

# Naturalistic Joint Attention and Theory of Mind in Children with ASD and TD



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## INTRODUCTION

• **Theory of Mind (ToM)** → the ability to take the perspective of another person

• **Joint Attention (JA)** → the ability to coordinate with a person during communication

• Language and JA → precursors to ToM in both children with ASD<sup>1</sup> and TD peers.<sup>2,3</sup>

• Previous research on JA: (a) involved constrained situations (b) no independent investigation of language (c) did not distinguish responder from initiator of JA

• **Here we examine how parent-toddler engagement in JA during free-play and early language relate to ToM performance 3 years later**

## METHODS

	n	Age V1 Months	MSEL VR Raw Scores	MSEL RL Raw Scores	Age V7 Years
TD	22	20.29(5.5)	26.41(3.4)	24.8(3.1)	5.52(.3)
ASD	20	32.88(1.7)	28(3.7)	24.8(8)	6.45(.5)

• Parent-toddler dyads → engaged in 3, 30-minute, semi-structured play sessions separated by 4 months as part of a longitudinal study<sup>5</sup>

• Groups matched on receptive language at Visit 1<sup>6</sup>

• Sessions were recorded and coded for JA type

• **IJA** → child initiates, parent responds

• **RJA** → parent initiates, child responds

• **PA** → dyads focused on the same object, but no referential looks between parent and child

• **ToM** was assessed approximately 3 years later

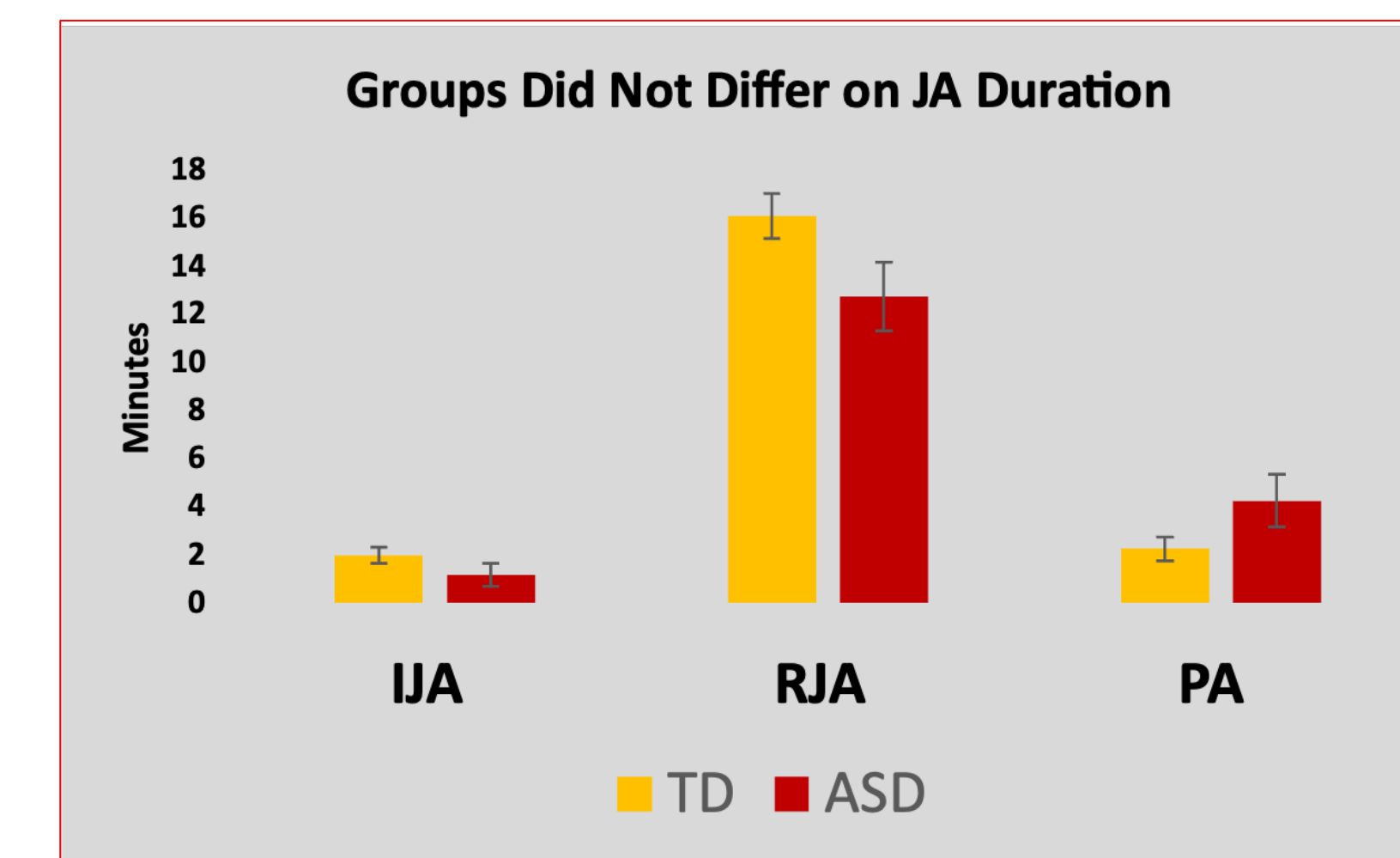
- Unexpected change of contents task
- Unexpected change of location task
- Summed for one composite score

