Assessing Syntax in Fragile X Syndrome: A Comparison Between Standard and Experimental Measures
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Introduction
- Fragile X syndrome is the leading inherited cause of intellectual disability, impacting approximately 1 in every 2,500 males (Hagerman, 2002).
- In terms of syntax, some children demonstrate a profile similar to Specific Language Impairment, with particular difficulties in verb endings (e.g., He walks to the store). However, there is a lack of research on appropriate methods for assessment of these structures.
- A significant number of males have a co-diagnosis of autism (25-40%). Research is mixed on the impact of autism on FXS in terms of the language phenotype (Hattan et al., 2006).
- Thus, the purpose of this study is to 1) characterize the language profile of FXS in terms of syntactic abilities for males with and without autism, and 2) compare different methods for assessment of syntax.

Participant Inclusion Criteria
- FXS: genetic testing to determine full mutation status
- English primary language spoken by the participant
- Spontaneous expressive language of at least 2-3 word utterances
- Boys between 9 and 16 years of age
- Due to the gender differences in FXS, the current study focused only on boys

Method
- Assessments completed at the Waisman Center
- Participants completed norm-referenced tests including nonverbal IQ (Leiter), receptive and expressive vocabulary (PPVT and EVT), expressive syntax (TEGI), the Childhood Autism Rating Scale (CARS) as well as a conversation language sample and sentence imitation task

Primary Measures
- Childhood Autism Rating Scale (CARS; Schopler et al., 2001)
- Scores above 30 considered FXS+Autism
- Test of Early Grammatical Impairment (TEGI; Rice & Wexler, 2001)
- Third Person Singular (3S), Past-tense, and BE/DO Morphological probes
- Percent correct of scorable items in obligatory contexts
- Sentence Imitation Task
  - 3D sentences including target forms of third person singular (3S), Past Tense, BE and DO
  - Percent correct of scorable items in obligatory context

Conclusion
- While nonverbal IQ is similar between the two groups, the boys with FXS-No Autism have much higher language abilities as indexed by the PPVT, EVT, and MLU. Preliminary results indicate a language "advantage" on standardized scores for the FXS-No Autism group.
- The boys with FXS-No Autism had slightly better total scores on the TEGI, although the trend is similar between the two groups. The total scores for the Sentence Imitation Task are strikingly similar. Of note, while BE is a relative strength in this sample, DO appears to be a particularly difficult structure regardless of autism status.
- The error analysis reveals that the boys with FXS-No Autism produced more scorable responses on both the standardized measure and the SIT task. Both groups produced between 60-90% scorable responses on both types of probes.
- This study is ongoing and will continue to enroll participants, as well as examine differences in language on the ADOS and conversation language samples.

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