Conversational and Narrative Grammatical Abilities of Adolescents and Young Adults with Developmental Disabilities

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University of Minnesota, Twin Cities

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MIND Institute at the University of California, Davis

Acknowledgements

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Grammatical Profiles

• Expressive grammatical ability is particularly difficult for individuals with Down syndrome (DS) or fragile X syndrome (FXS).

• It is unclear if there are distinct between-syndrome differences in grammatical abilities that would suggest unique DS and FXS behavioral phenotypes.

Grammatical Profiles

<table>
<thead>
<tr>
<th></th>
<th>FXS &gt; DS</th>
<th>FXS = DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversational Language</td>
<td>MLU: Finestack et al., 2013; Kover &amp; Abbeduto, 2010</td>
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<td>Complex Syntax</td>
<td>Hogan-Brown et al., 2013</td>
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<td>IPSyn</td>
<td>Price et al., 2008</td>
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Index of Productive Syntax (IPSyn; Scarborough, 1990)

• Evaluates the emergence of 56 syntactic and morphological forms

• First 100, successive, intelligible utterances

• Exclude: imitations, self-repetitions, and routines

IPSyn

- Noun Phrases (12)
  - Two-word NP
  - Modified NP

- Verb Phrases (17)
  - Prepositional Phrase
  - Progressive –ing

- Questions / Negations (11)
  - Negative morpheme
  - Yes/no question

- Sentence Structure (20)
  - Subject-verb sequence
  - Relative clause
FXS & DS IPSyn Profiles

Conversational Language Performance (Price et al., 2008)*

<table>
<thead>
<tr>
<th>Scale</th>
<th>DS vs. FXS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun Phrases</td>
<td>FXS&gt;DS</td>
</tr>
<tr>
<td>Verb Phrases</td>
<td>FXS&gt;DS</td>
</tr>
<tr>
<td>Questions/Negations</td>
<td>FXS&gt;DS</td>
</tr>
<tr>
<td>Sentence Structure</td>
<td>FXS=DS</td>
</tr>
<tr>
<td>Total</td>
<td>FXS&gt;DS</td>
</tr>
</tbody>
</table>

*controlling for maternal education and nonverbal MA

Current Study

Do adolescents with FXS use a greater variety of syntactic forms in narrative and conversational language than adolescents with DS?

Language Samples

- Counterbalanced Conversational Language
  - Elicited using standardized questions and topics
  - What’s your teacher’s name? Tell me about the things that you do with your teacher.

Participants

- Documentation of trisomy 21 for DS group and full mutation for FXS group
- No more than a mild hearing loss
- English only language spoken by the participant
- No evidence of autism

Participants' Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>FXS (n = 10)</th>
<th>DS (n = 20)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronological Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(years)</td>
<td>Mean SD</td>
<td>Min-Max</td>
<td></td>
</tr>
<tr>
<td>12.08-19.74</td>
<td>15.05 2.44</td>
<td>12.18-19.74</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonverbal Mental Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(years)</td>
<td>Mean SD</td>
<td>Min-Max</td>
<td></td>
</tr>
<tr>
<td>3.36-7.11</td>
<td>4.54 1.00</td>
<td>3.56-7.11</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonverbal IQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.13-6.41</td>
<td>39.30 3.33</td>
<td>41.10 6.45</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female:Male</td>
<td>0:10</td>
<td>8:12</td>
<td></td>
</tr>
</tbody>
</table>
Repeated ANOVA (Context x Dx)

• IPSyn based on first 50 utterances

Noun Phrase
Verb Phrase
Questions/Negation
Sentence Structure

Con - FXS
Con - DS
Nar - FXS
Nar - DS

IPSyn Score

0
5
10
15
20
25
30

Con - FXS
Con - DS
Other - FXS
Other - DS

Repeated ANOVA (Context x Dx)

• IPSyn based on first 50 utterances

Noun Phrase
Verb Phrase
Questions/Negation
Sentence Structure

Con - FXS
Con - DS
Nar - FXS
Nar - DS

IPSyn Score

0
5
10
15
20
25
30

Con - FXS
Con - DS
Other - FXS
Other - DS

Repeated ANOVA (Context x Dx)

• MLUm based on all utterances

Con - FXS
Con - DS
Nar - FXS
Nar - DS

MLU

0
1
2
3
4
5
6
7

Con - FXS
Con - DS
Other - FXS
Other - DS

Current Study

Do adolescents with FXS use a greater variety of syntactic forms in narrative and conversational language than adolescents with DS?

NO

Why lack of replication?

Too few utterances?

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<tr>
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<th>DS = 20</th>
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<tr>
<td>Chronological Age (years) Mean</td>
<td>15.14</td>
<td>15.81</td>
<td>.55</td>
</tr>
<tr>
<td>SD</td>
<td>2.57</td>
<td>3.37</td>
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<tr>
<td>Min-Max</td>
<td>11.38-19.74</td>
<td>10.24-21.84</td>
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<tr>
<td>Nonverbal Mental Age (years) Mean</td>
<td>4.07</td>
<td>4.02</td>
<td>.80</td>
</tr>
<tr>
<td>SD</td>
<td>0.58</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Min-Max</td>
<td>3.86-4.94</td>
<td>3.75-4.94</td>
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<tr>
<td>Nonverbal IQ Mean</td>
<td>33.29</td>
<td>33.72</td>
<td>.31</td>
</tr>
<tr>
<td>SD</td>
<td>2.54</td>
<td>2.76</td>
<td></td>
</tr>
<tr>
<td>Min-Max</td>
<td>30-40</td>
<td>28-40</td>
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<td>Gender Female:Male</td>
<td>0:13</td>
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Conversational Language

Why lack of replication? Developmental differences?

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Participant Comparison

Current Study
- 12-19 CA
- 3-7 MA
- MLU: 2.65-10.00

Price et al.
- 2-16 CA
- 2-8 MA
- MLU: mean = ~3.45

Kover et al.
- 10-17 CA
- 3-7 MA
- MLU: 1.32-7.37

Conclusions

Adolescents with FXS or DS do not appear to have different syntactic profiles in terms of structures used, based on conversational and narrative language samples.

Narrative samples included more complex verb structures, but conversational samples included a greater variety of structures.

IPSyn may be most sensitive to detecting differences in the syntactic profiles of children with small MLUs.

Measures of grammatical accuracy may be more sensitive to detecting profile differences of older children with larger MLUs.