

# Differentiating among low, medium, and high “um” users with ASD and ADHD

## INTRODUCTION + OBJECTIVE

- “Um” is proposed to serve a listener-oriented function.<sup>1,4</sup>
- Studies have reported that school-aged children on the autism spectrum (ASD) and children with attention deficit/hyperactivity disorder (ADHD) produce fewer “um” tokens than their peers without diagnoses of ASD/ADHD (no diagnosis; ND) in their naturalistic speech.<sup>1,2,3</sup>
- However, not all investigations have reported this difference, and few have examined in depth what contributes to this pattern.<sup>5</sup>

**OBJECTIVE:** To investigate the production of “um” tokens among school-aged children on the spectrum and with ADHD by considering the roles of general language and diagnostic severity as predictors

## METHODS

	ASD (n = 52)	ADHD (n = 24)	ND (n = 22)
Age	11.8 (2.3)	12.0 (2.3)	12.5 (2.3)
ADOS+	10.3 <sup>a</sup> (3.3)	4.6 <sup>b</sup> (3.9)	---
VIQ+ (WASI)	96.2 <sup>a</sup> (15.8)	97.4 <sup>a</sup> (14.1)	110.9 <sup>b</sup> (13.7)

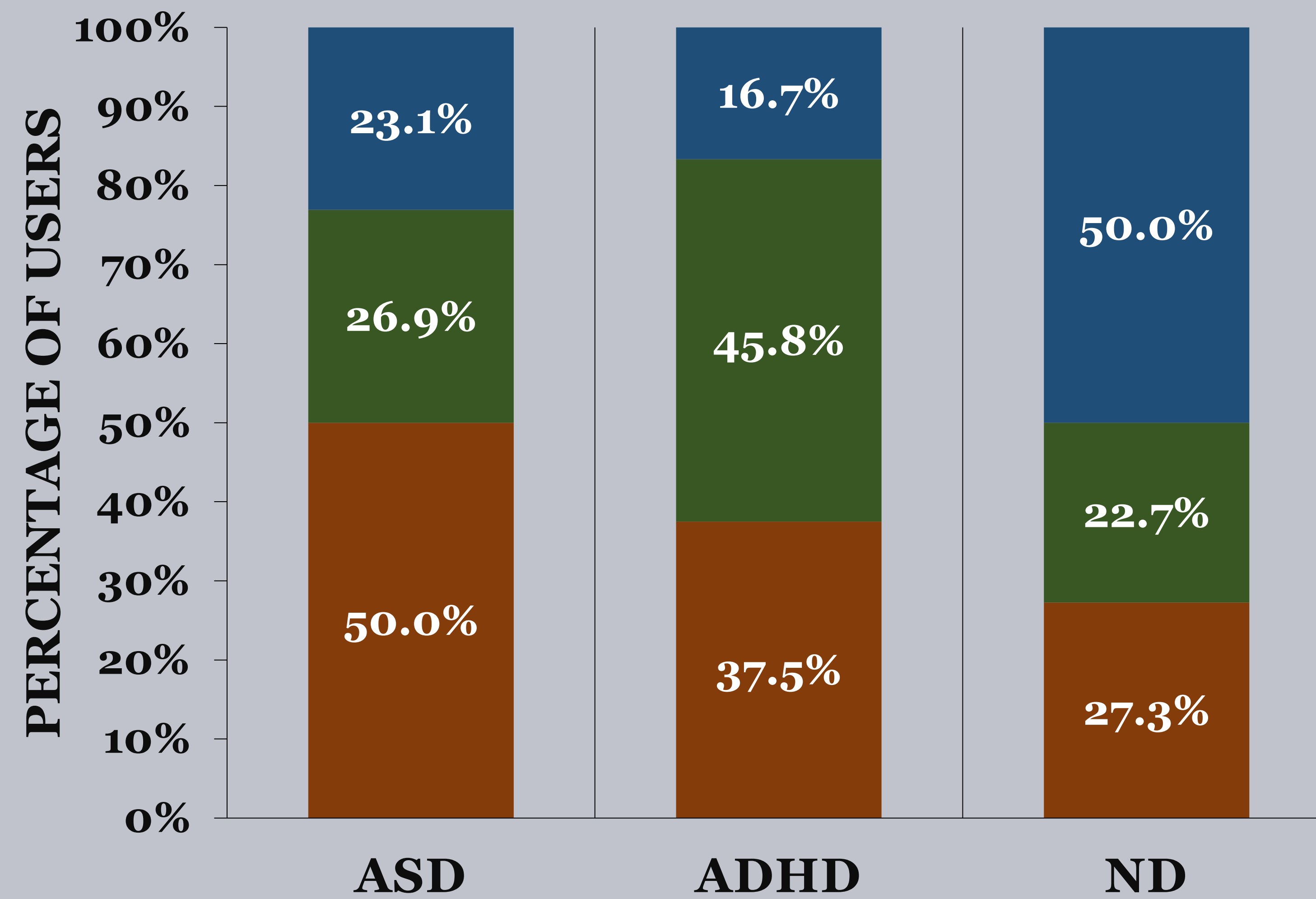
- Virtual reality paradigm: children viewed a classroom and answered questions about their lives (e.g., favorite vacation, holiday, etc.) while addressing avatars
- Audio recordings were transcribed.
  - Proportions of “um” tokens per utterance were computed.
  - 3-way split of “um” users based on all 98 children:
    - **Low:** M = 0 – 0.142
    - **Medium:** M = 0.143 – 0.417
    - **High:** M > 0.418