## RESULTS

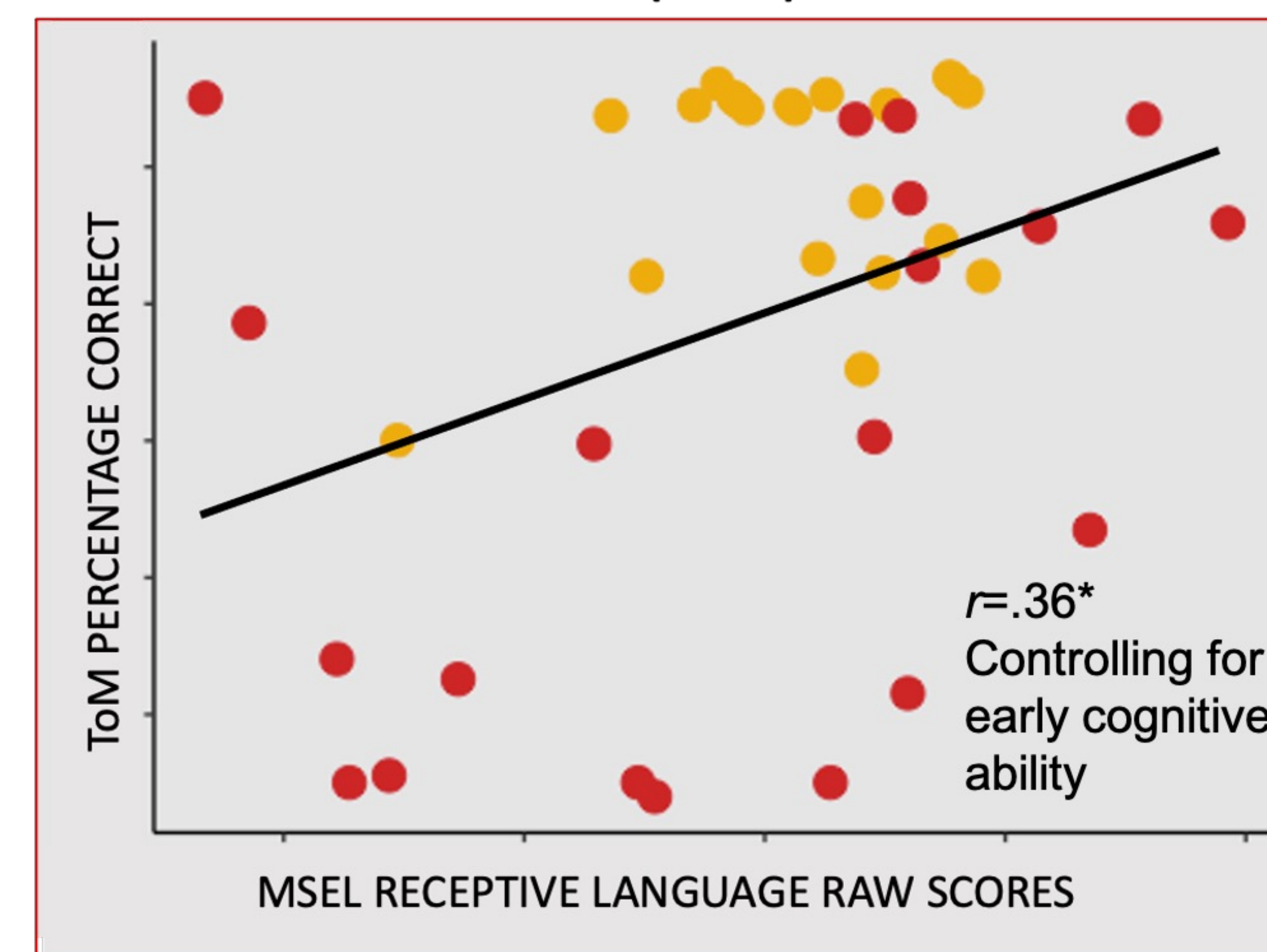
TD → significantly higher TACL scores and ToM performance than ASD group

