Evaluating technical adequacy of DIBELS in a New Zealand sample of early elementary students

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The use of formative assessment for educational decision making in cross-cultural contexts

Chantal Dufour-Martel, Chair
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Acknowledgments

The participants:
• Children
• Families
• Staff of participating schools

Faculty colleagues, especially:
Elaine Reese
Mele Taumoepeau

Department of Psychology

Paul Thorsnes
Department of Economics

Student researchers and research assistants:
Abigail Pigden
Helen Owen
Kathryn McLennan
Ryan Abraham,
and especially…

Pip Struthers
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• Opinions expressed herein do not necessarily reflect the position of funding agencies, and such endorsements should not be inferred.
Similarities between the literacy contexts in NZ and the US speak to roles for formative assessment tools.

Hobbs 2003
• Ranked highly in literacy attainment
• Documented marked variation in achievement
• Similar proportions of young people reading at the highest and lowest levels (14.5%)
Potential Roles for Assessment in New Zealand

- 8 claims for enhancing literacy levels with a significant body of supporting evidence
  - These include claims that specifically relate to *assessment*:
    - *Detect early*
    - *Maximize chances of detection for early identification of all at-risk students*
    - *Determine a student’s strengths and weaknesses*
    - *Provide on-going assessment and support*
Potential Uses of Assessment for Educational Decision Making in NZ

- 8 claims for enhancing literacy levels with a significant body of supporting evidence
  - The remaining claims...
    - Intervene early
    - Increase intensity
    - Instruct in phonological awareness and phonics at an early age
    - Teach focused on individual learner needs

...have implications for using assessment information to differentiate instruction
Each new intended use of a measure needs to be empirically evaluated. Technical adequacy evidence is sample specific. 

1Christ & Hintze 2007; 2AERA, APA, NCME 1999
Contextual Differences in NZ Potentially Relevant to Assessment of Developing Literacy Skills

- **Structure of beginning schooling**
  - 5th birthday, rather than beginning of school year
- **Curriculum**
- **Language**
  - Differences in vowel production patterns
  - Differences in speaking rates when reading from connected text

Small scale field trials are recommended to evaluate whether literacy measures developed elsewhere are appropriate to the NZ context.

1. Smith & Elley 1997
2. Robb, Maclagan & Chen 2004
3. Croft et al. 2000
Results to Date

• DIBELS correlate with:
  – School used measures and judgments\textsuperscript{1,2}
  – Researcher administered criterion measures in Grade 4\textsuperscript{3} \& 5\textsuperscript{4}
  – Future performance on DIBELS tasks\textsuperscript{1,2,3,4, 5}

• Growth mixture models with FSF progress monitoring data suggest potential patterns of typical development and risk in kindergarten\textsuperscript{6}

\textsuperscript{1} Schaughency \& Suggate 2007; \textsuperscript{2} Schaughency \& Suggate 2008; \textsuperscript{3} McKay, Ervin, Schaughency, Suggate \& Tong 2008; \textsuperscript{4} Schaughency, Suggate, \& Tustin, 2010, \textsuperscript{5} Struthers, Schaughency, Suggate, Clarke \& Thurlow 2010; \textsuperscript{6} Schaughency, Clarke, Struthers, Beretvas in preparation
This research extends previous research by...

- Examining relations to external criterion measures to period of reading acquisition (K to Grade 2)
- Examining technical adequacy issues specifically relevant to progress monitoring, e.g.,
  - alternate forms reliability
  - predictive validity of ideographic (within student) change
- Illustrating formative assessment
Participants: The Schools

• Four primary schools in two small urban areas in NZ
  – Socioeconomic characteristics of the school communities were generally similar
    • Ministry of Education assigned deciles ranged from 3 - 4 (low - moderately low)
  – Schools varied by:
    • Demographic composition
      School samples:
      – New Zealand European: Ranged from 56% - 94%
      – Māori: Ranged from 3% - 39%
    • Participation rate
      – Ranged from 32% - 76%
Participants: The Children

<table>
<thead>
<tr>
<th>Year</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>57</td>
</tr>
<tr>
<td>2010</td>
<td>136</td>
</tr>
<tr>
<td>2011</td>
<td>168</td>
</tr>
</tbody>
</table>

- Same grade samples were combined for within year analyses (Stewart & Silberglitt, 2008).
- Subsamples followed for longitudinal analyses.

