Implementing Effective Reading Interventions in Schools: Alignment of Tier 1 and Tier 2 Interventions

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Evidence-based Instructional Practices Are Known


- IES’s WWC practice guide on foundational reading skills (2016):
  --Professional Learning Community materials and videos available from REL Southeast
  --MOOC-Ed available from the Friday Institute at NC State University
A minimal level of evidence does not mean that a recommendation isn’t important. It means that more rigorous research is needed in the area.
Yet, Achievement Levels are Worrisome

- NAEP 2015 Reading: About 1/3 of 4th grade (36%) and 8th grade (34%) students perform at or above proficient.

- Minnesota is above the nation’s average in 4th & 8th grade reading in 2015 (39% and 40% at or above proficient, respectively), but scores decreased in both grades compared to 2013.

- Score gaps remain in Minnesota for Black and Hispanic students compared to White students and students on FRL.
Common Obstacles

- Poverty & racial prejudice & lack of political will
- Lack of respect for K-12 teaching
- Lack of scientifically-based SEA/LEA reading policy
- Lack of evidence-based instruction in preservice & inservice
- Personal beliefs trump the scientific method
- Theoretically incoherent & non-evidence-based instructional materials
- Lack of systemic approach to multi-tiered intervention

Poverty & racial prejudice & lack of political will can be addressed by:
  - sharing the tax wealth (e.g., FL’s districts are the county, not smaller administrative units as in most other states)
  - Incentivize teachers to work in low-performing schools
  - Integrate SES groups through distributed housing plans and educational innovations (e.g., magnet schools, IB programs; charters)

Lack of respect for K-12 teaching has led to brain drain to higher paying professions. Therefore, weaker students going into teacher education. Need to raise beginning teacher salaries, raise standards for admission to teacher ed programs, retain teachers by rewarding effectiveness and innovation.

Lack of scientifically-based SEA/LEA reading policy: state/district reading plans need to be based on the science of reading and there need to be incentives for thoughtful and timely completion and accountability and recognition for success (i.e., proficiency levels and reduction of achievement gaps).

Personal beliefs trump the scientific method: Reward student achievement gains in K-12 teachers. Universities need to hire faculty to teach the reading certification courses who demonstrate knowledge & skills to teach evidence-based practices. State reading certification exams need to be rigorous and based on the science of reading.

Instructional materials for teaching reading must be based on scientific evidence (Foorman et al., 2004). REL SE rubric for evaluating K-5 ELA instructional materials.

Systemic approach to multi-tiered intervention: General ed and special ed teachers, specialists, and administrators need to work together to articulate RtI.
See National Implementation Research Network website for information about implementation science.
REL SE examined changes in teacher knowledge of early literacy skills and in ratings of quality of early literacy skills instruction, student engagement during early literacy skills instruction, and teaching competencies in MS from winter 2014 to fall 2015 in the target schools participating in MDE’s early literacy initiative. Teachers in these schools participated in online and face-to-face PD on LTRS. REL SE designed a teacher knowledge survey that participating teachers took in online modules after the LTRS PD. REL SE trained statewide reading coaches to conduct classroom observations and rate teaching competencies. The REL SE report, “Educator outcomes associated with implementation of Mississippi’s K-3 early literacy professional development initiative,” showed that average teachers’ knowledge increased (48th %ile to 59th %ile), average ratings of quality of instruction increased (31st %ile to 58%ile), student engagement increased (37th%ile to 53%ile), and average rating of teaching competencies increased (30th %ile to 44th%ile). The increase in teachers’ knowledge and the increases in the average ratings of quality of instruction, student engagement, and teaching competencies in target schools were associated with progress in the PD program.

Findings: progress in the PD program was associated with improvements in teacher knowledge, quality of instruction, student engagement, and teacher competencies.

