Assessment to Inform Instruction and Intervention within an RTI/SRBI Framework

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Michael Coyne
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University of Connecticut
Goal of today’s talk
- Understand the role assessment plays within SRBI/RTI
- Overview of the 4 main purposes of assessment within SRBI/RTI
- Effective assessment is a necessary partner to effective instruction

Background: Why RTI/SRBI?

Assessment within an RTI/SRBI framework
- Evaluation/outcome
- Screening/Benchmarking
- Diagnosis
- Progress Monitoring

Wrap Up and Questions
Why RTI/SRBI?
The Achievement Gap

The graph illustrates the achievement gap in reading skills across different grades. The green line represents successful readers, showing a steady increase in literacy skills from Grade 1 to Grade 3. The red line indicates struggling readers, showing variability in skill development over time.
The Achievement Gap

What research tells us about the achievement gap in reading:

- The achievement gap emerges early
- The achievement gap grows more discrepant over time
- The achievement gap is stubbornly resistant to change
- The achievement gap is evident across all areas of literacy
### NAEP Reading: Percent at/above Proficient (not SD, not ELL)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Grade 4</strong></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>CT</td>
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<td>30</td>
<td>33</td>
<td>34</td>
<td>34</td>
<td>36</td>
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<td><strong>Grade 8</strong></td>
<td></td>
<td></td>
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<tr>
<td>CT</td>
<td>43</td>
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</table>
## The Grade 4 Reading Achievement Gap

(all students)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Size of gap in scale score points*</th>
<th>States with smaller gap</th>
<th>States with the same gap</th>
<th>States with larger gap</th>
<th>States that cannot be compared</th>
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<tr>
<td>Lunch Status</td>
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<td>48</td>
<td>1</td>
<td>0</td>
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<tr>
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<td>24</td>
<td>20</td>
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# The Grade 8 Reading Achievement Gap

*(all students)*

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Size of gap in scale score points*</th>
<th>States with smaller gap</th>
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<tr>
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<td>19</td>
<td>30</td>
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<tr>
<td>White/Black</td>
<td>30.0</td>
<td>2</td>
<td>38</td>
<td>0</td>
<td>9</td>
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<td>White/Hispanic</td>
<td>33.3</td>
<td>26</td>
<td>14</td>
<td>0</td>
<td>9</td>
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</table>
Tier 1:
Comprehensive & Coordinated Instruction for All Students

~80% of Students

Tier 2:
Supplemental Intervention for Students Performing Below Grade Level (Some students)

~15%

Tier 3:
Specialized, Individualized Intervention for Students with Intensive Needs (Few students)

~5%
Comprehensive & coordinated \textit{classroom instruction} for all students

\textit{Scientifically-research based instruction and intervention}

\textit{Universal Common assessments:}
- Evaluating effectiveness of classroom instruction
- Identifying students who require additional intervention

- \textit{Early intervening}
  - Tiered system of instruction and intervention based on student need

- \textit{Progress monitoring} for students at risk for performing below grade level
How does Assessment fit into the RTI/SRBI framework?
CBER

Purposes for Assessment

**Evaluation/Outcome** - Assessments that provide a bottom-line evaluation of the effectiveness of a school’s instruction.

**Benchmarking/Screening** - Assessments that are administered to all students to determine the effectiveness of school-wide instruction/intervention as well as which children are at risk for difficulty and who will need additional intervention.

**Diagnosis** - Assessments that help teachers plan instruction by providing in-depth information about students’ skills and instructional needs.

**Progress Monitoring** - Assessments that determine if instruction or intervention is enabling students to make adequate progress.
Outcome assessments provide a bottom-line evaluation of the effectiveness of the overall instructional program.

