PART I: PREDICTING RECEPTIVE-EXPRESSIVE VOCABULARY DISCREPANCIES IN PRESCHOOL CHILDREN WITH AUTISM SPECTRUM DISORDER

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Delayed Versus Deviant Language Development

Receptive-Expressive Discrepancies

Previously Evaluated Predictors

<table>
<thead>
<tr>
<th>Study</th>
<th>Age (ASD)</th>
<th>Language Measure(s)</th>
<th>NVIQ</th>
<th>ASD Severity</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davidson &amp; Ellis Weismer, 2017</td>
<td>30 – 66 months</td>
<td>PLS-3 and PLS-4 standard score</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Haebig &amp; Sterling, 2017</td>
<td>9 – 16 years</td>
<td>PPVT-4 and EVT-2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hudry et al., 2010</td>
<td>24 – 59 months</td>
<td>MCDI</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Kover et al., 2013</td>
<td>4 – 11 years</td>
<td>PPVT and EVT</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kwok et al., 2015</td>
<td>Multiple</td>
<td>Multiple</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>
Theoretically Motivated and Potentially Malleable Predictors

<table>
<thead>
<tr>
<th>Theoretical support</th>
<th>Expected direction of discrepancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention Towards a Speaker</td>
<td>Receptive vocabulary smaller than expected</td>
</tr>
<tr>
<td>Oral Motor Performance</td>
<td>Receptive vocabulary larger than expected</td>
</tr>
</tbody>
</table>

(Thechwaranka et al., 2012; Norbury et al., 2009; Schoen et al., 2011; Shriberg et al., 2011; Tenenbaum et al., 2015; Watson et al., 2010; Young et al., 2009)

Research Question

Does (a) attention towards a speaker and/or (b) oral motor performance predict the typicality of receptive-expressive vocabulary size discrepancies 8 months later in children with ASD?

Participants

- 65 children with ASD from Yoder, Watson, and Lambert (2015) sample

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronological Age (months)</td>
<td>M</td>
</tr>
<tr>
<td>43.46</td>
<td>7.16</td>
</tr>
<tr>
<td>MB-CDI Words Understood raw score</td>
<td>110</td>
</tr>
<tr>
<td>MB-CDI Words Said raw score</td>
<td>17</td>
</tr>
<tr>
<td>MB-CDI Words Understood AE (months)</td>
<td>12.52</td>
</tr>
<tr>
<td>MB-CDI Words Said AE (months)</td>
<td>13.48</td>
</tr>
</tbody>
</table>

Quantifying Typicality

- Need to index the degree to which the receptive-expressive vocabulary size discrepancy is atypically small or atypically large
- Comparison sample from the 128 English-speaking 14-month-old children in the Wordbank (wordbank.stanford.edu)

\[
\text{discrepancy score} = \frac{\text{mean TD discrepancy score}}{\text{SD for TD discrepancy score}}
\]
**Smaller Than Expected Mean Discrepancy Identified**

- Mean receptive-expressive discrepancy size z-score = -0.46, $SD = 1.09$
- Significantly different than zero: $t(64) = -3.368, p = .001$

**Observed Individual Variation**

Mean = -0.46  
$SD = 1.09$  
Range = -1.70 – 3.69

**Significant Association Between Attention Towards a Speaker and Vocabulary Size Discrepancy Typicality**

$r(56) = .33, p = .01$

**Secondary Analyses: Receptive Vocabulary Size as Mediator**

$\beta = .40^{***}$  
$\gamma = .40^{***}$  
$\beta = .20$

**Secondary Analyses: Expressive Vocabulary Size as Mediator**

$\beta = .20$

$\gamma = .24$
Non-Significant Associations Between Oral Motor Performance and Vocabulary Size Discrepancy Typicality

| Imitative | .10 | .45 |
| Nonimitative | .09 | .49 |

Discussion

<table>
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<tr>
<th>Attention Towards a Speaker</th>
<th>Oral Motor Performance</th>
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<tr>
<td>Theoretical support</td>
<td>Speech-attunement framework</td>
</tr>
<tr>
<td>Expected direction of discrepancy</td>
<td>Receptive vocabulary smaller than expected</td>
</tr>
</tbody>
</table>

References

Reciprocal Vocal

Vocal Reciprocity – Part II:

- Vocal Contingency (RVC)

References


Part II:

A New Measure of Vocal Reciprocity – Reciprocal Vocal Contingency

Vocal Reciprocity

Calculating RVC

\[ \text{RVC} = \frac{a}{a + b} - \frac{c}{c + d} \]

References

Example Event Stream

![Example Event Stream Diagram]

Calculating RVC

\[ \text{RVC} = \frac{a}{a+b} - \frac{c}{c+d} \]

![Calculating RVC Diagram]

Key Features of RVC

- Dyadic
- Three-event contingency
- Provides temporal context for the sequential association
- Independent of chance sequencing of child and adult vocalizations
- Automated nature increases efficiency
- Automated nature may reduce risk of bias

Key References