The relationship between narrative proficiency and syntactic complexity of spontaneously generated stories elicited from children with Autism Spectrum Disorder as compared to those elicited from children with Specific Language Impairment

Megan Israelsen (megan.israelsen@aggiemail.usu.edu), Samantha Winward (samantha.winward@aggiemail.usu.edu), Sandra Gillam (sandi.gillam@usu.edu)
Disclosure

- The intervention used in this experiment was developed through funding awarded by the Institute of Education Sciences (R324A100063)

- Disclosures:
  - Samantha Winward & Megan Israelsen have no financial or nonfinancial disclosures to report
  - Sandra Gillam receives royalties from the intervention program used in the project
Narrative Proficiency

SLI
- Shorter and simpler in global organization of stories
- Less-diverse vocabulary
- Limited literate language features (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004; McFadden & Gillam, 1996; Newman & McGregor, 2006)

ASD
- Lack coherent global organization (Tager-Flusberg & Sullivan, 1995; Diehl, Bennetto & Young, 2006)
- Contain fewer causal connections (Diehl, Bennetto & Young, 2006)
- Difficulty using pronouns to establish local coherence (Novogrodsky, 2012)
Syntactic Complexity

SLI
- Significant impairment in syntactic complexity marked by lack of relative clauses (Kim & O’ Grady, 2015)
- Use less complex sentences (Domsch, Richels, Saldana, Coleman, Wimberly, & Maxwell, 2012)

ASD
- Some studies indicate that syntax is specifically impaired (Eigsti, Marchena, Schuh, & Kelley, 2010; Banny, Harper-Hill & Arnott, 2014)
- Other studies find that syntax may not be impaired (Shulman & Guberman, 2007)
Introduction

● Two studies were conducted to investigate the impact of a narrative intervention program on narrative proficiency and syntactic complexity.

● The first study was conducted with 6 children with SLI.

● The second study was conducted with 5 children with ASD.
Method

- A manualized narrative intervention was used (Supporting Knowledge in Language and Literacy: SKILL; Gillam, Gillam, & Laing-Rogers, 2014).
  - Designed to allow the participants to participate in therapy at their own rate.
- Intervention was implemented twice a week for each participant in each study after baseline.

- **SLI study: Multiple Baselines Single-subject Across Participants**
  - 4 boys and 2 girls between the ages of 6-10
- **ASD study: Multiple Baseline Single-subject Across Participants**
  - 3 boys and 2 girls between the ages of 8-10

- Treatment sessions ranged from 13-24
- Treatment sessions ranged from 14-33
Dependent Variables

● Narrative Proficiency
  ○ *Monitoring Indicators of Scholarly Language* (MISL; Gillam, Gillam, Fargo, Olszewski & Segura, 2017)
  ○ Range of scores 0-39

● Syntactic Complexity
  ○ Subordination Index
    ■ Ratio of independent clauses to the number of C-units (i.e. independent main clauses and phrases/clauses subordinated to it)
  ○ Percent of Complex Sentences
    ■ Percentage of utterances within stories that have two or more clauses
SLI - Narrative Proficiency

02 MSL

06 MSL

03 MSL

07 MSL
ASD - Narrative Proficiency

001 MSL

002 MSL

003 MSL

004 MSL

005 MSL
SLI - Control: Subordination Index

01 SUBORDINATION INDEX

04 SUBORDINATION INDEX
SLI - Subordination Index

02 SUBORDINATION INDEX

06 SUBORDINATION INDEX

03 SUBORDINATION INDEX

07 SUBORDINATION INDEX

SI - Subordination Index
SLI - Control: Complex Sentences

**01 COMPLEX SENTENCES**

**04 COMPLEX SENTENCES**
SLI - Complex Sentences

02 COMPLEX SENTENCES

06 COMPLEX SENTENCES

03 COMPLEX SENTENCES

07 COMPLEX SENTENCES
ASD - Complex Sentences

001 COMPLEX SENTENCES

002 COMPLEX SENTENCES

003 COMPLEX SENTENCES

004 COMPLEX SENTENCES

005 COMPLEX SENTENCES
<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline TNU</th>
<th>Baseline # CS</th>
<th>Intervention TNU</th>
<th>Intervention # CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 - SLI</td>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04 - SLI</td>
<td>21</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 - SLI</td>
<td>20</td>
<td>2</td>
<td>102</td>
<td>8</td>
</tr>
<tr>
<td>03 - SLI</td>
<td>9</td>
<td>1</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>06 - SLI</td>
<td>6</td>
<td>0</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>07 - SLI</td>
<td>6</td>
<td>0</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>001 - ASD</td>
<td>29</td>
<td>7</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>002 - ASD</td>
<td>7</td>
<td>0</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>003 - ASD</td>
<td>16</td>
<td>3</td>
<td>39</td>
<td>8</td>
</tr>
<tr>
<td>004 - ASD</td>
<td>21</td>
<td>2</td>
<td>38</td>
<td>6</td>
</tr>
<tr>
<td>005 - ASD</td>
<td>10</td>
<td>0</td>
<td>29</td>
<td>4</td>
</tr>
</tbody>
</table>

CS: Complex Sentences
TNU: Total Number of Utterances
Discussion

SLI

- MISL 3 of 4 made significant improvement in narrative
- SI 3 of 4 began with SI scores at or above GL
- All 4 ended intervention with SI scores at or above GL
- 0 of 4 began using sufficiently complex language (20% or higher)
- 3 of 4 ended intervention using sufficiently complex language (20% or higher)

ASD

- MISL 4 of 5 made significant improvement in narrative
- SI 3 of 5 began with SI scores at or above GL
- All 5 ended intervention with SI scores at or above GL
- 3 of 5 began using sufficiently complex language (20% or higher)
- All 5 ended intervention using sufficiently complex language (20% or higher)
SLI

- Children in the SLI group began intervention with significantly lower MISL scores than kids in ASD and ended intervention with high scores (but somewhat lower than those of children in the ASD group)
- Children in SLI group did not use sufficiently complex utterances in their stories at baseline, and all did at end of intervention.
- The use of complex sentences was lower even after intervention, than scores for children with ASD who had higher language abilities (n = 3)

ASD

- 3 of 5 began intervention at a higher language level than kids in the SLI group and the two other children in the ASD group (on all measures)
- MISL scores at end of intervention were very high (21 or above)
- The 2 children in the ASD group with lower language skills, looked similar, or worse than the children with SLI and responded to treatment in a similar fashion to the children with SLI
References