- Administered to all children
- Must meet very high standards for reliability and validity.
- Often serve as an external accountability system and have high stakes implications for students and schools.
First Grade Reading Outcomes Before School Changes

- 28% At Grade Level
- 57% Need Additional Intervention
- 15% Need Substantial Intervention

ORF: Evaluation
First Grade Reading Outcomes After School Changes

Number of children

Oral Reading Fluency

- 57% At Grade Level
- 36% Need Additional Intervention
- 6% Need Substantial Intervention
## Evaluation/Outcome

### Grade 3 Reading for DRG F

<table>
<thead>
<tr>
<th>District</th>
<th>Year</th>
<th>Below Basic</th>
<th>Basic</th>
<th>Proficient</th>
<th>Goal</th>
<th>Advanced</th>
<th>% At/Above Goal (Descending)</th>
</tr>
</thead>
<tbody>
<tr>
<td>District A</td>
<td>2007</td>
<td>5%</td>
<td>5%</td>
<td>15%</td>
<td>50%</td>
<td>30%</td>
<td>80%</td>
</tr>
<tr>
<td>District B</td>
<td>2007</td>
<td>25%</td>
<td>20%</td>
<td>15%</td>
<td>30%</td>
<td>10%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Students Meeting Grade Level Reading Goals: Low risk (Goal & Advanced)

~40% of Students

~35%

~35%

~25%

Students Performing Significantly Below Grade Level Reading Goals: High Risk (Below Basic)
Purpose: Evaluation/Outcome

- **Key points**
  - Helps obtain bottom-line measure of efficacy
  - Helps determine if changes need to be made
  - More effective if complimented by internal accountability assessments
    - Empowering
  - Should not be surprised by CMT data
    - Too little too late
    - Early literacy predictive of later literacy achievement
Assessments used as benchmarks are administered multiple times per year to all students to determine the effectiveness of school-wide instruction/intervention.

- Time efficient (may or may not provide diagnostic information)
- Predictive power/utility is critical
- Organized and coordinated at school building level
Tier 1: Comprehensive & Coordinated Instruction for All Students

~80% of Students

Tier 2: Supplemental Intervention for Students Performing Below Grade Level

~15%

Tier 3: Specialized, Individualized Intervention for Students with Intensive Needs

~5%
Students Performing Below Grade Level Reading Goals: At Risk

Students Meeting Grade Level Reading Goals: Low risk

~28% of Students

~57%

~15%

Students Performing Significantly Below Grade Level Reading Goals: High Risk
Assessments used as screeners are administered multiple times per year to all students to determine quickly which children are at risk for reading difficulty and need additional intervention/support.

- Time efficient (may or may not provide diagnostic information)
- Predictive power/utility is critical
- Organized and coordinated at school building level
- Need fail safe gating procedures
Questions

- Which students are at risk for experiencing academic or behavioral difficulties now and in the future?
- Which students will need additional intervention to meet grade level expectations?

Instructional Implications

- Provide intensive and timely intervention to students who are identified as at risk for academic or behavioral difficulties.
Screening

Tier 2: Supplemental Intervention
Project VITAL: Vocabulary Intervention Targeting At-risk Learners

Funded by:
Institute of Education Sciences
U.S. Department of Education
PI’s: Michael Coyne, Ph.D. (UConn) and D. Betsy McCoach Ph.D. (UConn)

Research Summary

- Six studies
- Four school districts
- Five elementary schools
- Approximately 300 kindergarten students
Tier 1 Vocabulary Instruction

- Participants included 123 students from three elementary schools serving diverse groups of students from at-risk populations. **80 students were in the treatment group and 43 were in the no-treatment control group.**
- Students were taught the meanings of 54 vocabulary words over 36 half-hour instructional lessons (**two lessons per week over 18 weeks**).
- During instruction, students listened to a storybook read aloud. When target words were encountered, students were provided with a simple definition which was then used in the context of the story.
- After each reading of the storybook, teachers engaged students in activities that provided them with extended opportunities to interact with and discuss target words in varied contexts beyond those offered in the story.
"These bricks will make a fine sturdy house," said the third little pig.

