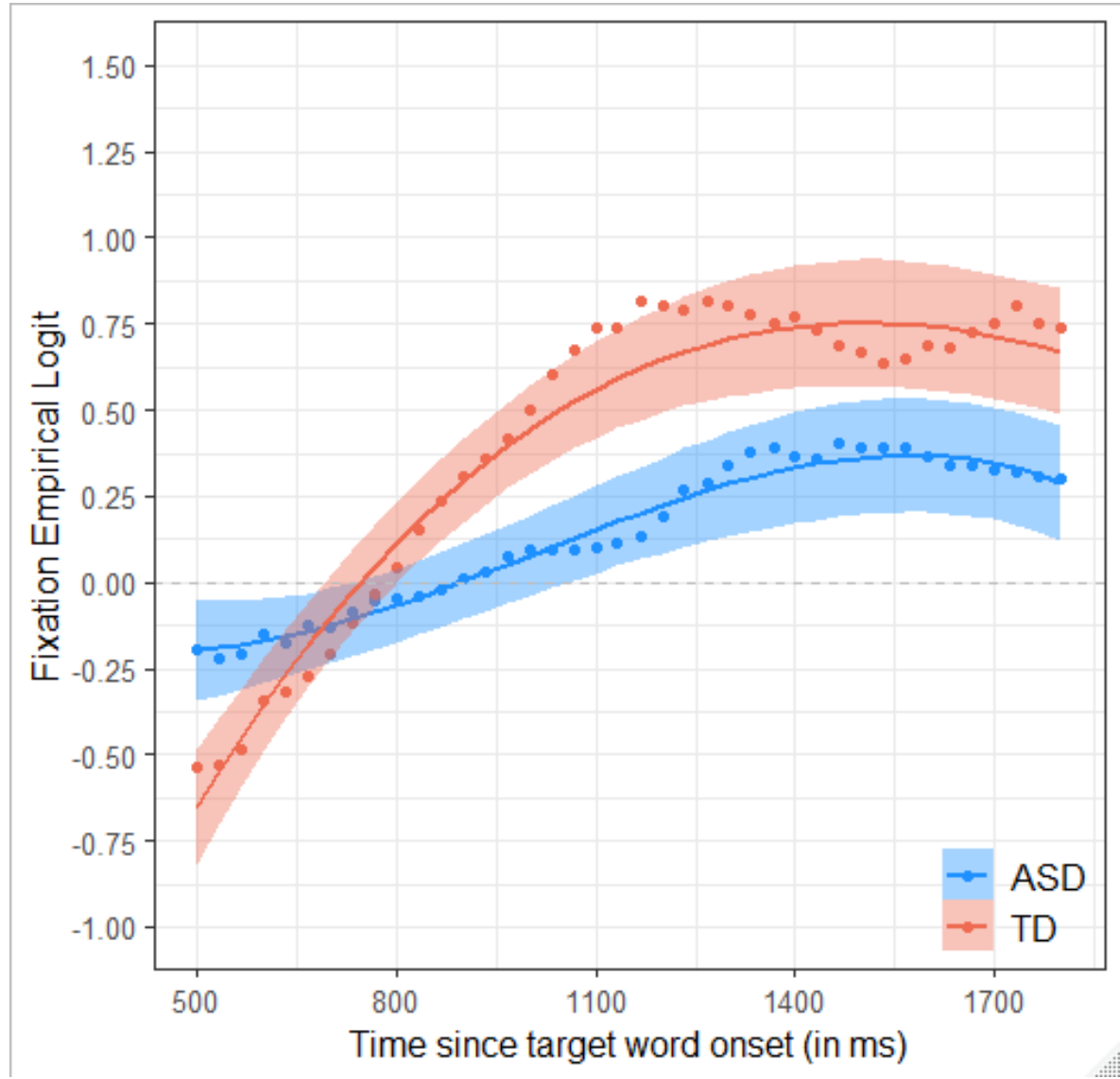
Looking Behavior Across Trial Window (-1000 – 2500ms)