MDE & Barksdale Reading Institute have done a great job evaluating MS’s teacher preparation programs in reading and working with the Higher Ed Literacy Council to make improvements.
7 Elements Crucial to Intervention Success

- The importance of research-practitioner partnerships
- Determining the need for intervention
- Assessment selection and data use
- Evaluating curriculum & instructional materials for use in intervention
- Scheduling time for intervention
- Selecting, training, and supporting interventionists
- Locating space & maintaining open communications among interventionists, teachers, and parents

(Foorman, Dombek, & Smith, 2016)
The Self-study Guide for Implementing Early Literacy Interventions was developed to help district- and school-based practitioners conduct self-studies for planning and implementing early literacy interventions. It is intended to promote reflection about current strengths and challenges in planning for implementation of early literacy interventions, spark conversations among staff, and identify areas for improvement. This guide provides a template for data collection and guiding questions for discussion that may improve the implementation of early literacy interventions and decrease the number of students failing to meet grade-level literacy expectations by the time they enter grade 3.
Researcher-Practitioner Partnerships

- Partnerships must be mutually beneficial if they are to form, produce changes, be sustained, & scalable (Coburn, 2003).
- Too often researchers place demands on schools for instructional time & space to answer the researchers’ questions without creating buy-in for the project.
- Partnerships need to be at the district and the school levels.
- Participation in partnerships is associated with greater access to research, yet there’s mixed evidence about whether participation is associated with increased use of research for making decisions (Coburn & Penuel, 2016).
- A research agenda for these partnerships is needed!
Determining the Need for Intervention

Have the partnership jointly determine the need for intervention based on research evidence:
- At what grade/age?
- At what intensity/duration?

Policy considerations at district and school levels
-- Prioritizing intervention for students failing the state test can prevent early intervention
-- RtI/MTSS procedures
-- Strategy for referral to special education
-- Allocation of Title 1 and 3 funds
Screening accuracy can vary depending on trade-offs between the classification indices of sensitivity and specificity and positive/negative power. **Sensitivity** is the proportion of individuals who failed the outcome and were identified as at risk on the screen \( \frac{A}{A+C} \). **Specificity** is the proportion of individuals who pass the outcome test in the population who are not at risk on the screen (true negative; \( \frac{D}{D+B} \)). Both sensitivity and specificity are properties of the screen itself. Sensitivity considered important within RtI because it’s the percentage of students correctly identified by screen or needing further assessment/intervention. The overall correct classification index (OCC) is: \( \frac{(A+D)}{(A+B+C+D)} \).

In contrast, the sample-based indices of positive and negative predictive power depend on the proportion of students in the sample who are at risk—that is, the base rate of risk. **Positive predictive power** is the proportion of individuals identified as at risk on the screen who fail the outcome \( \frac{A}{A+B} \), whereas **negative predictive power** is the proportion of individuals identified as not at risk on the screen who pass the outcome test \( \frac{D}{C+D} \).

![Sample 2 x 2 Contingency Matrix for Considering Screening Accuracy](image)

(Petscher, Kim, & Foorman, 2011)
No Screen has 100% Classification Accuracy

- Partnership determines the goals for screening within available resources.
- If sufficient resources exist to intervene with all students predicted to fail outcome, then high sensitivity desired.
- If resources limited and “watchful waiting” adopted, then high negative predictive power better identifies students with low chance of developing a problem and needing intervention.

(Schatsneider, Petscher, & Williams, 2008)

#3: Because our focus is on not under-identifying students.
Just as the validity of the screen is tied to its ability to predict performance on a gold standard outcome, the validity of a diagnostic assessment should be tied to the ability of its diagnostic profiles to predict to a gold standard outcome test (Foorman, Petscher, & Stanley, 2016), rather than to unreliable descriptive notions of learning profiles (e.g., Tomlinson, 1999) or to invalid metrics for determining reading fluency (e.g., Francis et al., 2008). In fact, an efficient approach is to combine screening and diagnosis into one system, with a gating process so that the diagnostic component is given only to those students predicted to be at risk on the screen. Measuring growth also important to determining learning.