Sturdy means strong. Now I’ll say the sentence again with the word that means sturdy. "These bricks will make a fine strong house." In the picture the little pig says that the bricks (point to the bricks) will make a sturdy, or strong, house. Everyone say sturdy.
Let's play a game about our magic word drenched.

I'll show you some pictures. If you think the picture shows something that looks drenched, or really wet, put your thumb up like this and whisper, "That looks drenched".

If the picture doesn't show something that looks drenched, don't say anything.
Effect Sizes

- Magnitude of the effect of an intervention

<table>
<thead>
<tr>
<th>Effect Size: $d$</th>
<th>Magnitude</th>
<th>Improvement Index</th>
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**Improvement Index:** the expected change in percentile rank for an average comparison group student if the student had received the intervention.
### Research Evidence

<table>
<thead>
<tr>
<th>Means (SDs)</th>
<th>Treatment</th>
<th>Control</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proximal Measure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Words</td>
<td>55.50 (37.58)</td>
<td>9.52 (5.51)</td>
<td>1.71</td>
</tr>
<tr>
<td><strong>Transfer Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPVT</td>
<td>98.99 (13.96)</td>
<td>91.46 (11.13)</td>
<td>0.60</td>
</tr>
<tr>
<td>Listening Comp.</td>
<td>3.32 (2.58)</td>
<td>2.42 (1.56)</td>
<td>0.42</td>
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Differential Effects

Target Word Measure vs. PPVT Fall Standardized

Control vs. Treatment
<table>
<thead>
<tr>
<th></th>
<th>Cohen's d (SS=85)</th>
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<th>Cohen's d (SS=115)</th>
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<tr>
<td>Target Words</td>
<td>1.06</td>
<td>1.75</td>
<td>2.44</td>
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<tr>
<td>PPVT</td>
<td>0.14</td>
<td>0.48</td>
<td>0.81</td>
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<tr>
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<td>0.08</td>
<td>0.41</td>
<td>0.74</td>
</tr>
</tbody>
</table>
Differential Effects

- **Graph**: Two lines represent the control and treatment groups. The control line is blue, and the treatment line is pink.

- **Axes**:
  - Y-axis: Listening Comprehension
  - X-axis: PPVT Fall Standardized

- **Data Points**:
  - Both lines start at a low PPVT score and rise as the score increases.
  - The treatment group shows a steeper increase compared to the control group.

- **Legend**:
  - Control
  - Treatment
## Differential Effects

<table>
<thead>
<tr>
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<td><strong>0.74</strong></td>
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Project IVI: Intensifying Vocabulary Intervention

Funded by:
Institute of Education Sciences
U.S. Department of Education
Michael Coyne, Ph.D. (UConn), Betsy McCoach, Ph.D. (Conn), Paige Pullen Ph.D. (UVA)

Purpose
- Draw on validated principles of instructional design and delivery to intensify vocabulary instruction/intervention to optimize its effectiveness with kindergarten students most at risk of learning disabilities.
Question

- Can Tier 2 vocabulary intervention increase the word learning of students at risk of language and learning difficulties?

Design

- All students received whole class Tier 1 vocabulary instruction
- Students with lower levels of vocabulary knowledge (PPVT < 92) received additional Tier 2 intervention on half the target vocabulary words
Screening

PPVT < 92

Tier 2:
Supplemental Vocabulary Intervention
Tier 2 Intervention

Picture Vocabulary

Not-at-Risk, Tier 1: 2.65
At-Risk, Tier 1: 1.75
### Picture Vocabulary

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not-at-Risk, Tier 1</td>
<td>2.65</td>
</tr>
<tr>
<td>At-Risk, Tier 1</td>
<td>1.75</td>
</tr>
<tr>
<td>At-Risk, Tier 1+2</td>
<td>2.45</td>
</tr>
</tbody>
</table>

**Tier 2 Intervention**
Students at risk for language and learning difficulties learned words that receive both Tier 1 & Tier 2 instruction to a greater extent than words that received only Tier 1 instruction.

