Early Identification of Children at Risk for Reading Disabilities

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Literacy Research Symposium
Christchurch, NZ
October 2009
Early Identification

- Early intervention can significantly reduce risk for reading disabilities
  - Cavanaugh, Kim, Wanzek, & Vaughn, 2004
  - O’Conner, Fulmer, Harty, & Bell, 2005
  - Scanlon, Vellutino, Small, Fanuele, & Sweeny, 2005
  - Vellutino, Scanlon, Small, & Fanuele, 2006
  - Simmons, Coyne, Kwok et al., in press
  - Torgesen, Wagner, Rashotte et al., 2001
  - Vaughn, Linan-Thompson, & Hickman, 2003
IQ-Achievement Discrepancy

- Identification (and intervention) is most often delayed until the child’s achievement is sufficiently low to meet the discrepancy requirement
- “wait and see”
IQ-Achievement Discrepancy

- Identification (and intervention) is most often delayed until the child’s achievement is sufficiently low to meet the discrepancy requirement.
- “wait and see” fail
- Often not until 3rd or 4th grade
Individuals with Disabilities Education Act (IDEA) ‘04

“A local educational agency shall not be required to take into consideration whether a child has a severe discrepancy between achievement and intelligence…”

“may use a process which determines if a child responds to a scientific, research based intervention as part of the evaluation procedures”
Response to Intervention (RTI)

- Comprehensive approach for early identification and prevention of RD

- Based on the premise that a child who does not respond to increasing levels of systematic (and intensive) instruction is likely to have a learning/reading disabilities
Response to Intervention

TIER 1
- General education
- Universal Screening
- All students

TIER 2
- Targeted interventions
  - Small Group
  - Progress Monitoring

TIER 3
Tier 1:
School-/Classroom-Wide Systems for All Students, Staff, & Settings

~80% of Students

Tier 2:
Specialized Group Systems for Students with At-Risk Behavior

~15%

Tier 3:
Specialized Individualized Systems for Students with Intensive Needs

~5%
Early identification of reading disabilities within a RTI framework

- Following two cohorts of children from kindergarten through Grade 3
Screening Accuracy

- Particular attention is given to the accuracy of screening instruments
- Errors in identification can be costly
  - over identification
  - under identification
How to have an accurate screen?

- Choose the right measures
  - phonological processing
  - print knowledge
  - emerging language abilities

- Combine the measures
  At best, single measures are only moderately correlated ($r<.50$) with reading outcome
Combining Measures


“probability of reading success”
How to have an accurate screen?

- Choose the right measures
  - phonological processing
  - print knowledge
  - emerging language abilities

- Combine the measures
  At best, single measures are only moderately correlated (r<.50) with reading outcome

- Use dynamic assessment
Dynamic Assessment

- Measurement of learner’s potential over the short term
- Assessor actively intervenes during the course of the assessment with the goal of intentionally inducing changes in the learner's current level of performance.
- “Mini-assessment” of response to intervention
Floor Effects Associated With Universal Screening and Their Impact on the Early Identification of Reading Disabilities

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Christopher Schatschneider
Florida State University
Florida Center for Reading Research
Mindy Sittner Bridges
University of Kansas
Katherin Mendoza
Florida Center for Reading Research

Response to intervention (RTI) holds great promise for the early identification and prevention of reading disabilities. The success of RTI rests in part on the accuracy of universal screening tools used within this framework. Despite advancements, screening instruments designed to identify children at risk for reading disabilities continue to have limited predictive validity. In this study, the authors examined a common screening instrument for the presence of floor effects and investigated the impact that these effects have on the predictive validity of the instrument. Longitudinal data (kindergarten to third grade) from a large cohort of children were used. These data included children’s performance on five measures from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and two reading achievement outcome measures. The results showed that DIBELS measures were characterized by floor effects in their initial administrations and that these effects reduced the predictive validity of the measures. The implications of these findings for early identification are discussed.
Floor Effect
Normal Distribution
Initial Sound Fluency

Which picture begins with /m/?