RESULTS: NONWORD CONDITION

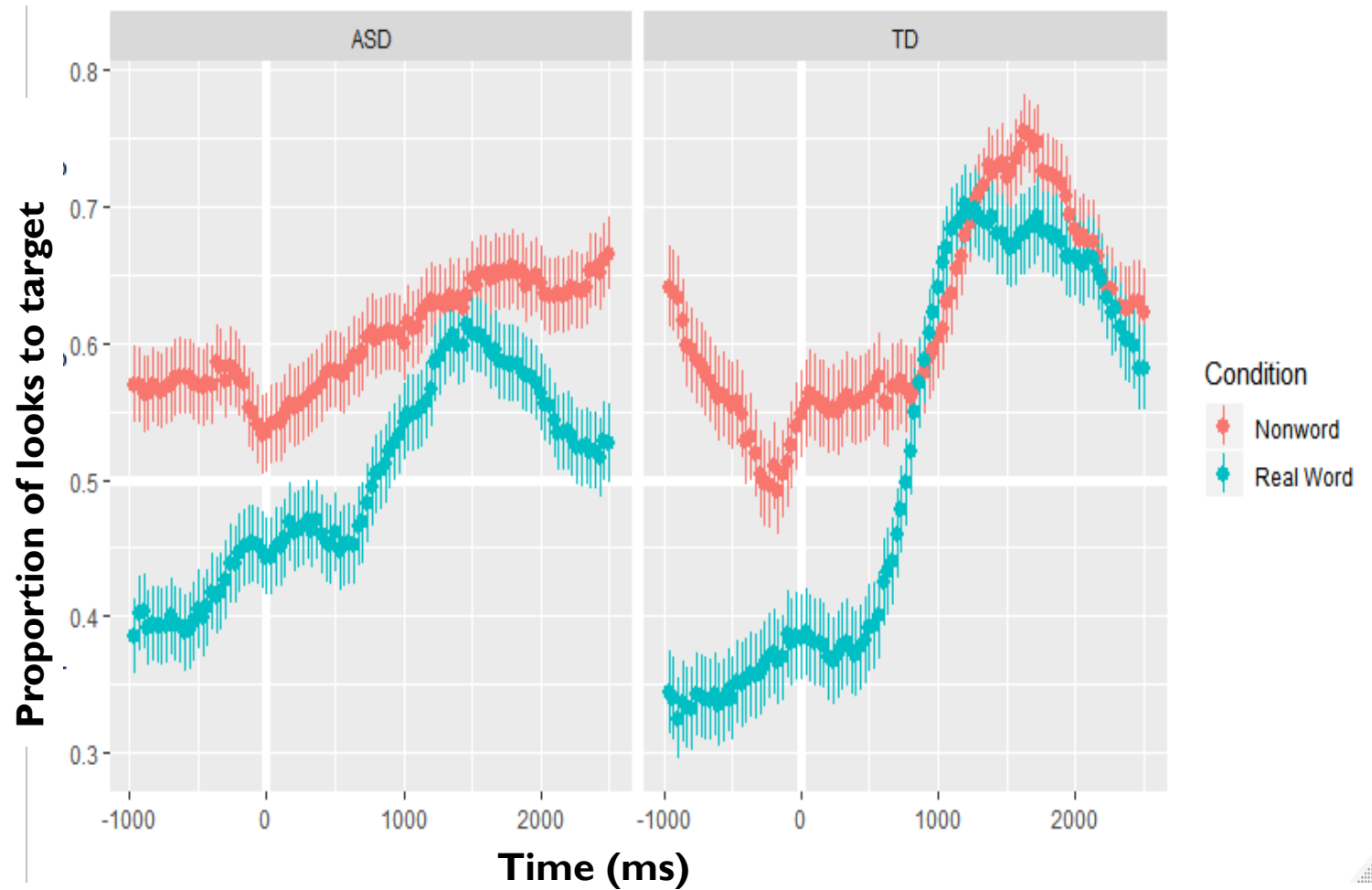


RESULTS: REAL WORD CONDITION



**RESULTS:
NONWORD
CONDITION,
ACCOUNTING
FOR REAL
WORD
PERFORMANCE**

Looking Behavior Across Trial Window (-1000 – 2500ms)



Research question

Do toddlers with ASD differ from typically developing children, matched on non-verbal cognition, in their use of ME during referent selection?