In addition to predictive validity, construct validity is very important to screening and diagnostic assessment. Educators are responsible for teaching standards that are often vaguely stated and necessarily narrowed to those measured in the state accountability test. State test designed to ascertain whether students meet grade-level proficiency. Thus, state test is a poor substitute for a diagnostic assessment because doesn’t measure skills at the low or high end of the score distribution in a grade. Computer-adaptive tests can address performance of students outside of grade-level norms, such as ELL and special ed students.
Evaluating Instructional Materials

- In NCLB (2001), instructional materials had to be based on scientifically-based reading research (SBRR).
- With ESSA (2015), instructional materials must be evidence-based.
- The What Works Clearinghouse (WWC) provides a useful resource for evidence-based programs.
- Evidence-based materials must still be implemented with fidelity, which requires training & support.
Rubric for Evaluating K-5 Instructional Materials
Both intervention approaches were taught daily from mid-October to the end of May for 45 minutes and consisted of a 25–30 minute reading component and a 15 minute oral language component.
55 schools were randomly assigned within geographic region to either the embedded or stand-alone intervention approach.
Summary

Well-implemented early literacy interventions help at-risk students improve: Gains could be due to regression to the mean (based on students’ very low initial status) or to normative growth expected based solely on classroom instruction – interpret gains cautiously.

Relative impacts of the two interventions: Stand-alone significantly higher (by 20 points) than embedded on G2 spelling (7 percentiles; effect size of 0.18).

Differences in outcomes between interventions by pretest and cohort:
Favored stand-alone in cohort 1 for:
- Poor spellers in G2 (11 percentiles; effect size of 0.27),
- G2 students on sentence comprehension with low vocab (15 percentiles; effect size of 0.38)
- K students on SESAT WR with high sentence comprehension (14 percentiles; effect size of 0.37)
Favored embedded in cohort 1 for:
- G1 students on FRA WR (11 percentiles; effect size of 0.29)

In sum, except for the G2 spelling impact, difference between stand-alone and embedded interventions were relatively small across all students.
Summary

Treatment effects on reading were different based on English learner status in kindergarten:

- Consistent with other studies, kindergarten EL scores were higher on PA compared to their non-EL peers in the embedded intervention (12 percentiles; effect size of 0.32)*
- Conversely, K non-EL students had higher SESAT Word Reading in the stand-alone intervention compared to their EL peers (12 percentiles; effect size of 0.31)
- Within the embedded intervention, kindergarten EL scores higher on SESAT Word Reading compared to non-EL students (11 percentiles; effect size of 0.27)

The reading components in both interventions emphasize phonemic awareness, letter sounds, and word reading. However, Strategic Intervention (embedded) also emphasizes comprehension. Perhaps the inclusion of an instructional focus on comprehension in Strategic Intervention facilitated mastery of alphabetic skills for English learner students, whereas the alphabetic skill instruction in Sound Partners (stand-alone) was sufficient to build word reading skills for non–English learner students.

*see Bialystok et al, 2003, for bilingual advantage on PA
To get better effects, increase intensity by reducing group size. Also, most effects were in K, so start earlier.
Conclusions

Although there were significant effects in grades K-2, well-implemented intervention daily for 45 minutes for 27 weeks did not ensure that students who started below the 10th percentile, on average, performed above the 25th percentile on reading outcomes.

Solution: Intervene with students in K or earlier; provide greater intensity by reducing group size (which would also help with programs requiring remediation to mastery).

In kindergarten, provide low-performing EL students with comprehension activities so as to build off their PA sensitivity in order to connect to the sound-spelling patterns necessary for learning to read.

Streamline the reading and language components of intervention to be the same on a daily basis, rather than alternating days for the language pieces.