The word learning of students at risk for language and learning difficulties who receive both Tier 1 & Tier 2 instruction approached the word learning of their peers who were not at risk who received only Tier 1 instruction.
Critical Questions

- What measure(s) will we use to determine which students receive supplemental intervention?
  - Is it predictive of important outcomes?
  - Is it efficient/feasible to administer?

- What gating procedures will we use to determine which students receive supplemental intervention?
  - Criterion "benchmark" scores?
  - National/Local norms? (what % level)
  - Resource capacity? (how many students can we serve)
Diagnostic assessments help teachers plan instruction by providing in-depth information about students’ skills and instructional needs.

- Most often administered to students who need intervention
- Must measure a variety of component skills or abilities, and must be directly useful in planning subsequent instruction
Questions

- On which of the important reading skill areas are the students on track, and on which do they need additional instructional intervention?
- Which specific reading skills has the student mastered or not mastered?
- What intervention options are most likely to be effective?
- Which students have similar instructional needs and will form an appropriate group for instruction?

Instructional Implications

- Develop and implement individual and coordinated instructional interventions that target the specific needs of students.
Examples of assessments that can be used for Diagnostic information

- Individually administered standardized measures
  - Woodcock Reading Diagnostic Assessment, CTOPP

- Individually administered reading inventories
  - Qualitative Reading Inventory (QRI), IRI,

- “Home grown” district/school developed inventories
  - phonemic awareness inventory, phonics skills checklist
Making Diagnostic assessment more efficient and useful

- Use diagnostic assessment strategically with selected students
- Consider trade-offs between the usefulness of the data and the loss of instructional time
- Consider alignment between the type of diagnostic data collected and availability of instruction and intervention options
Progress Monitoring –
Assessments that determine if instruction or intervention is enabling students to make adequate progress.
Questions

- Are individual children on track for meeting end of year reading goals?
- Is intervention enabling children to make sufficient progress?
- Is our instruction working?

Instructional Implications

- Adjust and intensify instruction and intervention so that children have the best chance of meeting reading goals.
- Do what it takes to keep children on track.
Stacy

- A first-grade student who moved to Center School in December.
- On the January benchmark ORF assessment, she read 4 correct words per minute (cwpm).
- According to benchmark goals for Winter of 1st grade, Stacy is at high risk for failing to meet the end of year goal. Gating procedures ushered Stacy into supplemental instruction at Tier 2.
- A diagnostic analysis of assessment protocols indicated that Stacy:
  - Had established phonemic awareness
  - Knew all her letter sound correspondences
  - Lacked a strategy for decoding words
  - Knew most sight words
Stacy’s Instructional Plan

- Take part in all classroom reading instruction (i.e., core instruction).
- Receive small group intervention (5-6 students) focusing on decoding, for 30 minutes, four time a week.
- Monitor progress weekly.
Progress Monitoring: CBM

Aimline

Adjust intervention
Project ERI: Early Reading Intervention

Funded by:
Institute of Education Sciences
U.S. Department of Education
Deb Simmons, Ph.D. (Texas A & M University) and Michael Coyne, Ph.D.

Purpose

- Test and replicate the curriculum efficacy of the Early Reading Intervention (ERI) in kindergarten
- Investigate the effects of intensifying ERI with students most at risk of reading disabilities
The Early Reading Intervention

- Small-group beginning reading intervention that focuses on key foundational reading and spelling skills.
  - **Phonemic skills:** first and last sound isolation, blending, and segmentation
  - **Alphabetic skills:** letter name/sound identification, word decoding, letter dictation, and whole word spelling
- 126 carefully sequenced and highly scripted 30-minute lessons
- Previous research supports the efficacy of ERI on early pre-reading and reading outcomes
  (Simmons et al., in press; Simmons et al., 2007)
Participants