NOTE: + superscripts of different letters indicate a statistically significant difference

## RESULTS

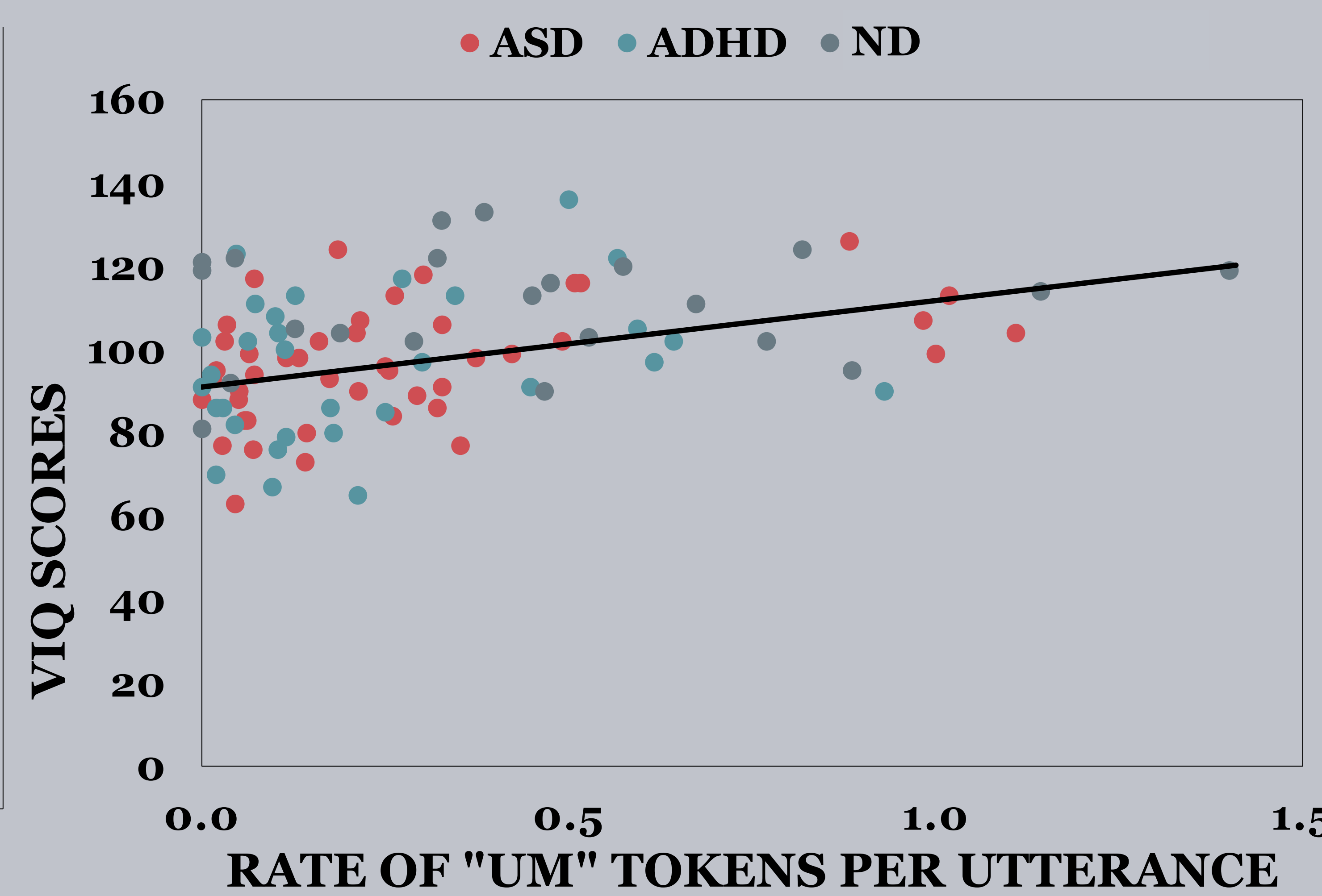
**LOW** “UM” USERS – ASD & ADHD > ND  
**MEDIUM** “UM” USERS – ADHD > ASD & ND  
**HIGH** “UM” USERS – ASD & ADHD < ND