	TD	ASD
TACL Vocabulary Raw Scores <sup>7</sup>	36.55 (4.9)	29.3 (8.9)**
TACL Quotient	120.7 (11.4)	78.5 (22.1)***
ToM Percent Correct	89.39 (15.7)	48.73 (39.9)***

No group differences in JA types averaged across all 3 visits



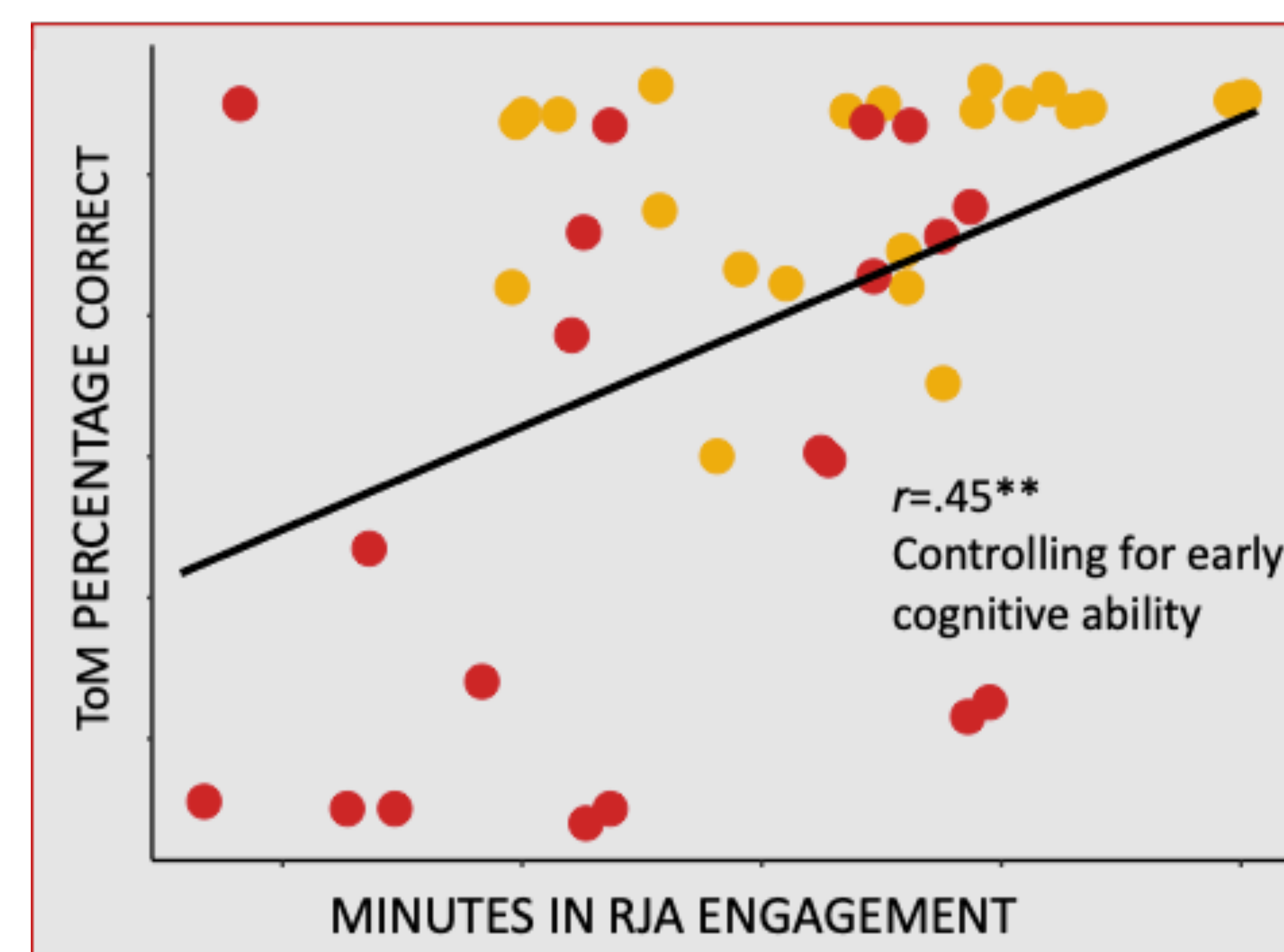
### BETTER RECEPTIVE LANGUAGE (Visit 1) RELATES TO BETTER ToM



