INVESTIGATION ON EXAMINER "UM" AND "UH" USAGE IN ADOS-2 SESSIONS

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BACKGROUND

Studies have found that children with Autism Spectrum Disorder (ASD) use the filler "um" at a significantly lower rate than children with Typical Development (TD), with no difference in "uh" usage. Examiner's filler usage in similar conversational language samples has not been studied. We investigated whether differences in "um" and "uh" usage between ASD and TD children also characterize the speech of their conversational partners: the examiners.

OBJECTIVES

1. Compare examiner usage rates of "um" and "uh" when conversing with ASD vs. TD participants
2. Investigate whether within-group differences in examiner filler usage vary by participant age, intellectual ability, expressive language ability, or autism symptom severity

METHODS

Participants were recruited for an fMRI study at Oregon Health & Science University in Portland, Oregon, USA. The sample consisted of 83 children with ASD (68 male) and 28 children with TD (12 male), for a total of 111. All were 7 to 17 years old, native English speakers, and had full-scale IQ ≥ 70.

Language samples consisted of transcribed Autism Diagnostic Observation Schedule (ADOS-2) Module 3 sessions. Transcription was completed by trained transcribers who were blind to the participants' diagnostic status and intellectual abilities and was in accordance with the Systematic Analysis of Language Transcripts (SALT) guidelines. Four ADOS-2 tasks were chosen for analysis: *Emotions; Social Difficulties and Annoyance; Friends, Relationships, and Marriage; Loneliness.*

We computed three measures of filler usage:

1. *um-rate = total um / total words*
2. *uh-rate = total uh / total words*
3. *um-ratio = total um / (total um + total uh)*

Examiner filler usage rates between diagnostic groups were compared using Wilcoxon-Mann-Whitney tests, with effect sizes calculated using Glass rank biserial correlation coefficients. Associations between examiner *um-rate* and participant-level measures were measured with Kendall rank correlation coefficients, with *p*-values adjusted using the Benjamini-Hochberg procedure to reduce false discovery rate.

RESULTS

There was a significant difference in examiner *um-rate* between ASD and TD (U = 763.0, p < 0.01; ASD < TD), with a medium effect size (r_{pb} = -0.343; Table 1). There was no significant difference in examiner *uh-rate* between ASD and TD (U = 1,038.0, p = .399) or in examiner *um-ratio* (U = 1,017.5, p = 0.369).

Examiner *um-rate* was significantly correlated with both participants' age (τ_b = .280, $p_{adj.}$ < .01) and mean length of utterance in morphemes (MLUM) (τ_b = .0220, $p_{adj.}$ < .05; Table 2). There was no significant correlation between examiner *um-rate* and any of the following participant-level measures: full-scale IQ; number of distinct word roots; Children's Communication Checklist (CCC-2) General Communication Composite, structural language score, pragmatic language score; ADOS-2 Social Affect total, Comparison Score.

	ASD	TD	U	p	r_{pb}
um-rate	0.006 [0.003, 0.009]	0.009 [0.005, 0.013]	763.0	0.007**	-0.343
uh-rate	0.001 [0.001, 0.003]	0.002 [0.001, 0.003]	1038.0	0.399	-0.107
um-ratio	0.775 [0.603, 0.917]	0.775 [0.711, 0.946]	1017.5	0.369	-0.114

Table 1: *Examiner filler usage rates. Median and IQR values are reported for* **um-rate**, **uh-rate**, *and um-ratio. Examiner filler usage rates between diagnostic groups were compared using Wilcoxon-Mann-Whitney Tests (U, p). Effect sizes were calculated using Glass rank biserial correlation coefficients (r_{pb}).*

	ASD	TD
Age	0.280**	0.150
FSIQ	0.140	-0.200
MLUM	0.220*	-0.058
NDWR	0.180	0.150
CCC-2		
GCC	0.130	-0.260
Structural Lang.	0.150	-0.150
Pragmatic Lang.	0.085	-0.270
ADOS-2		
SA	-0.140	0.066
CS	-0.110	0.240

** $p_{adj.}$ < 0.01; * $p_{adj.}$ < 0.05

Table 2: *Correlations between examiner* **um-rate**. *Kendall rank correlation coefficients (τ_b) between examiner um-rate and participant-level measures: age in years; full-scale IQ (FSIQ); mean length of utterance in morphemes (MLUM); number of different word roots (NDWR); CCC-2 General Communication Composite (GCC), structural language score, pragmatic language score; ADOS-2 Social Affect total (SA), Comparison Score (CS). Within-group p-values were adjusted using the Benjamini-Hochberg procedure to reduce false discovery rate.*

CONCLUSIONS

Examiners use the filler "um" significantly less when conversing with children with ASD than with children with TD, which mirrors previous results on participant "um" usage in ASD and TD.

We also found that examiner "um" usage is positively associated with participant age and MLUM but not with more strenuous participant-level measures of expressive language ability and autism symptom severity.

Because analyses did not account for individual differences between examiners, these results should be interpreted with caution. Further analyses that account for examiner-level measures are needed.

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