What sound does pillow begin with?
Florida Progress Monitoring Database

- About 17,000 children
- ISF given in Sept, Dec, Feb of Kindergarten
Catts, Petscher, Schatschneider, Bridges, & Mendoza (2009)
Ceiling Rule: Discontinue after 4 consecutive items in which the answer must be provided by the examinee, continuing the count to the next page.

**PADS**

**Instructions:** Open the Picture Stimuli Book to the first demonstration item. Say to the student, “We’re going to play a game with words. Listen to the word *cowboy*. If I say *cowboy*, point to the cow and then the boy while saying each syllable, “without cow” (cover the cow). If I say *boy*, point to the boy.” Then to the next page in the Picture Stimuli Book and say, “Listen to the word *toothbrush*. Say *toothbrush* (point to the tooth and then the brush while saying each syllable) “without tooth” (cover the tooth).”

If the child answers correctly, go to Item 1.

If the child does not answer correctly or does not respond in 10 seconds, say, “Toothbrush” (point to the tooth and then the brush while saying each syllable) “without tooth” (cover the tooth) “is brush” (point to the brush). Proceed to item 1.

<table>
<thead>
<tr>
<th>Item</th>
<th>Stimulus Directions</th>
<th>Correct Response</th>
<th>without prompts</th>
<th>with prompts 1</th>
<th>with prompts 2</th>
<th>with prompts 3</th>
<th>answer permitted</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>doghouse</td>
<td>house</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>2</td>
<td>football</td>
<td>ball</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
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<td>3</td>
<td>pancakes</td>
<td>cake</td>
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<td>4</td>
<td>rainbow</td>
<td>bow</td>
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<td>0</td>
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<td>0</td>
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<td>5</td>
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<td>pair</td>
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<td>0</td>
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<td>9</td>
<td>milk</td>
<td>lip</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>10</td>
<td>dolphins</td>
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<td>0</td>
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<td>11</td>
<td>penny</td>
<td>pin</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Instructions:
Open the Picture Stimuli Book to the first Demonstration Item. Say to the student, “We’re going to practice saying some words. You are going to look at a picture and see a word. You are going to say that word. Let’s try one.”

### Examiner Directions
1. **doghouse**: Say doghouse without dog. 
2. **plesiosaur**: Say plesiosaur without ple. 
3. **dolphin**: Say dolphin without dol. 
4. **dolphin**: Say dolphin without dol. 
5. **gigantopithecus**: Say gigantopithecus without gig. 
6. **snail**: Say snail without sn. 
7. **shark**: Say shark without sha. 
8. **squirrel**: Say squirrel without su. 
9. **mice**: Say mice without mic. 
10. **mice**: Say mice without mic. 
11. **peyote**: Say peyote without pey.

### Correct Response
- **house**
- **tooth**
- **bar**
- **tail**
- **whale**
- **snail**
- **shark**
- **mice**
- **peyote**

### Table

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<th>With Prompts 3</th>
<th>Answer Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. doghouse</td>
<td>Say doghouse without dog.</td>
<td>house</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>○</td>
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<tr>
<td>2. plesiosaur</td>
<td>Say plesiosaur without ple.</td>
<td>tooth</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>3. dolphin</td>
<td>Say dolphin without dol.</td>
<td>bar</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>4. dolphin</td>
<td>Say dolphin without dol.</td>
<td>tail</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>5. gigantopithecus</td>
<td>Say gigantopithecus without gig.</td>
<td>whale</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>6. snail</td>
<td>Say snail without sn.</td>
<td>mice</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. shark</td>
<td>Say shark without sha.</td>
<td>mice</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. squirrel</td>
<td>Say squirrel without su.</td>
<td>mice</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>9. mice</td>
<td>Say mice without mic.</td>
<td>mice</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>10. peyote</td>
<td>Say peyote without pey.</td>
<td>peyote</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Prompts for Items 1 through 5 – Syllable Deletion

Prompt 1, items 1-5:
Repeat the demonstration item sentence and then repeat the stimulus item. “When I say cowboy and take away cow, I say boy. Now you say [doghouse] and take away [dog].”