$\chi^2(4) = 10.033, p = 0.040$



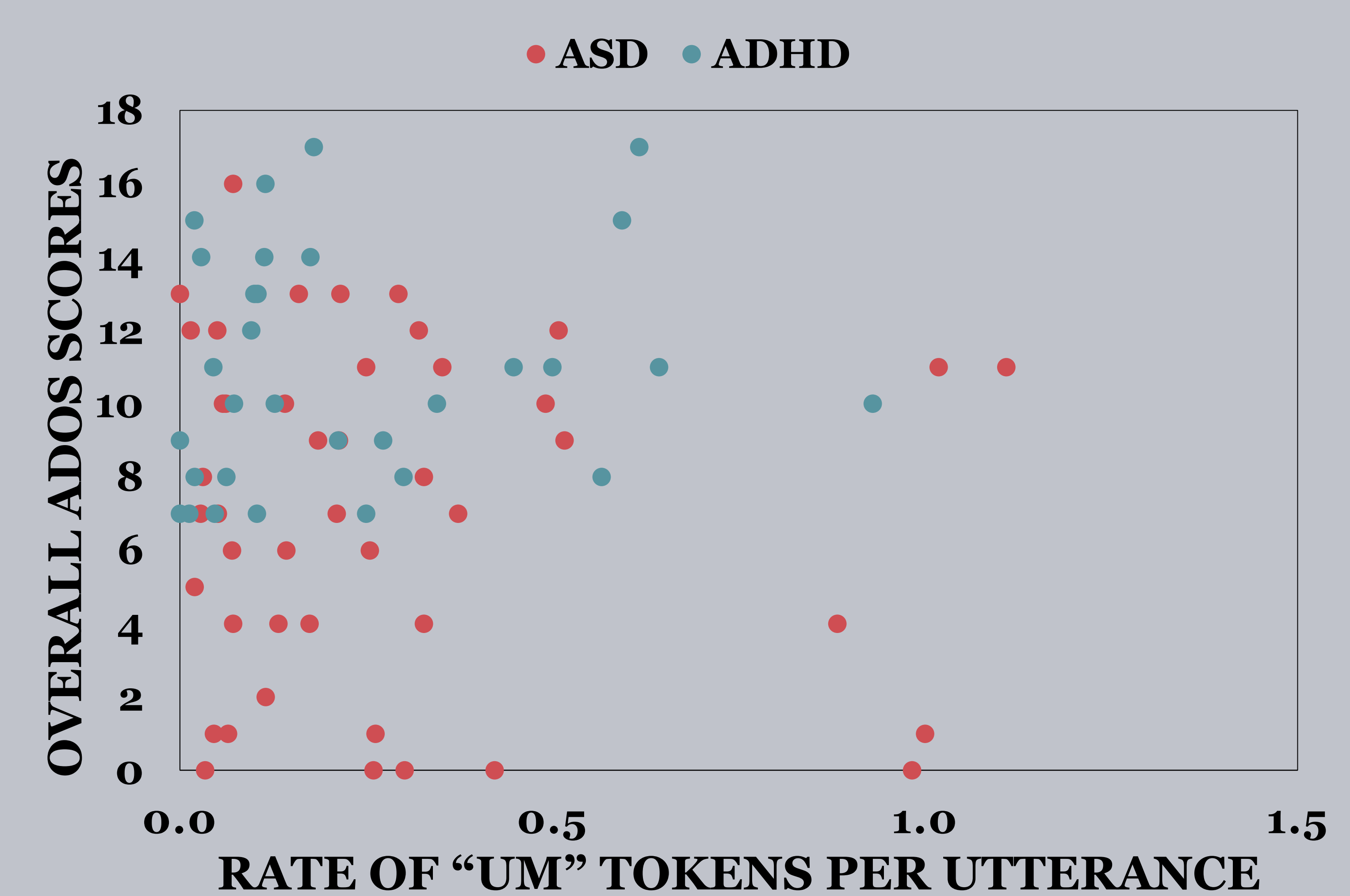
**SIGNIFICANT POSITIVE CORRELATION BETWEEN VIQ AND “UM” RATE FOR ALL CHILDREN**

$r(96) = 0.359, p < 0.001$



**NO SIGNIFICANT CORRELATION BETWEEN ADOS SCORES AND “UM” RATE FOR ASD & ADHD GROUP**

$r(96) = -0.062, p = 0.595$



## DISCUSSION

- Akin to previous studies, school-aged children with ASD and ADHD produced significantly fewer “um” tokens during conversation.
- However, the lack of production of “um” tokens was not associated with autistic characteristics as assessed via the ADOS for the ASD and ADHD groups. Instead, it was associated with **lower verbal abilities**.
- This is also supported by the lower “um” use by the ADHD group, suggesting that this challenge may not be specific to autism.

## REFERENCES + ACKNOWLEDGEMENTS

<sup>1</sup> Irvine et al. (2015). Uh, um, and autism: Filler disfluencies as pragmatic markers in adolescents with optimal outcomes from autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 46, 1061-1070.  
<sup>2</sup> Kuijper et al. (2017). Narrative production in children with autism spectrum disorder (ASD) and children with attention-deficit/hyperactivity disorder (ADHD): Similarities and differences. *Journal of Abnormal Psychology*, 126(1), 63-75.  
<sup>3</sup> Gorman et al. (2016). Uh and um in children with autism spectrum disorders or language impairment. *Autism Research*, 9(8), 854-865.  
<sup>4</sup> Clark, H.H. & Fox Tree, J.E. (2002). Using uh and um in spontaneous speaking. *Cognition*, 84(1), 73-111.  
<sup>5</sup> Boo et al. (2021). Conversation during a virtual reality task reveals new structural language profiles of children with ASD, ADHD, and comorbid symptoms of both. *Journal of Autism and Developmental Disorders*, Online first.

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