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Fine tuning the parameters of a new Automated Language Measure

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Abstract

Conversational Reciprocity is the socially expected, back-and-forth nature of a conversation between interlocutors. Clinicians have described conversational differences of children with Autism Spectrum Disorders (ASD), including differences in reciprocity. In this work we developed a novel automated language measure to quantify those differences using natural language processing methods. In a sample of participants aged 7-17 with either ASD (n=66), ADHD (n=36), or TD (n=22) and IQ≥70, we developed an automated assessment of conversational reciprocity using transcripts of ADOS-2 Module 3 administrations as an expressive language sample. For each activity of the ADOS we generated four measures: number of turns (the number of times the speaker changes), number of utterances for each speaker, average turn length (average number of utterances per turn for each speaker, i.e. how long is the speaker talking at a time), and speaker proportion (the proportion of total utterances which belong to the child). We performed non-parametric Kruskal-Wallis ANOVAs between diagnostic groups, followed with Games-Howell post-hoc tests. ASD children “hold the floor” for significantly less time than their TD and ADHD peers during narrative and conversation tasks. For the narrative task ASD children had an average turn length of 2.2 utterances compared to 3.1 for TD and 2.8 for ADHD ($p<0.001$); for conversation tasks ASD children had an average turn length of 1.7 utterances compared to 2 for both TD and ADHD ($p<0.05$). Compared to TD children, examiners spoke significantly more when talking with ASD children during a narrative task: 58 vs. 43 utterances total ($p<0.01$). These preliminary findings align with reports of conversational difficulties between children with ASD and their interlocutors. Possible explanations are under examination.