Methods for Assessing Language for School-Age Children with Autism and Intellectual Disability
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Introduction

- The language phenotype in autism includes delays in language production in the domains of vocabulary, pragmatics and grammar.
- In terms of grammar, 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.
- Boys with fragile X syndrome (FXS) have a similar behavioral phenotype, and a significant number receive a co-diagnosis of autism (25-40%).
- Thus, the purpose of this study is to examine the best assessment method for language in children with autism compared to a group of boys with FXS.

Participant Inclusion Criteria

- Autism: Genetic testing to rule out FXS; 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
- All testing video recorded
- Participants completed norm-referenced tests including nonverbal IQ (Leiter), receptive and expressive vocabulary (PPVT and EVT), expressive syntax (TEGI), the Autism Diagnostic Observation Schedule (ADOS) as well as a conversation language sample and sentence imitation task

Primary Measures

- Test of Early Grammatical Impairment (TEGI; Rice & Wexler, 2001)
  - Third Person Singular (3S), Past-tense (PT), and BE/DO Morphological probes
  - Percent correct in obligatory contexts
- Sentence Imitation Task
  - 30 sentences including target forms of third person singular (3S), Past Tense (PT), BE and DO
  - Percent correct in obligatory context
- MLU derived from a conversational language sample
- The Sentence Imitation Task

Preliminary results indicate high levels of accuracy for 3S and BE on both probes for both groups of participants. Better levels of accuracy for Sentence Imitation task. Perhaps this is due to the autism phenotype. However, a correct response had to include obligatory context. There were some group differences between Autism and FXS, with the Autism group outperforming FXS on almost all of the measures. However, both groups display a similar pattern on 3S and Past Tense, despite differences on IQ and norm-referenced language measures. MLU was similar in the two groups. Study is ongoing and will continue to enroll participants, as well as examine differences in language on ADOS and Conversation Language Sample. Presented at IMFAR 2013 Conference.

Acknowledgments

- We are extremely appreciative of the families who participated in this study and the lab members who worked on this project, without whom our research would not have been possible.
- Thank you to Jill Hoover for her comments/edits.
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- We are grateful for the support from the Waisman Center Core Grant (P30 HD03332, M. Mailick, PI).

Table: Correlations

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group</th>
<th>Autism (n = 6)</th>
<th>FXS (n = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronological Age (years)</td>
<td>Mean</td>
<td>12.60</td>
<td>12.53</td>
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<tr>
<td></td>
<td>SD</td>
<td>2.27</td>
<td>2.26</td>
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<tr>
<td>Leiter (standard score)</td>
<td>Mean</td>
<td>72.83</td>
<td>46.33</td>
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<tr>
<td></td>
<td>SD</td>
<td>13.21</td>
<td>7.83</td>
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<tr>
<td>EVT (standard score)</td>
<td>Mean</td>
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<td>62.83</td>
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<tr>
<td></td>
<td>SD</td>
<td>18.75</td>
<td>12.98</td>
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<tr>
<td>PPVT (standard score)</td>
<td>Mean</td>
<td>78.17</td>
<td>60.94</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>20.09</td>
<td>14.11</td>
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<tr>
<td>ADOS Diagnosis</td>
<td>Autism</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>ASD</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

*Significant at .05 level; **Significant at .01 level; +Significant at .06

<table>
<thead>
<tr>
<th>Method</th>
<th>Autism</th>
<th>FXS</th>
</tr>
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<tbody>
<tr>
<td>TEGI 3S</td>
<td>.19</td>
<td>.85</td>
</tr>
<tr>
<td>TEGI Regular PT</td>
<td>.51</td>
<td>.37</td>
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<tr>
<td>TEGI Irreg PT</td>
<td>.45</td>
<td>.34</td>
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<tr>
<td>TEGI BE</td>
<td>.28</td>
<td>.26</td>
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<tr>
<td>MLU</td>
<td>.04</td>
<td>.68</td>
</tr>
<tr>
<td>ADOS Diagnosis</td>
<td>Autism</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>ASD</td>
<td>1</td>
</tr>
</tbody>
</table>

1Leiter International Performance Scale-Revised (Roid & Miller, 1997)
2Expressive Vocabulary Test (Williams, 2007)
3Adapted Picture Vocabulary Test (Dunn & Dunn, 1997)
4Autism Diagnostic Observation Schedule (Lord et al., 1997)

Results

- 3S Regular PT
- 3S Irregular PT
- 3S BE
- 3S DO

Conclusions

- Preliminary results indicate high levels of accuracy for 3S and BE on both probes for both groups of participants. Better levels of accuracy for Sentence Imitation task. Perhaps this is due to the autism phenotype. However, a correct response had to include obligatory context.
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