US/Canadian terminology is used to refer to school year to communicate with a North American audience and for consistency with DIBELS manuals.
Measures:

Dynamic Indicators of Basic Early Literacy Skills (DIBELS) [https://dibels.uoregon.edu/] 6th edition

- Reviewed, selected, and modified for cultural appropriateness (e.g., color → colour)
- 2 rather than 3 passages administered as part of larger research protocol
- First Sound Fluency was substituted for Initial Sound Fluency
## Data Collection

<table>
<thead>
<tr>
<th></th>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Participants</td>
<td>B1</td>
<td>B2 (End)</td>
<td></td>
<td>B3</td>
</tr>
<tr>
<td>Some Kindergarten</td>
<td></td>
<td>FSF 2X per week</td>
<td>PSF/NWF 2X per week</td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- With typical samples
- With at-risk samples

When ready to move on, data analysis to do.

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*FSF: 2X per week*  
*PSF/NWF: 2X per week*
Reliability Issues

• Administered by trained psychology graduate students
  – Required to achieve > 90% IRR with native speaker of NZ English

• Language measures
  (e.g., WUF, Retell Fluency)
  – Audio recorded, transcribed, coded/analysed using Systematic Analysis of Language Transcripts (SALT) software
  – Correlations with in vivo scoring, e.g.,
    • WUF .93 (K, B2)
    • Retell .85 - .86 (Gr 1, B2)
Reliability Issues

• Alternate form reliability
  – 2X/week monitoring progress of subsample. Correlations within week, e.g.
    • **FSF** .86 - .97 (K, Term 2, at-risk sample)
    – 2 ORF Passages administered at each data collection point.
    • **ORF** .96 (Grade 1) - .98 (Grade 2)
    • **Retell** .78 (Grade 1) - .62 (Grade 2)
    • Average of two probes used in analyses.
### Criterion Validity: WUF and PPVT4

<table>
<thead>
<tr>
<th>WUF assessed:</th>
<th>Concurrent</th>
<th>Predictive to…</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Grade 1</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>.48</td>
<td>.17</td>
</tr>
<tr>
<td>Grade 1</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>Grade 2</td>
<td>.44</td>
<td></td>
</tr>
</tbody>
</table>

*K* B2 WUF correlates with exposure to schooling and PPVT in Grade 1.

**Peabody Picture Vocabulary Test - 4**
- Administered Term 2 2011, raw scores
- Correlations with B2 WUF
- Partial correlations, controlling for exposure to schooling
- *p < .01*, unless otherwise noted
• Administered Term 4 2011 only
• Broad Reading Cluster, comprised of:
  Word Attack
  Word Identification
  Word Comprehension
  Passage Comprehension
• Correlations with B3 DIBELS
  controlling for exposure to schooling
  \( p < .05 \), unless otherwise noted

CRITERION VALIDITY: WOODCOCK READING MASTERY TEST – REVISED NORMATIVE UPDATE
## Criterion validity: WRMT-R/NU Broad Reading

<table>
<thead>
<tr>
<th>DIBELS Assessed:</th>
<th>Concurrent</th>
<th>Predictive to...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kindergarten</strong></td>
<td>( n = 45 )</td>
<td><strong>Grade 1</strong> ( n = 63 )</td>
</tr>
<tr>
<td>WUF</td>
<td>.34</td>
<td>.46</td>
</tr>
<tr>
<td>PSF</td>
<td>.62</td>
<td>.50</td>
</tr>
<tr>
<td>LNF</td>
<td>.78</td>
<td>.69</td>
</tr>
<tr>
<td>NWF</td>
<td>.84</td>
<td>.58</td>
</tr>
<tr>
<td><strong>Grade 1</strong></td>
<td>( n = 55 )</td>
<td></td>
</tr>
<tr>
<td>WUF</td>
<td>.28</td>
<td></td>
</tr>
<tr>
<td>PSF</td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>NWF</td>
<td>.68</td>
<td></td>
</tr>
<tr>
<td>ORF</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td>ORF Retell</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td><strong>Grade 2</strong></td>
<td>( n = 36 )</td>
<td></td>
</tr>
<tr>
<td>WUF</td>
<td>.44</td>
<td></td>
</tr>
<tr>
<td>ORF</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>ORF Retell</td>
<td>.54</td>
<td></td>
</tr>
</tbody>
</table>

At end of K, predictive relation of PSF holds across time.

By end of G1, no predictive relation of PSF.
Findings of significant correlations extend the criterion-related validity evidence for DIBELS tasks during reading acquisition in NZ context.

