Variation in autism and ADHD symptomatology reveals differential uses of discourse markers

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Background

- Some autistic individuals use *"um*," a discourse marker (DM), less often than neurotypical individuals in monologic contexts BUT not in interactive contexts.[1,2,3]
  - **Suggesting mixed impacts of autistic youths' social communication challenges on DM use**
- Scrutiny of other DMs, such as ***"like***," has also revealed comparable rates.[4]
  - *"Like"* is particularly noteworthy – it serves a multitude of functions: a) focusing device *("Like,* we went to Disney"), b) marker of looseness ("I got *like* a hundred presents"), c) quotative marker ("He was *like* 'that was scary'), and d) indicator of reformulation ("I want a new PlayStation, *like*, the newest one").
- However, **little attention has been paid to other DMs aside from *"um"* and *"like"* in autism.**
- Other DMs, such as "***but**,"* also serve more than one function:[5] a) marker of simple contrast ("My brother is older than me, *but* my sister is older than both of us"), and b) violation-of-expectations (V-o-E; "My brother is older than me, *but* he acts like a baby")
- Furthermore, **despite high co-occurrence,[6] few studies have looked at DM use of individuals with co-occurring symptomatology of autism and ADHD (AuDHD).**

OBJECTIVE: To investigate a) more specific uses of DMs, and b) across varying autism and ADHD symptomatology as measured via the ADOS-2[7] and Conners-3[8], respectively

Methods

- Participants had diagnoses of autism and/or ADHD, which were confirmed by research team (**Table 1**).
- Language samples were collected using a virtual reality paradigm where children viewed a classroom as they answered questions about themselves (e.g., "What is a normal day like for you?")
- DMs were identified via utterance-by-utterance coding, and qualitative analyses were conducted to determine the exact function of a DM in a particular utterance.
- Analyses were centered around clusters derived from k-means cluster analysis (based on ADOS-2 and Conners-3 scores) (**Figure 1** & **Table 2**).

Table 1. Demographic information of the sample, M(SD)

	Autistic (n = 18)	ADHD (n = 22)	AuDHD (n = 30)	η^2	Post Hoc
Age	11.3 (1.8)	11.6 (2.4)	11.9 (2.3)	0.013	---
ADOS-2	9.3 (3.3)	4.6 (3.9)	10.8 (3.2)	0.393	Autistic, AuDHD > ADHD
Conners-3	60.3 (6.9)	72.9 (13.1)	80.2 (6.8)	0.434	Autistic < ADHD < AuDHD

Results

Figure 1. Four distinct clusters of participants based on ADOS-2 & Conners-3 scores*

**Based on scaled scores to a mean of 0 and SD of 1*

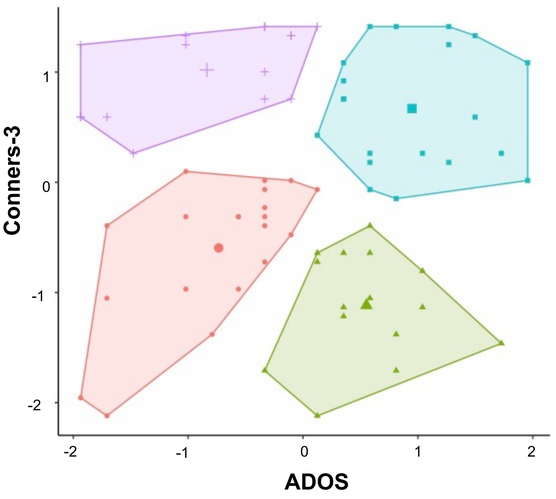


Table 2. Number of children from original diagnostic groups into the four clusters (% of entire sample)

	Cluster Traits	Autism (n = 18)	ADHD (n = 22)	AuDHD (n = 30)
Cluster 1 (n = 20)	↓ Autism, ↓ ADHD	5 (7.1%)	10 (14.3%)	5 (7.1%)
Cluster 2 (n = 15)	↑ Autism, ↓ ADHD	13 (18.6%)	2 (2.9%)	0 (0.0%)
Cluster 3 (n = 20)	↑ Autism, ↑ ADHD	0 (0.0%)	1 (1.4%)	19 (27.1%)
Cluster 4 (n = 15)	↓ Autism, ↑ ADHD	0 (0.0%)	9 (12.9%)	6 (8.6%)

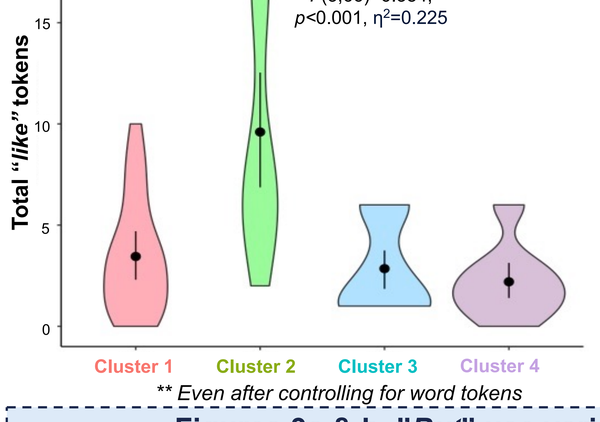
- No significant differences for other DM types, including "*um*," emerged.
- Further, no child in this dataset used "*like*" as a focusing device or marker of looseness.