Align Tiers 1 and 2. Improve Tier 1 instruction by making it more explicit and systematic so as to reduce numbers of students needing tier 2 (see Fien and colleagues’ work on Enhanced Core Reading Instruction (ECRI)).
Scheduling Time for Intervention

- Push-in or pull-out? Daily? For how long? [Gersten et al. (2008) recommend Tier 2 be 20-40 min 3-5 days per week in small groups of 3-4.]
- 1:1 or small group? [Vaughn et al. (2003) found groups of 3 just as effective as 1:1.]
- Before or after school or during the school day?
- If intervention is during the school day, then how can the bell schedule be re-arranged to accommodate all the students who need intervention?
- Longer duration generally more effective (Ross & Begeny, 2015).
Selecting, Training, & Supporting Interventionists

- How should intervention be funded? [cost effectiveness of prevention & early intervention]
- Who should provide intervention? [Certified teachers, paraprofessionals, volunteers?]
- When should intervention start and when should interventionists be trained?
- Who can support interventionists and monitor their fidelity?

Foorman & Al Otaiba (2009) report that effect sizes for community volunteers and college students delivering reading intervention were less than that of certified teachers. However, well-trained community volunteers are certainly an option, but are not a substitution for high quality classroom instruction (Elbaum, Vaughn, Hughes, & Moody, 2000).
• District employees are paraprofessionals or certified hourly teachers
• District employees and REL hired interventionists were provided the same initial training and ongoing support
• Student demographics: 1060 in K (38% EL); 1096 in G1 (34% EL); 1309 in G2 (33% EL). Total N = 3465. FRL ranged from 82-86%.

### Interventionists in ELI Study

<table>
<thead>
<tr>
<th></th>
<th>Stand-alone</th>
<th>Embedded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cohort 1</td>
<td>Cohort 2</td>
</tr>
<tr>
<td>N</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>% District Employees</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>% Female</td>
<td>90</td>
<td>97</td>
</tr>
<tr>
<td>% Bachelors Degree</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>% Masters Degree</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>% Certified Teacher</td>
<td>18</td>
<td>48</td>
</tr>
</tbody>
</table>

On average:

- 3-4 interventionists per school
- 4-6 small groups per school (55 schools total)
Timeline for preparing interventionists

- **Late September**
  - Interventionists attended a two-day training
  - Interventionists took materials home to review
  - Time was allotted at local office to review materials with leadership staff

- **Early October**
  - Interventionists visited assigned school to:
    - meet school leadership
    - meet the grade K–2 teachers
    - set up materials in their intervention space

- **Mid-October**
  - Daily intervention began
  - Leadership from local study sites visited each interventionist to answer questions and to provide additional training, if needed (ongoing throughout school year)

*Same timeline, training and preparation for Cohort 1 and Cohort 2.*
For each group, the fall and spring fidelity ratings were then averaged to create separate overall fidelity ratings for the reading and oral language components.

Instruction in each component of the stand-alone and embedded intervention groups was implemented with high fidelity.

<table>
<thead>
<tr>
<th>Component</th>
<th>Stand-alone Mean (SD)</th>
<th>Embedded Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>91 (13)</td>
<td>92 (11)</td>
</tr>
<tr>
<td>Oral Language</td>
<td>90 (13)</td>
<td>88 (24)</td>
</tr>
<tr>
<td>Grade 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>93 (11)</td>
<td>92 (11)</td>
</tr>
<tr>
<td>Oral Language</td>
<td>91 (14)</td>
<td>91 (22)</td>
</tr>
<tr>
<td>Grade 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>92 (15)</td>
<td>92 (11)</td>
</tr>
<tr>
<td>Oral Language</td>
<td>91 (12)</td>
<td>85 (26)</td>
</tr>
</tbody>
</table>

- Each group was observed in the fall and spring each year.
- Fidelity is the percent of the lesson in which instruction followed the lesson sequence and script within each of the skills taught.
Space

- Space for pullout intervention needs to be consistently available and close to the classroom to minimize transition time and maximize instructional time.
- Space should be conducive to engagement & learning.
Communications

- Ongoing communication among school leaders, teachers, & interventionists, and parents is essential (Chard, 2013; Foorman & Al Otaiba, 2009).
- School-based coordinator is essential (Gonzalez-DeHass et al., 2005).
- Teacher-interventionist communication regarding alignment of instructional goals & progress is crucial (Wasik, 1998).
Developing Instructional Leaders