Findings of differing relations over time point to need for a developmental perspective.
Validity Issues: Need for Developmental Mediation Models

Step 1: Beginning K FSF

Step 2: Beginning K FSF

β = .58

Beginning Grade 1 NWF

β = .60

End Grade 2 WRMT-R/NU

β = .23, p = 08

End Grade 2 WRMT-R/NU
### Social Validity Issue:
School Used Measures and Judgments

<table>
<thead>
<tr>
<th>Collected alongside DIBELS</th>
<th>Beginning</th>
<th>Middle</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Book Level</td>
<td>Book Level</td>
<td>Book Level School Concern</td>
</tr>
<tr>
<td>Grade 1</td>
<td>Book Level</td>
<td>Book Level</td>
<td>Book Level* School Concern</td>
</tr>
<tr>
<td>Grade 2*</td>
<td>[Book Level]</td>
<td>[Book Level]</td>
<td>[Book Level] School Concern</td>
</tr>
</tbody>
</table>

**National Standards specify two criteria for literacy achievement for early elementary students:**

- *Book level targets after 1, 2, and 3 years of school*
- *Overall teacher judgment (above, at, below, well-below expectations)*

**Book level:**

- *The level of text at which children read with greater than 90 – 95% accuracy.*
- Possible range: 0 – 30. *Some participating schools discontinued book levels after the 3 year target of 22; therefore > 22 recoded to 23.*
Criterion validity: Six Year Net

<table>
<thead>
<tr>
<th>Grade 1 B2 DIBELS</th>
<th>Book Level&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Observation Survey Subtests</th>
<th>Burt</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WUF</td>
<td>.42</td>
<td>.24</td>
<td>.40</td>
</tr>
<tr>
<td>PSF</td>
<td>.23</td>
<td>.15 (ns)</td>
<td>.31</td>
</tr>
<tr>
<td>NWF</td>
<td>.73</td>
<td>.63</td>
<td>.65</td>
</tr>
<tr>
<td>ORF</td>
<td>.81</td>
<td>.64</td>
<td>.72</td>
</tr>
<tr>
<td>ORF Retell</td>
<td>.55</td>
<td>.57</td>
<td>.52</td>
</tr>
</tbody>
</table>

**Six Year Net:**
- Assessment after one year of school
- Administered around 6<sup>th</sup> birthday

Partial correlations controlling for exposure to schooling, p < .05 unless otherwise noted.
# Predictive validity: Six Year Net

<table>
<thead>
<tr>
<th>K B1 DIBELS</th>
<th>Book Level&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Observation Survey Subtests</th>
<th>Burt</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 113</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WUF</td>
<td>.27</td>
<td>.22</td>
<td>.21</td>
</tr>
<tr>
<td>FSF</td>
<td>.60</td>
<td>.49</td>
<td>.53</td>
</tr>
<tr>
<td>LNF</td>
<td>.71</td>
<td>.57</td>
<td>.56</td>
</tr>
</tbody>
</table>

**Six Year Net:**
- **Assessment after one year of school**
- **Administered around 6<sup>th</sup> birthday**

Partial correlations controlling for exposure to schooling

All p’s < .05
## Predicting Book Level 
### Across Kindergarten

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WUF</strong></td>
<td>To what extent do Mary and Joe differ in book level as a function of...</td>
<td>To what extent does Mary’s book level increase as a function of an increase in...</td>
</tr>
<tr>
<td></td>
<td>Important for screening decisions</td>
<td>Important for progress monitoring decisions</td>
</tr>
<tr>
<td><strong>LNF</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LNF + WUF</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Cross-sectional time-series regression (STATA 11.0 SE)
- All p’s < .01, unless otherwise noted (*p < .05)

- Individually each task predicts variation in outcome.
- Combined LNF & WUF contribute uniquely.
Predicting Book Level Across Kindergarten

<table>
<thead>
<tr>
<th>Predicting Variation in Outcomes</th>
<th>Predicting Variation in Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>between Children</strong></td>
<td><strong>within Children</strong></td>
</tr>
<tr>
<td>Between-estimator uses the time averages for both predictor and outcome ignores change over time focuses on differences between cases</td>
<td>Fixed effects estimator cancels out the role of other fixed (individual difference) factors that contribute to performance estimates contribution of change in predictor to change in outcome (Woolridge 2003).</td>
</tr>
</tbody>
</table>

\[
\tilde{y}_{it} = \beta_1 \tilde{x}_{i1} + \beta_2 \tilde{x}_{i2} + \ldots, \ t = 1,2,\ldots T, \text{ where } \\
\tilde{y}_{it} = y_{it} - \bar{y}_t \text{ and } \tilde{x}_{it} = x_{it} - \bar{x}_i
\]