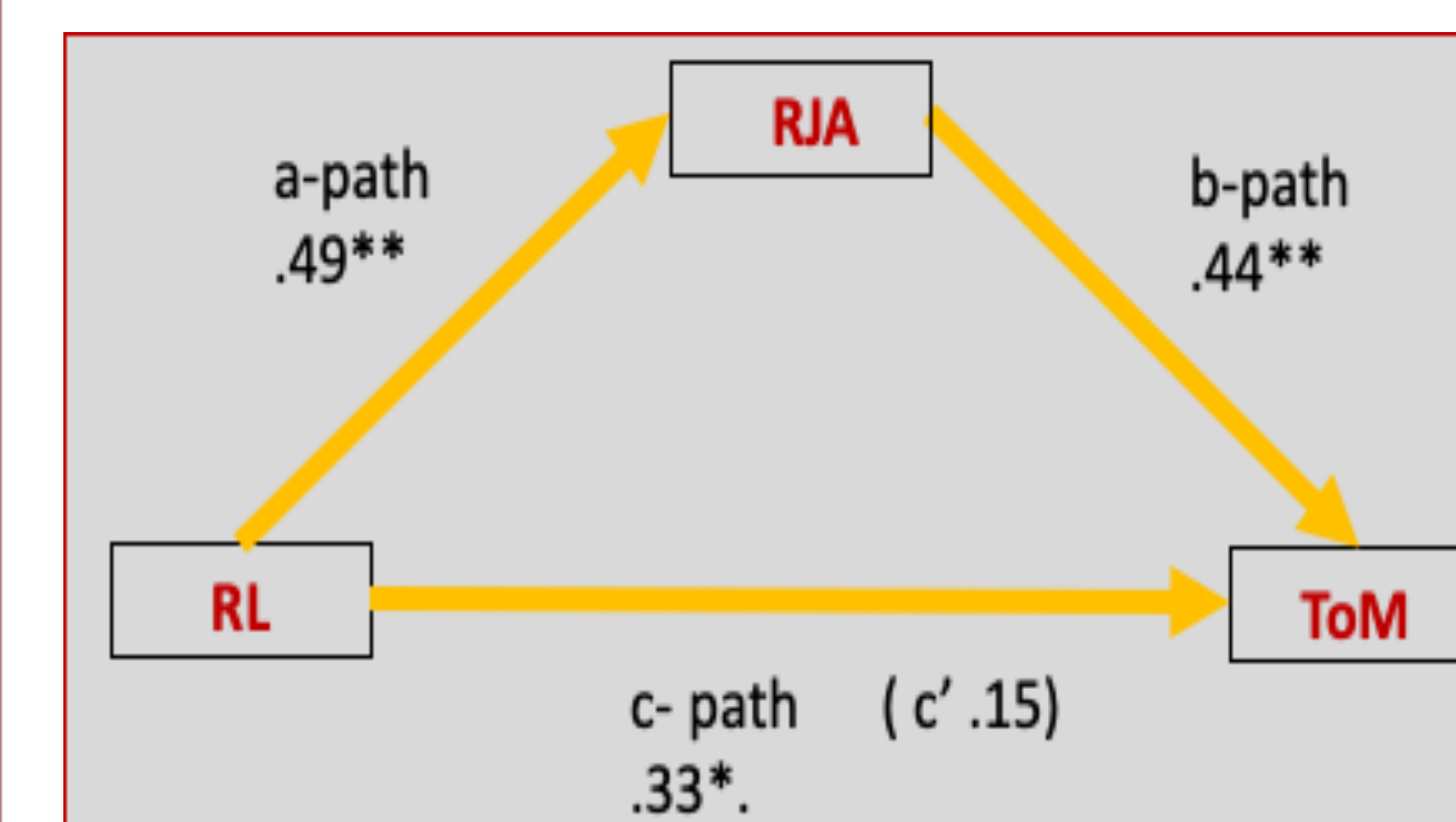
Early receptive language (Visit 1) and RJA were positively related to better ToM performance in the entire sample controlling for early cognitive ability (Visit 1)