- Instructional conferences for all administrators (e.g., viewing videotaped lessons)
- Learning walks (to observe lesson purpose and rigor and student engagement; debrief)
- The two-ten goal (administrators spend 2 hrs/day or 10 hrs/week on instructionally focused activities)
- Literacy coaches in elementary, middle, and high schools (meet weekly with principal to plan instruction & PD; confer regularly with teachers)
User-friendly tool (not evaluative); Identifies research-based practices
Enhances literacy instruction knowledge
Establishes consistent language & expectations
Promotes communication & collaboration
Provides data for decision making (professional learning needs, resources)
Components of the Walk-Through

**Common Across Grades K-3**
- One page summary:
  - Introduction
  - Overview of the Tool
  - Using the Tool
- Pre-Walkthrough Meeting Guide
- Post-Walkthrough Meeting Guide

**4 Grade Specific Checklists**
- Kindergarten
- 1st Grade
- 2nd Grade
- 3rd Grade

http://fcrr.fsu.edu/literacyroadmap/

Grade Specific: Covers
Foundational Skills
Reading Comprehension
Writing
Language
Speaking & Listening

Frequent walkthroughs
5-15 minutes per walkthrough
Focus on one or multiple literacy components
Check box when skill/concept observed (being taught by teacher or applied by students)
Record evidence in the form of notes
# First Grade Literacy Walkthrough: Foundational Reading Skills

<table>
<thead>
<tr>
<th>Objective Code</th>
<th>Evidence</th>
<th>Teacher Instruction</th>
<th>Student Learning</th>
<th>Instructional Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pre-assessment:**
- Identify students who need additional support.
- Plan strategies to address needs.

**Reading and Language Development:**
- Summarize and interpret informational or expository text.
- Identify the main ideas and supporting details.
- Use text evidence to support arguments and claims.

**Practices and Word Recognition:**
- Use visual cues to decode words.
-Apply phonics rules to decode words.
- Use context clues to determine word meanings.

**Strategy:**
- Monitor comprehension through questioning.
- Use graphic organizers to support understanding.

**Conclude Walkthrough:**
- Reflect on learning goals.
- Plan for next steps.

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Note: The above framework is a template for assessing literacy skills and should be adapted to fit specific classroom needs.
Commitment to Intervention

A key to successful implementation of intervention is for school leaders to agree to services with sufficient intensity and duration to accelerate students’ catch-up growth so as to meet grade-level proficiency benchmarks.
Essential Features of MTSS K-3 Reading

- Commitment to K-3 reading as a school’s top priority
- School-wide reading improvement plan
- School literacy leadership team
- Comprehensive literacy assessment system to inform decisions about reading instruction or intervention
- High quality classroom reading instruction for all students (tier 1)
- Evidence-based supplemental intensive reading intervention for students at risk for reading difficulties (tiers 2 and 3)
- Ongoing coaching and targeted PD to support administrator and teacher knowledge of reading research/practices/systems
- Parent engagement program

Coyne et al. (2016)

MTSS = Multi-tiered System of Support
Stumbling Block: Leadership

**Problem:** MTSS plan doesn’t guide day-to-day practice

**Solution**

1. Representative & empowered literacy team, with regular meetings/routines/communication

2. Useful/dynamic literacy plan with short- and long-term goals

3. Activity timeline that documents all school literacy activities with alignment to goals

*Coyne et al. (2016)*
Stumbling Block: Tier 1

**Problem:** Lack of consistent high-quality instruction

**Solution**

1. Comprehensive, published core reading program aligned with standards and program-specific PD

2. Teacher-developed templates outlining essential components of the core reading program to guide instruction, ensure consistency, and facilitate coaching