Figures 2a & b. "*Like*" use varies by autism symptomatology and function

a) Greater AUTISM-only symptomatology → **more *"like"* tokens****

(**C2** > **C3**, **C4**)

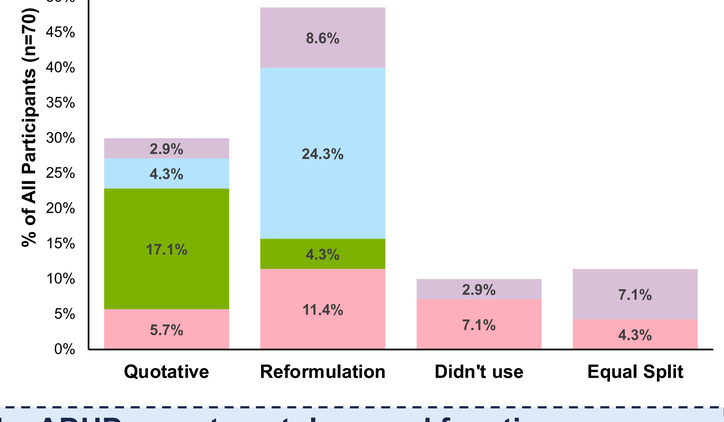
$F(3,66)=6.384$, $p<0.001$, $\eta^2=0.225$



** *Even after controlling for word tokens*

b) **C2**: primarily used *"like"* as quotative

C3: primarily used "*like*" as reformulation

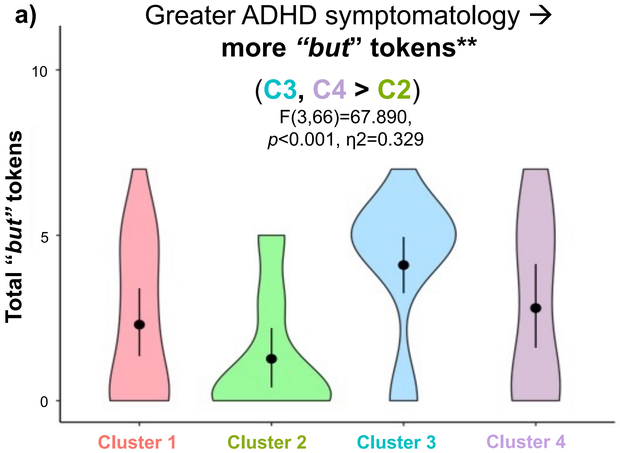


Figures 3a & b. "*But*" use varies by ADHD symptomatology and function

a) Greater ADHD symptomatology → **more *"but"* tokens****

(**C3**, **C4** > **C2**)

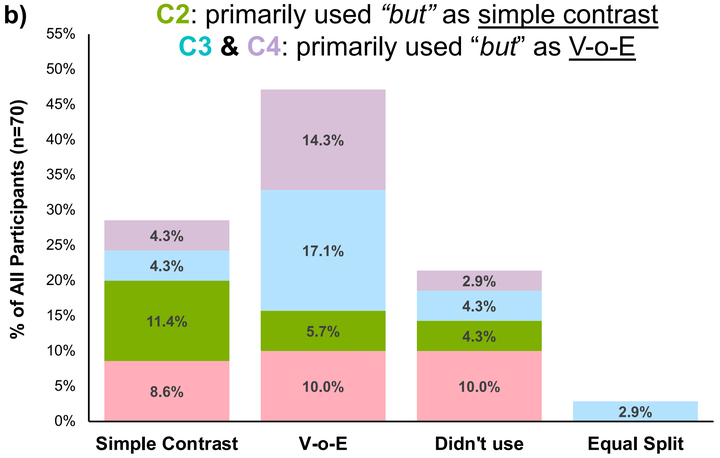
F(3,66)=67.890, $p<0.001$, η2=0.329



** *Even after controlling for word tokens*

b) **C2**: primarily used *"but"* as simple contrast

C3 & **C4**: primarily used "*but*" as V-o-E



Discussion

- Findings revealed that having co-occurring symptomatology of ADHD neither buttressed nor further goaded challenges with DM use among autistic youth, suggesting that **social communication challenges do NOT universally affect DM use (Figures 2a & 3a).**
- Whereas youths with greater autism symptomatology used DMs in a quotative manner, possibly reflecting scripted phraseology, and/or to mark simple contrasts, youths with greater ADHD symptomatology used DMs for reformulation purposes and/or marking a V-o-E (**Figures 2b & 3b**), ***reflecting possible condition-specific behavioral patterns.***

References & Acknowledgments

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