### MORE TIME IN RJA RELATES TO BETTER ToM



RJA → mediated the relationship between early receptive language ability and ToM



## DISCUSSION

• Early JA performance is important for later ToM in children with ASD or TD

• Early language ability related to later ToM for both groups

• RJA mediated the relationship for ToM and early language, but not later language → language proficiency although necessary, is not sufficient for ToM competency

• JA skills add important understanding to ToM above and beyond individual language ability

• Moreover, concurrent language and ToM were positively correlated suggesting language plays a vital role in ToM development

## REFERENCES

- Mundy, P., Sigman, M., Ungerer, J., & Sherman, T. (1986). Defining the social deficits of autism: the contribution of non-verbal communication measures. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 27(5), 657-669.
- Charman, T., Baron-Cohen, S., Swettenham, J., Baird, G., Cox, A., & Drew, A. (2000). Testing joint attention, imitation, and play as infancy precursors to language and theory of mind. *Cognitive Development*, 15(4), 481-498.
- Nelson, P. B., Adamson, L. B., & Bakeman, R. (2008). Toddlers' joint engagement experience facilitates preschoolers' acquisition of theory of mind. *Developmental Science*, 11(6), 847-852.
- Baron-Cohen, S. (1989). Joint-attention deficits in autism: Towards a cognitive analysis. *Development and Psychopathology*, 1(3), 185-189.
- Naigles, L., & Fein, D. (2017). Looking through their eyes: tracking early language comprehension in ASD. In L. R. Naigles (Ed.) *Innovative Investigations of Language in Autism*, (pp.49-69) New York, NY: APA Books.
- Mullen, E.M. (1995). *Mullen scales of infant development*. Circle Pines, MN: America.
- Test of Auditory Comprehension of Language, Carrow Woolfolk

Grant funding: R01DC016665 and R01 2DC007428 to L. R. Naigles