- Cross-sectional time-series regression (STATA 11.0 SE)
- All \( p \)'s < .01, unless otherwise noted (*\( p < .05 \))
- Individually each task predicts variation in outcome.
- Combined LNF & WUF contribute uniquely.
## Predicting Book Level Across Kindergarten

### Predicting Variation in Outcomes between Children

<table>
<thead>
<tr>
<th>Task</th>
<th>$R^2$</th>
<th>Slope Coefficient (SE)</th>
<th>95% Confidence Interval</th>
<th>$t$</th>
<th>$R^2$</th>
<th>Slope Coefficient (SE)</th>
<th>95% Confidence Interval</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>WUF</td>
<td>.25</td>
<td>.17 (.02)</td>
<td>.12 - .21</td>
<td>7.87</td>
<td>.31</td>
<td>.19 (.02)</td>
<td>.16 - .22</td>
<td>11.45</td>
</tr>
<tr>
<td>LNF</td>
<td>.53</td>
<td>.17 (.01)</td>
<td>.15 - .19</td>
<td>14.76</td>
<td>.47</td>
<td>.26 (.02)</td>
<td>.23 - .29</td>
<td>16.00</td>
</tr>
<tr>
<td>LNF + WUF</td>
<td>.54</td>
<td>.15 + .04*</td>
<td>.15 + .04*</td>
<td>.19</td>
<td>.53</td>
<td>.21 + .10</td>
<td>.21 + .10</td>
<td>.31</td>
</tr>
</tbody>
</table>

### Predicting Variation in Outcomes within Children

- **Cross-sectional time-series regression (STATA 11.0 SE)**
- All $p$'s < .01, unless otherwise noted (*$p$ < .05)
- **Individually each task predicts variation in outcome.**
- **Combined LNF & WUF contribute uniquely.**

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[University of Otago logo]
### Predicting Book Level

**Beginning to Middle** of Kindergarten

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient (SE) 95% Confidence Interval</td>
</tr>
<tr>
<td>FSF</td>
<td>.19</td>
<td>.12 (.02) 0.08 - .15</td>
</tr>
<tr>
<td>LNF + FSF</td>
<td>.50</td>
<td>.13 + .01 ns .14</td>
</tr>
</tbody>
</table>

- **Cross-sectional time-series regression (STATA 11.0 SE)**
- $p$’s < .01, unless otherwise noted (*$p$ < .05; †$p$ < .10)
- **Individually FSF predicts variation in outcome.**
- **Combined, results for oral language measures vary by analysis,**
  - adding to the prediction of within child change.
## Predicting Book Level
### Beginning to Middle of Kindergarten

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient (SE)</td>
</tr>
<tr>
<td>FSF</td>
<td>.19</td>
<td>.12 (.02)</td>
</tr>
<tr>
<td>LNF + FSF + WUF</td>
<td>.51</td>
<td>.13 + .01 ns</td>
</tr>
</tbody>
</table>

- **Cross-sectional time-series regression (STATA 11.0 SE)**
- $p$'s < .01, unless otherwise noted (*$p < .05$; †$p < .10$)
- **Individually FSF predicts variation in outcome.**
- **Combined, results for oral language measures vary by analysis,**
  - adding to the prediction of within child change.
Predicting Book Level

**Middle to End** of Kindergarten

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient (SE) 95% Confidence Interval</td>
</tr>
<tr>
<td>PSF</td>
<td>.26</td>
<td>.16 (.02) .12 - .20</td>
</tr>
<tr>
<td>NWF</td>
<td>.58</td>
<td>.15 (.01) .13 - .16</td>
</tr>
<tr>
<td>NWF + LNF</td>
<td>.62</td>
<td>.09 + .09 .18</td>
</tr>
</tbody>
</table>

Individually PSF and NWF predict variation in outcome.

- Combined, results vary by analysis
- PSF adding to the prediction of within child change.
## Predicting Book Level: Middle to End of Kindergarten

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient ($SE$)</td>
</tr>
<tr>
<td>PSF</td>
<td>.26</td>
<td>.16 (.02)</td>
</tr>
<tr>
<td>NWF</td>
<td>.58</td>
<td>.15 (.01)</td>
</tr>
<tr>
<td>NWF + LNF + PSF + WUF</td>
<td>.64</td>
<td>.09 + .08 + PSF doesn’t add + .04*</td>
</tr>
</tbody>
</table>

Individually PSF and NWF predict variation in outcome.

- Combined, results vary by analysis
- PSF adding to the prediction of within child change.

