Silent Contextual Reading Fluency Validity

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PRO-ED, Inc.

The Test of Silent Contextual Reading Fluency (TOSCRF) (Hammill, Wiederholt, & Allen, 2006) is a quick measure of reading ability which is composed of an Examiner’s Manual and four equivalent forms (A, B, C, D). The test can be administered in 10 minutes and provides raw scores, standard scores, percentiles, and age/grade equivalents. It was normed on a representative sample of 1,898 students ranging from 7 years, 0 months to 18 years, 11 months in age who each were administered all four forms of the TOSCRF. These students resided in 23 states. The TOSCRF can be used by classroom teachers, special education teachers, reading specialists, school psychologists, speech pathologists, or any other persons who have some training in standardized test administration.

The TOSCRF measures the speed with which a student can identify words in a series of printed passages, in which all spaces and punctuation have been removed. Students are given 3 minutes to draw lines between as many words as possible. Each form can be administered to one student or to an entire classroom in approximately 10 minutes.

Scoring the TOSCRF begins with the last row the student attempted and continues backwards until the point at which the student has correctly identified all the words in one passage or until all words have been scored. A word is correctly identified when a line is clearly drawn separating the word from another word. The student receives credit for all the words from Passage 1 to the completely correct passage and is awarded one point for each word correctly identified after that correct passage. When a student does not indentify all the words correctly in any of the attempted passages, the total TOSCRF raw score is the total number of correctly identified words. Using the student’s raw score, the examiner can derive a percentile rank, standard score, descriptive rating of the test’s standard score, and age and grade equivalents.

Since the publication of the TOSCRF, seven studies have correlated this test to well-known criterion reading measures. The demographic characteristics of the samples used in these studies are described in Table 1.

These studies have examined the relationship of the TOSCRF to the following measures:

- *Gray Oral Reading Test—Fourth Edition* (GORT-4) (Wiederholt & Bryant, 2001)
- *Group Reading Assessment and Diagnostic Evaluation* (GRADE) (Williams, 2001)
- *Test of Silent Reading Efficiency and Comprehension* (TOSREC) (Wagner, Torgesen,
Measuring Silent Contextual Reading Fluency

- Test of Silent Word Reading Fluency (TOSWRF) (Mather, Hammill, Allen, & Roberts, 2004)
- Test of Word Reading Efficiency (TOWRE) (Torgesen, Wagner, & Rashotte, 1999)
- Wide Range Achievement Test, Third Edition (WRAT-3) (Wilkinson, 1993)

This presentation summarizes this research and provides three types of evidence: (a) a review of correlation coefficients showing the relationship between TOSCRF and the criterion measures, (b) a comparison of the means of the TOSCRF and those of the criterion measures, and (c) the results of a series of binary classification analyses.

The results, reported in Tables 2 through 4 and Figure 1, indicate: (1) that the TOSCRF possesses a Large to Very Large relationship with the criterion measures; (2) that for all practical purposes, regardless of the samples’ characteristics or the criterion test administered, the standard scores that result from administering the TOSCRF will be similar to those obtained from administering the criterion tests; (3) that the TOSCRF is highly predictive of reading ability.

In summary, professionals recognize the critical role fluency plays in reading proficiency (Kuhn & Stahl, 2003; National Reading Panel, 2000; Wolf, 2001). The TOSCRF incorporates many essential comprehension abilities, including word identification, word meaning (vocabulary), word building (morphology), sentence structure (syntax), and relational meaning (comprehensions). Mastery of these abilities enable the student to mentally “chunk” printed phrases, anticipate the writer’s intentions, and automatize words, phrases, and sentences, all of which are necessary for the development of fluent (i.e., accurate and speedy) silent reading of contextual material. While the validation of a measure is always ongoing, the data presented here indicate that the TOSCRF is a promising new measure of reading ability which adds significantly to the assessment of children’s reading ability, to the prediction of reading performance across multiple domains (fluency, comprehension, sight recognition), and to directing of interventions (particularly at younger ages when such identification is critical to remediation).

References


Table 1 *Characteristics of the Four Samples Used in the Validity Studies*

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<tr>
<th>Study and criterion test</th>
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<th>4</th>
<th>5</th>
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<td>GORT-4, SAT-9</td>
<td>TOSWRF</td>
<td>TOWRE</td>
<td>TOSWRF, WRAT-III, WJ III</td>
<td>GRADE, TOSREC, TOSWRF, TOWRE, WJ III</td>
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<td>243</td>
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<td>8-15</td>
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<td>212</td>
<td>42</td>
<td>50</td>
<td>NR</td>
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### Study and criterion test

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<th>TOSWRF</th>
<th>TOWRE</th>
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*Note. NR = not reported.*
Table 2 Corrected (and Uncorrected) Coefficients Representing the Relationship Between TOSCRF Forms and Criterion Reading Measures

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<th>Criterion Reading Tests</th>
<th>Score</th>
<th>Type of Reading</th>
<th>Study</th>
<th>n</th>
<th>TOSCRF Forms</th>
<th>Average&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Magnitude&lt;sup&gt;b&lt;/sup&gt;</th>
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<td>.67 (.47)</td>
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<td>SAT-9</td>
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<td>Gen</td>
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<td>.65 (.45)</td>
<td>.64 (.47)</td>
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<td>TOSWRF</td>
<td>Silent Reading Fluency</td>
<td>WI, F</td>
<td>3</td>
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<td>.81 (.71)</td>
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<td>F</td>
<td>4</td>
<td>42</td>
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<td>.78 (.55)</td>
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<td>WI, F</td>
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<td>Criterion Reading Tests</td>
<td>Score</td>
<td>Type of Reading</td>
<td>Study</td>
<td>n</td>
<td>TOSCRF Forms</td>
<td>Average&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Magnitude&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>TOAL-4</td>
<td>Written Language</td>
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<td>7</td>
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<td>.71</td>
<td>.74</td>
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<sup>Note.</sup> Gen = general reading; WI = word identification; F = fluency; Comp = comprehension; Dec = decoding. Blank spaces in the table indicate that the researcher did not report the data or that it was otherwise unavailable. Values in the parentheses are observed correlation coefficients; all others are corrected for attenuation due to range restriction and reliability of the criterion. All coefficients are significant at the <i>p < .0001</i> level.