Coyne et al. (2016)
Stumbling Block: Data Use

**Problem:** Translating data to meaningful instruction

**Solution**

1. Data team meetings throughout the year to review data and document instructional decisions

2. Data workbooks/spreadsheets that compile all reading assessment data for a student, including instructional focus and materials, grouping and scheduling decisions, and assigned interventionist

*Coyne et al. (2016)*
Stumbling Block: Intervention

**Problem:** How to implement small-group intervention

**Solution**

1. Schoolwide block schedule that prioritizes reading instruction, small-group intervention, and (for those needing it) small-group supplemental intervention
2. Small number of evidence-based interventions aligned across tiers of instruction with program-specific PD
3. Small-group templates outlining essential components of each intervention program, including grouping & dosage decisions to guide intervention, ensure fidelity, and facilitate coaching

*Coyne et al. (2016)*

At least a 90-min reading block; 30 min small-group intervention in classroom; 30-min supplemental intervention for those pulled out (tier 2 or 3).
Data-Based Individualization

To implement DBI in reading, special educators need knowledge of:
- Explicit reading instruction
- How to select and implement evidence-based interventions
- How to identify students who need additional intervention
- How to use reading assessments to individualize instruction and evaluate response

Lemons, Al Otaiba, Conway, de la Cruz (2016)

Their article describes the knowledge & skills needed to be provided in preservice education for special education teachers to ensure they can design and implement data-based individualization (DBI). Examples of the kinds of clinical practica in various special ed programs and federally-funded training grants is provided. The International Dyslexia Association’s Knowledge & Practice Standards are praised.
Out of 422 students, 80 (19%) were in class 6, performing about 1 SD above the mean on all measures. Class 3, with 177 students (42%), also tended to perform above average on all measures except Vocabulary Pairs. Class 1, with 32 students (7%), performed 1 SD or more below the mean on all measures. Class 4, with 97 students (23%), and class 5, with 28 students (7%), were a mirror image of each other in that class 4 performed at the mean on the oral language measures but below average on the print-related measures of Phonological Awareness and Letter Sounds. Finally, class 2, with only eight students (2%), had an unusual profile of average performance on Vocabulary Pairs, Following Directions, and Letter Sounds but above average performance on Phonological Awareness and very low performance on Sentence Comprehension (which taps receptive syntax).
<table>
<thead>
<tr>
<th>Grade</th>
<th>Class</th>
<th>Description</th>
<th>% (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>1</td>
<td>Low on all variables</td>
<td>7% (32)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Average on VOC, FD, LS; above average on PA; very low on SC</td>
<td>2% (8)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Above average on all variables except VOC</td>
<td>42% (117)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Average on language variables; below average on PA and LS</td>
<td>23% (97)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Average on PA and LS; below average on language variables</td>
<td>7% (28)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>High on all variables</td>
<td>19% (80)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Very low on FD; below average on VOC and WR</td>
<td>1% (11)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>High on all variables</td>
<td>35% (246)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>High on FD; below average on VOC and WR</td>
<td>3% (29)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Low on all variables</td>
<td>17% (175)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Average on all variables</td>
<td>43% (428)</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Very low on all variables</td>
<td>5% (43)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Above average on WR and Spell; below average on VOC and FD</td>
<td>10% (92)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Low on all variables</td>
<td>15% (132)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Above average on VOC and FD; below average on WR and Spell</td>
<td>32% (286)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>High on all variables, especially Spell and WR</td>
<td>32% (282)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Above average on VOC and FD; very low on WR and Spell</td>
<td>5% (49)</td>
</tr>
</tbody>
</table>