Results

Yes, children with ASD performed significantly differently than TD group in non-word condition

DISCUSSION

- ASD group performing significantly differently on this task than TD toddlers matched on nonverbal cognition, such that ASD group not demonstrating robust use of ME
- Difference remains significant when accounting for real word processing performance

DISCUSSION

- Novelty bias:
 - Toddlers prefer novelty during referent selection (Horst et al., 2011)
 - Children with ASD in our sample appeared to be more affected than TD children
 - Hyper-focus on novel object may prevent children from being able to use information about the familiar object in order to disambiguate

DISCUSSION

- Factors to consider
 - Retention
 - Generalization
 - Directionality
- Future directions
 - Relationships between performance on this task and language ability

THANK YOU

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 - Lab clinicians Heidi Sindberg, MS, CCC-SLP and Jessica Umhoefer, PsyD
 - Undergraduate Coders

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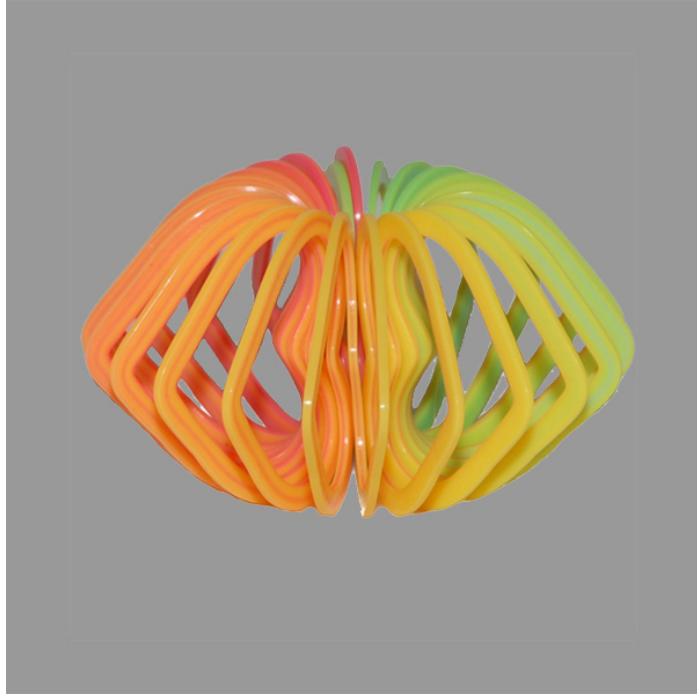
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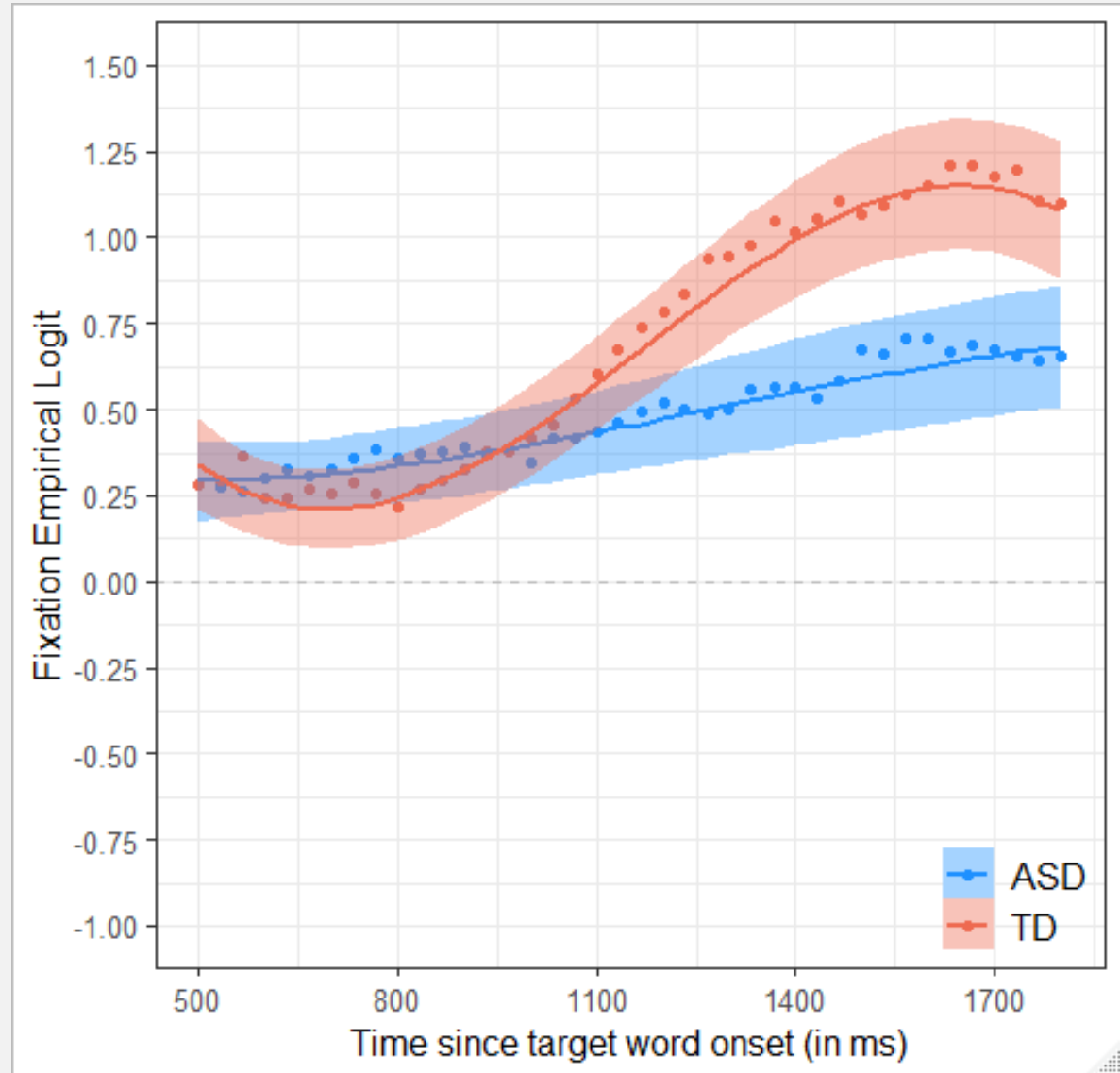
**SAMPLE REAL WORD TRIAL:
“FIND THE SHOE!”**