If no PSF, WUF adds
Predicting Book Level *Across* Grade 1

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient (SE)</td>
</tr>
<tr>
<td>WUF</td>
<td>.35</td>
<td>.20 (.03)</td>
</tr>
<tr>
<td>PSF</td>
<td>.17</td>
<td>.15 (.03)</td>
</tr>
<tr>
<td>NWF</td>
<td>.56</td>
<td>.11 (.01)</td>
</tr>
<tr>
<td>NWF + WUF</td>
<td>.61</td>
<td>.09 + .09</td>
</tr>
</tbody>
</table>

*Individually WUF, PSF, and NWF predict variation in outcome.*

- Combined results vary by analysis
- Either PSF or WUF add to NWF

*PSF doesn’t add to WUF*
## Predicting Book Level Across Grade 1

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient ($SE$)</td>
</tr>
<tr>
<td>WUF</td>
<td>.35</td>
<td>.20 (.03)</td>
</tr>
<tr>
<td>PSF</td>
<td>.17</td>
<td>.15 (.03)</td>
</tr>
<tr>
<td>NWF</td>
<td>.56</td>
<td>.11 (.01)</td>
</tr>
<tr>
<td>NWF + PSF</td>
<td>.59</td>
<td>.10 (.07)</td>
</tr>
</tbody>
</table>

Individually WUF, PSF, and NWF predict variation in outcome.

- Combined results vary by analysis
- Either PSF or WUF add to NWF
- PSF doesn’t add to WUF
### Predicting Book Level

**Mid to End Grade 1**

<table>
<thead>
<tr>
<th></th>
<th>Predicting Variation in Outcomes between Children</th>
<th>Predicting Variation in Outcomes within Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>Slope Coefficient ($SE$)</td>
</tr>
<tr>
<td>ORF</td>
<td>.68</td>
<td>.09 (.01)</td>
</tr>
<tr>
<td>Retell</td>
<td>.47</td>
<td>.18 (.02)</td>
</tr>
<tr>
<td>ORF + Retell</td>
<td>.70</td>
<td>.08 + .05</td>
</tr>
<tr>
<td>ORF + Retell + WUF</td>
<td>.71</td>
<td>.08 + .04†</td>
</tr>
</tbody>
</table>
Today’s results thus far...

- Big ideas

**Big Idea 1.** Because learning and development imply change over time, what is evidence based assessment will also change.

**Big Idea 2.** Different types of evidence are needed to support different purposes of assessment.
The Moving Target of Literacy Development

<table>
<thead>
<tr>
<th>Year 1</th>
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<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
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</thead>
<tbody>
<tr>
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<td>Reading to learn</td>
<td>Reading for meaning</td>
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</tbody>
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- Oral language skills
  - Phonological awareness
  - Alphabetic principle
  - Decoding unfamiliar text

- Cross-sectional time-series analyses extend support for indicators of early literacy and language skills and curriculum-based measures of reading in the New Zealand context, predicting both *between* and *within* children over time.
- ‘Within’ analyses were generally more sensitive to detecting unique contributions of measures with an *oral language* component.
- Sensitivity of predictor *and* outcome measures may influence obtained findings.
Validity Issues: Need for Developmental Mediation Models

Onset phoneme awareness contributes to developing decoding skills. 

$\beta = .58$ 

$\beta = .60$ 

$\beta = .23, p = .08$ 

$\beta = .77$
Although children differ in their starting point, they converge over the term. Lack of achievement may be an indicator of risk for children in Class 2.

Growth mixture modelling suggests 2 developmental patterns for phonological awareness skills across Term 2.

- The typical pattern, shown above, shows varying skill levels at the beginning of the term, with convergence over the term.
- The intercept for the second pattern is considerably lower, with limited growth across the term, potentially suggesting developmental risk.

Schaughency, Clarke, Struthers & Beretvas in progress
Sample Progress Monitoring Results

2 students with BL = 1

Tipene Baseline
Progress Monitoring Term 1

Blake Baseline
Progress Monitoring Term 1

From Struthers, Schaughency, Reese 2011
Findings of change in trend with supplemental support suggests sensitivity of FSF to treatment effects. Book level findings speak to need to also consider literacy skills necessary to apply PA to reading (Case 2).
The Moving Target of Literacy Development

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- Oral language skills
- Developing early literacy skills
  - Phonological awareness
  - Alphabetic principle
  - Decoding unfamiliar text

- Extend support for indicators of early literacy skills, language, and curriculum-based measures of reading in the New Zealand context
- Future research is needed to empirically examine practice issues relating to use of formative assessment measures in New Zealand, issues such as:
  - Appropriate cut-scores and indices for decision-making
  - Factors related to uptake & instructional validity
Thank You
References


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