- 9 schools in TX, CT, & FL
- 17 interventionists
  - Interventionists were school identified and included paraprofessionals, reading teachers, special education teachers, and other specialists
- 101 kindergarten students
  - 67 treatment students
  - 34 comparison students
Research Question: Year 03

- Does adjusting instructional support based on response to intervention lead to increased learning outcomes for kindergarten students receiving a small group beginning reading intervention?
Participants

- Students were screened on measures of alphabet knowledge and phonological awareness to identify those students who were most at risk for experiencing reading difficulties at the beginning of kindergarten (e.g., performing below the 30%)
- Students who qualified were randomly assigned to the treatment (ERI modified) or comparison conditions (ERI standard)
- Interventionists were also assigned to treatment or comparison conditions (some interventionists taught groups in both conditions)
ERI Standard Condition

- ERI was implemented as designed
  - Small groups (3-5)
  - 30-minutes per day, 5-days per week
  - Started at Lesson 1 and progressed sequentially through the program (1 lesson per day)
  - Students took program specific mastery assessments over the year
ERI Modified Condition

- Implementation of ERI was adjusted based on students’ response to the intervention
- Ongoing response data
  - Interventionists collected informal data on student response weekly and students took 8 program-specific mastery assessments over the course of the year

Two modifications:

- Regrouping
  - Students were regrouped based on data from program mastery assessments
  - Regrouping opportunities occurred approximately every 4 weeks

- Program Pacing
  - Groups repeated or skipped specified lessons based on data from program mastery assessments
Effect Sizes

- Magnitude of the effect of an intervention

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**Improvement Index:** the expected change in percentile rank for an average comparison group student if the student had received the intervention.
# Measures

## Phonemic Awareness Skills
- DIBELS: Phonemic Segmentation Fluency
- CTOPP: Blending Words

## Alphabetic Skills
- WRMT: Letter-Sound Checklist
- DIBELS: Nonsense Word Fluency
- WRMT: Word Attack
- WRMT: Word ID
- Test of Written Spelling
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<td>DIBELS: Nonsense Word Fluency</td>
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<td>WRMT: Word Attack</td>
<td>.44</td>
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<td>.62</td>
</tr>
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<td>Test of Written Spelling</td>
<td>.36</td>
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Summary & Implications

- In this study, adjusting instructional support based on response to intervention lead to reliable learning gains across multiple measures assessing phonemic, alphabetic, reading, and spelling skills.
- Adjustments in intervention were fairly modest in scope and relatively feasible for school personnel to carry out.
Progress Monitoring Questions

- CBM or CBA?
- How do we make decisions about when and how to adjust and intensify Tier 2 intervention.
- Do we have mechanisms in place to adjust and intensify Tier 2 intervention?

**Alterable Components of Intervention**
- Content, Pacing, Programs/Materials, Interventionist/Interventionist Expertise, Grouping, Dosage, Scheduling
Wrap Up
Within SRBI/RTI, research-based instruction is only one half of the equation. The other half is assessment. It is the compass that tells you:

- Where you currently stand in relation to standards and benchmarks
- Who will benefit from research-based instruction
- When to provide research-based instruction; For how long
- Whether instruction is working—at tiers 1-3, or at the school-, district-, or state-level
“Weighing cows won’t make ‘em fatter.”

Assessment data must:

- Answer important questions
- Enable informed instructional decision making
- Be used in the way that it is intended for
Embedding a valid, reliable, and responsive assessment system that covers multiple purposes enables:

- A proactive vs. reactive approach to accountability
  - A preventative vs. “wait-to-fail” approach to learning difficulties and educational achievement
- Targeted, efficient, and effective allocation of instructional/educational resources
Research

Conduct school-based research on developing and evaluating evidence based practices in literacy, behavior supports, and assessment

Translating Research to Practice

Support schools, districts, and states in adopting, implementing, and sustaining evidence based practices
Thank you

Questions?

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