**SAMPLE NONWORD TRIAL:
“FIND THE JICK!”**

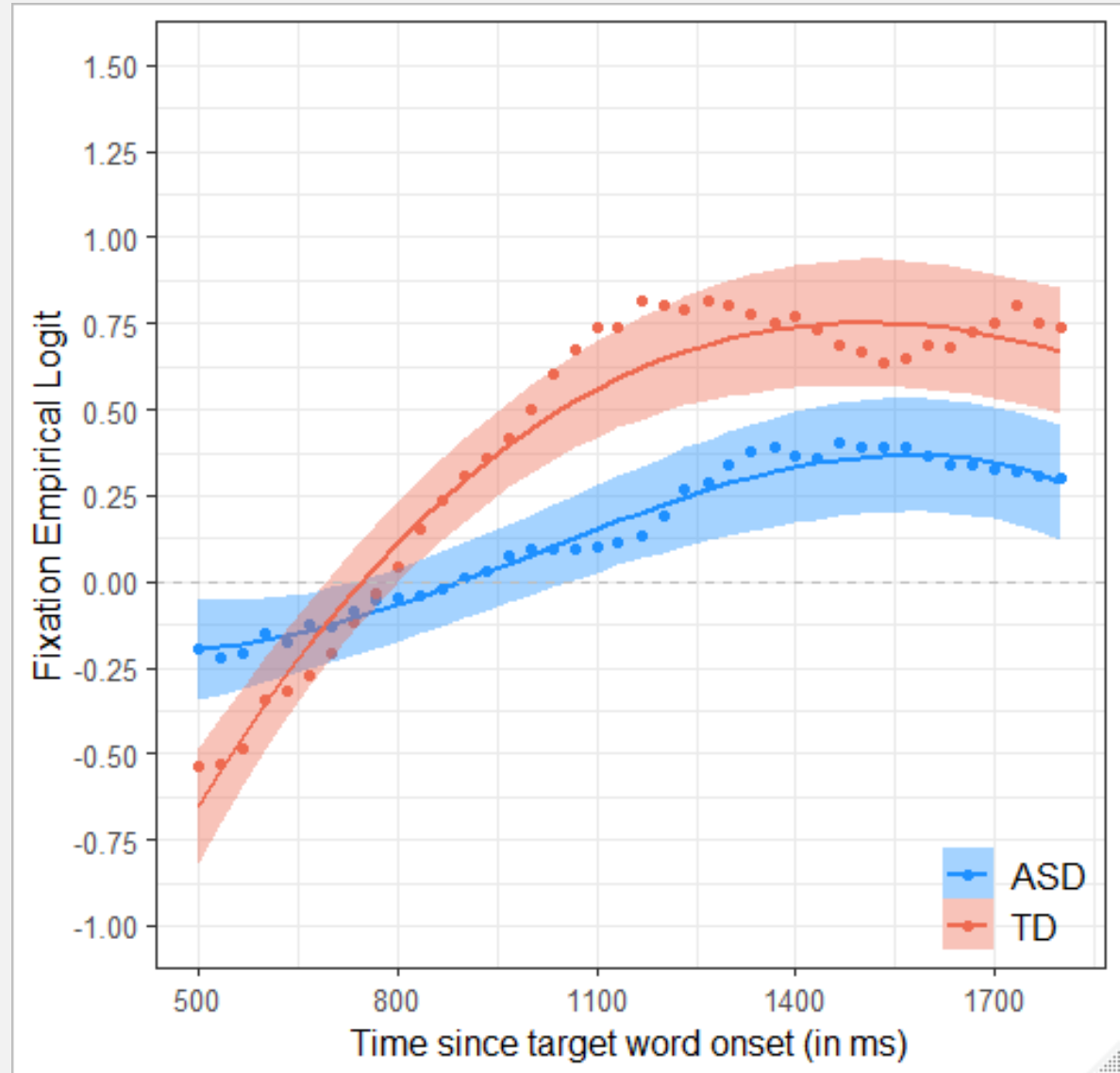
RESULTS: NONWORD CONDITION

- Intercept $p = 0.001^{**}$
- Group x Linear Time $p = 0.03^*$
- Group x Quad Time $p = 0.89$
- Group x Cubic Time $p = 0.03^*$



RESULTS: REAL WORD

- Intercept $p = .001^{**}$
- Group x Linear Time $p = 0.08$
- Group x Quad Time $p = 0.02^{*}$
- Group x Cubic Time $p = 0.16$



RESULTS: NONWORD CONDITION, ACCOUNTING FOR REAL WORD

- Intercept $p < .001$ ***
- Group x Linear Time $p = 0.035$ *
- Group x Quad Time $p = 0.909$
- Group x Cubic Time $p = 0.055$