<sup>a</sup>Fisher’s average of the corrected coefficients across samples.

<sup>b</sup>Magnitude of the averaged corrected coefficients; based on Hopkins’s (2002) criteria for interpreting correlation coefficients.
Table 3

*Standard Score Means (and Standard Deviations) and Related Statistics for the TOSCRF and Criterion Tests*

<table>
<thead>
<tr>
<th>TOSCRF/criterion test</th>
<th>Score</th>
<th>Study</th>
<th>n</th>
<th>Mean  (SD)</th>
<th>Descriptive Terms</th>
<th>t</th>
<th>Effect Size</th>
<th>Magnitudea</th>
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<tr>
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<td>1</td>
<td>134</td>
<td>99  (12)</td>
<td>Average</td>
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<td>7.06</td>
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<td>-0.48</td>
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<td>n</td>
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<td>Descriptive Terms</td>
<td>t</td>
<td>Effect Size</td>
<td>Magnitude&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>(12)</td>
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<td>(15)</td>
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<td>TOSCRF</td>
<td>Silent Reading Fluency</td>
<td>6</td>
<td>1,667</td>
<td>92 (12)</td>
<td>Average</td>
<td>-9.62***</td>
<td>0.16</td>
<td>Small</td>
</tr>
<tr>
<td>TOWRE</td>
<td>Sight Word Reading</td>
<td>96</td>
<td>(12)</td>
<td>Average</td>
<td></td>
<td></td>
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<td>TOSCRF</td>
<td>Silent Reading Fluency</td>
<td>6</td>
<td>1,632</td>
<td>91 (12)</td>
<td>Average</td>
<td>-12.62***</td>
<td>0.22</td>
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<tr>
<td>TOWRE</td>
<td>Total Score</td>
<td>97</td>
<td>(15)</td>
<td>Average</td>
<td></td>
<td></td>
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<tr>
<td>TOSCRF</td>
<td>Silent Reading Fluency</td>
<td>6</td>
<td>1,668</td>
<td>92 (12)</td>
<td>Average</td>
<td>-13.29***</td>
<td>0.22</td>
<td>Small</td>
</tr>
<tr>
<td>WJ III</td>
<td>Letter-Word Identification</td>
<td>98</td>
<td>(14)</td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>TOSCRF</td>
<td>Silent Reading Fluency</td>
<td>6</td>
<td>1,668</td>
<td>92 (12)</td>
<td>Average</td>
<td>2.41**</td>
<td>0.04</td>
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<tr>
<td>WJ III</td>
<td>Passage Comprehension</td>
<td>91</td>
<td>(12)</td>
<td>Average</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>TOSCRF</td>
<td>Silent Reading Fluency</td>
<td>6</td>
<td>1,667</td>
<td>92 (12)</td>
<td>Average</td>
<td>-16.84***</td>
<td>0.28</td>
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<tr>
<td>WJ III</td>
<td>Word Attack</td>
<td>99</td>
<td>(12)</td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOSCRF/ criterion test</td>
<td>Score</td>
<td>Study</td>
<td>n</td>
<td>Mean (SD)</td>
<td>Descriptive Terms</td>
<td>t</td>
<td>Effect Size</td>
<td>Magnitude&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------</td>
<td>-------</td>
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</tr>
<tr>
<td>TOSCRF</td>
<td>Silent Reading Fluency</td>
<td>7</td>
<td>140</td>
<td>105 (14)</td>
<td>Average</td>
<td>2.48</td>
<td>** 0.15</td>
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<td>TOAL-4</td>
<td>Written Language</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Median TOSCRF Score</td>
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<td>1-7</td>
<td>192</td>
<td>92 (12)</td>
<td>Average</td>
<td>-2.58</td>
<td>* 0.16</td>
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</tr>
<tr>
<td>Median Criterion Score</td>
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<td></td>
<td></td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Magnitude of the effect size based on Hopkins’s (2002) criteria for interpreting correlation coefficients.

* $p < .05$
** $p < .01$
*** $p < .001$
Table 4
Binary Classification Matrix Demonstrating TOSCRF’s Ability to Predict Reading Ability

<table>
<thead>
<tr>
<th>TOSCRF</th>
<th>Reading Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below average</td>
</tr>
<tr>
<td>Below average</td>
<td>188 True positives</td>
</tr>
<tr>
<td>Average or above</td>
<td>31 False negatives</td>
</tr>
</tbody>
</table>

N = 765; Percent agreement = .84; Sensitivity index = .86; Specificity index = .84; Positive predictive value = .68; Negative predictive value = .94.

Figure 1
Results of the ROC analysis.

ROC Curve

Area Under the Curve

Test Result Variable(s): TOSCRFSS

<table>
<thead>
<tr>
<th>Area</th>
<th>Std. Error(a)</th>
<th>Asymptotic Sig.(b)</th>
<th>Asymptotic 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>.925</td>
<td>.010</td>
<td>.000</td>
<td>.905</td>
</tr>
</tbody>
</table>

a Under the nonparametric assumption
b Null hypothesis: true area = 0.5