Note. % (N) = percentage and number of students. The abbreviations for the K-3 FRA are: VOC = Vocabulary, PA = Phonological Awareness, LS = Letter Sounds, SC = Sentence Comprehension, WR = Word Reading; Spell = Spelling. All classes relate significantly to reading outcomes (g ranges from 1.10 to 1.48 in grades K-2.)
But even among the low-performing classes there was sometimes a notable weakness or strength. For example, in first grade it was the extremely low performance on Following Directions that helps explain why class 1 performed below the 25th percentile on reading comprehension when this class had similar performance to two other classes on Vocabulary Pairs and Word Reading. Intervention for the 11 students in Class 1 would need to take into account their very low skill in listening to and remembering concepts and directions by repeating directions and providing multiple practice opportunities to learn new concepts.
The vast majority of students (472, 78%) were in class 3, performing at the mean on all three FRA tasks. Students in classes 4 and 5 (representing 8% and 5% of students, respectively) performed above average, but class 4 was 1.5 SDs higher on the Word Recognition Task. Classes 1 and 2 (representing 5% and 4% of students, respectively) performed below average and were similar on Syntactic Knowledge but mirror images of each other on Vocabulary Knowledge (where class 2 was 1.5 SDs higher) and Word Recognition (where class 1 was 1.5 SDs higher).

The two classes that were above average on FRA measures, class 4 and class 5, both performed about 1 SD above the mean on reading comprehension and were not significantly different from each other but were significantly better than the other three classes. Class 3’s and class 2’s means were about 0.5 SD below average and were not significantly different from each other. Class 2 marginally outperformed class 1 (Hedges $g = -.53$). FRA classes account for 24% of variance in SAT-10 RC. [but goes up to 61% of...
variance in G9.]
## Latent profiles of reading and language variables for grade 3-5 and 8 students

<table>
<thead>
<tr>
<th>Grade</th>
<th>Class</th>
<th>Description</th>
<th>% (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>Low on all variables, very low on VKT</td>
<td>5% (28)</td>
</tr>
<tr>
<td>2</td>
<td>Low on all variables, very low on WRT</td>
<td>4% (25)</td>
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<tr>
<td>3</td>
<td>Average on all variables</td>
<td>78% (472)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>High on all variables, higher on WRT</td>
<td>8% (49)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>High on all variables, higher on VKT</td>
<td>5% (33)</td>
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</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Low on all variables</td>
<td>12% (70)</td>
</tr>
<tr>
<td>2</td>
<td>Average on all variables</td>
<td>53% (309)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Low on all variables; very low on VKT</td>
<td>1% (8)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>High on all variables; very high on VKT</td>
<td>9% (52)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Average on VKT; low on WRT and SKT</td>
<td>25% (143)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Low on WRT and SKT; very low on VKT</td>
<td>1% (8)</td>
</tr>
<tr>
<td>2</td>
<td>Very low on all variables</td>
<td>4% (36)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Low on all variables</td>
<td>53% (350)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Medium on all variables</td>
<td>35% (231)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Very high on all variables</td>
<td>7% (44)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Low on all variables</td>
<td>72% (451)</td>
</tr>
<tr>
<td>2</td>
<td>High on all variables</td>
<td>25% (158)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Very low on all variables, especially VKT</td>
<td>3% (20)</td>
<td></td>
</tr>
</tbody>
</table>

Note: % (N) = percentage and number of students. The abbreviations for the 3-10 FRA are: VKT = Vocabulary Knowledge Task; WRT = Word Recognition Task; SKT = Syntactic Knowledge Task. All classes relate significantly to SAT-10 Reading, $g$ ranges from 1.34 (in G4) to 2.19 (in G8).
Differentiating Instruction in 3-5 & 8 Based on Validated Profiles

Profile of low vocabulary is linked to low reading comprehension in grades 3 & 5
--Build word knowledge so that students understand the meanings of words they pronounce.

Profile of strong syntactic knowledge offsets low vocabulary in grade 4.
--Academic language strengths (vocabulary and syntactic knowledge) highly related to reading comprehension in grades 3-10 (Foorman et al., 2015b).
--Reading intervention in upper elementary through 10th grade need to build knowledge of the structure & meaning of words and the linguistic devices for making text cohesive.
References


References


Thank You!
Comments or Questions?

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FCRR
FLORIDA CENTER FOR READING RESEARCH
REL Southeast Literacy Roadmap

http://www.fcrr.org/literacyroadmap/