Screening for Dyslexia and Specific Language Impairment in Second Grade Classrooms

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Introduction

- SLI and dyslexia are relatively common learning disabilities.
- SLI affects ~ 7% of children (Tomblin et al., 1997)
- Prevalence estimates of dyslexia generally range between 5-10% (e.g., Siegel, 2006).
- Children who have either SLI or dyslexia may be less likely to be referred for formal evaluation than children who have both (Catts, Adol, Hogan, 2005).
- Universal screening can help to improve early identification, but individually administered screenings can be costly.
- The purpose of this study is to examine the utility of brief classroom screenings for identifying children who may have Specific Language Impairment (SLI) and/or dyslexia.

Participants

- 737 children from 37 classrooms in two South Carolina school districts completed classroom screenings.
- ~200 children completed follow up assessments.
- Analyses include 165 children who had complete data for all assessments.

Screening Process

Each classroom was given a 20-25 minute whole classroom assessment. Tests included:
- Test of Silent Word Reading Fluency (3 minutes) (TOSWRF; Mather, Hammill, Allen, Roberts, 2004)
- GRADE Listening Comprehension (10-15 minutes) (GRADE; Tomblin, & Secord, 2003)
- Test of Word Reading Efficiency-2 (TOWRE-2; Nagy, & Secord, 2003)
- Clinical Evaluation of Language Fundamentals-4 (CELF-4; Semel, Wig, & Secord, 2003)

Diagnostic Process

- Parent questionnaire to confirm inclusion/exclusionary criteria
  - Monolingual
  - No history of hearing impairment, uncorrected visual impairment, or neurological disorder
- Test of Word Reading Efficiency-2 (TOWRE-2; Torgesen, Wagner, & Rashotte, 2010) used to identify children with dyslexia using a -1 SD criterion
- Clinical Evaluation of Language Fundamentals-4 (CELF-4; Semel, Wig, & Secord, 2003) used to identify children with SLI, using a -1 SD criterion

Descriptive Statistics

Pre-screening for all children (n=737)

<table>
<thead>
<tr>
<th>Test of Silent Word Reading Fluency (TOSWRF)</th>
<th>GRADE Listening Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical N=103</td>
<td>Typical N=165</td>
</tr>
<tr>
<td>TOSWRF Standard Score</td>
<td>TOSWRF Standard Score</td>
</tr>
<tr>
<td>TOWRE SS</td>
<td>TOWRE SS</td>
</tr>
<tr>
<td>TOSWRF SS</td>
<td>TOSWRF SS</td>
</tr>
<tr>
<td>Grade Stanine</td>
<td>Grade Stanine</td>
</tr>
<tr>
<td>CELF-4 SS</td>
<td>CELF-4 SS</td>
</tr>
<tr>
<td>False Positive Rate (1 - Specificity)</td>
<td>False Positive Rate (1 - Specificity)</td>
</tr>
<tr>
<td>Area under the curve (AUC)</td>
<td>Area under the curve (AUC)</td>
</tr>
</tbody>
</table>

Correlations

<table>
<thead>
<tr>
<th>TOSWRF SS</th>
<th>Grade Stanine</th>
<th>TOWRE SS</th>
<th>CELF-4 SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1</td>
<td>.334</td>
<td>.684</td>
<td></td>
</tr>
<tr>
<td>.334</td>
<td>1</td>
<td>.271</td>
<td></td>
</tr>
<tr>
<td>.684</td>
<td>.271</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>.507</td>
<td>.470</td>
<td>.574</td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.01 level

ROC Curves

- TOSWRF vs. GRADE
- TOSWRF vs. CELF-4
- TOSWRF vs. TOWRE

Area under the curve (AUC)

- TOSWRF = .507
- Grade Stanine = .639
- TOWRE = .819
- CELF-4 = .757

False Positive Rate (1 - Specificity)

- TOSWRF = .310
- Grade Stanine = .684
- TOWRE = .307
- CELF-4 = .271

SLI and dyslexia are relatively common learning disabilities. The purpose of this study is to examine the utility of brief classroom screenings for identifying children who may have Specific Language Impairment (SLI) and/or dyslexia. Each classroom was given a 20-25 minute whole classroom assessment. Tests included: Test of Silent Word Reading Fluency (3 minutes) (TOSWRF; Mather, Hammill, Allen, Roberts, 2004), GRADE Listening Comprehension (10-15 minutes) (GRADE; Tomblin, & Secord, 2003), Test of Word Reading Efficiency-2 (TOWRE-2; Nagy, & Secord, 2003), and Clinical Evaluation of Language Fundamentals-4 (CELF-4; Semel, Wig, & Secord, 2003) used to identify children with SLI, using a -1 SD criterion. The diagnostic process included a parent questionnaire to confirm inclusion/exclusionary criteria. The current sample size is small; thus, results should be interpreted with caution. We will test for replication using data from new participants recruited in the next school year.

Discussion & Future Directions

- There is a strong positive correlation between TOWRE and TOSWRF scores and a moderate positive correlation between CELF-4 and GRADE LC scores.
- ROC curves suggest that the TOSWRF is a good predictor of dyslexia and that the GRADE LC is a fair predictor of SLI. Interestingly, the TOSWRF performed better as a predictor of SLI than the GRADE LC.
- Both screeners required accepting a relatively high number of false positives in order to flag all children with dyslexia or SLI.
- Overall, these findings suggest that brief classroom screeners such as the TOSWRF and GRADE LC may provide more cost-efficient means of flagging children with dyslexia and/or SLI than individually-administered assessments, but more research is needed.

- The current sample size is small; thus, results should be interpreted with caution. We will test for replication using data from new participants recruited in the next school year.
- Additional analyses are planned which will incorporate measures of non-timed word reading accuracy and dialect variation to increase the reliability and validity of the index classification of dyslexia and SLI.

References


Acknowledgements

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