Prompt 2:
Pause after saying the first syllable of the word and then emphasize the second syllable. “Try again. Say _____ (pause briefly) _____ (emphasize this syllable) without _____.”

Prompt 3: (using the Picture Stimuli Book)
Point to the picture on the left while you say the first syllable of the word, pause, and then point to the picture on the right while you say the second syllable. As you say the first syllable again, cover the picture on the left with your hand. “Try again. Say _____ (pause briefly) _____ (emphasize this syllable) without _____.”

Answer Provided:
Provide the answer, pointing to the pictures as described above. “______ without _____ is _____.”

Prompts for Items 6 through 11 – Syllable Deletion

Prompt 1, items 6-11:
Repeat the stimulus item. “Try again. Say _____ and take away _____.”

Prompt 2:
Pause after saying the first syllable of the word and then emphasize the second syllable. “Try again. Say _____ (pause briefly) _____ (emphasize this syllable) without _____.”

Prompt 3: (using the Picture Stimuli Book)
Point to the picture on the left while you say the first syllable of the word, pause, and then point to the picture on the right while you say the second syllable. As you say the first syllable again, cover the picture on the left with your hand. “Try again. Say _____ (pause briefly) _____ (emphasize this syllable) without _____.”

Answer Provided:
Provide the answer, pointing to the pictures as described above. “______ without _____ is _____.”
Bridges (2009)

- 162 kindergarten children (5-6 years of age)
- Over-sampled for at-risk children; 70% at risk on earlier DIBELS ISF
- Administered ISF and PADS in Sept K
Bridges (2009)
Bridges (2009)
Predicting Reading Outcome

- Measured end-of-year reading achievement
- When used in combination with the ISF, PADS was a significant unique predictor of reading outcome
- As a supplementary measure, PADS significantly reduced (by 33%) the false positives resulting from the ISF
Reading Comprehension

- Emerging language abilities (e.g., vocabulary, grammar) are related to subsequent reading comprehension abilities
- Screening instruments for RD seldom measure these abilities
- Language screens are available
Language

- Not likely to have floor effects because children have had 5-6 years to spread themselves out
Peabody Picture Vocabulary Test-3
Predicting Reading Outcomes

- Need to look toward long-term outcomes
- Initial evidence suggests that PPVT-3 adds little to the short-term prediction (K-1<sup>st</sup> grade) of reading outcome over and above a measure of non-word reading (Johnson, Jenkins, Petscher, & Catts, in press)
- However, PPVT-3 adds considerably to the long-term prediction (K to 3<sup>rd</sup> grade) of reading outcome (Johnson, personal communication)
Tier 2

- What are the implications of poor performance on a language screen?
- Will Tier 2 instruction lead to differential gains in language (vocabulary)? That is, can it add to the identification of later comprehension problems over and above initial screening status?
- Measures like PPVT-3 are unlikely to be responsive
Tier 2 Vocabulary Instruction

- Taught 42 words to at-risk kindergarten children across 26 weeks
- Each word taught in the context of a storybook (3 per book) and out of context with picture cards
- Measured pre- and post-test knowledge of words
6. What does 'clever' mean? [smart; do good in school]
   - Full (Go to next item)
   - Partial
     → Say, try to tell me something more about 'clever'.
   - I don't know/wild answer
     → Say, try to tell me something more about 'clever'. It's okay to guess.
     - Full (Go to next item)
     - Partial
       → If partial or IDK, say:
          Does 'clever' mean...
          a. mean
          b. pretty
          c. smart

7. What does 'sprout' mean? [to begin to grow]
   - Full (Go to next item)
   - Partial (grow)
     → Say, try to tell me something more about 'sprout'.
   - I don't know/wild answer
     → Say, try to tell me something about 'sprout'. It's okay to guess.
     - Full (Go to next item)
     - Partial (grow)
       → If partial or IDK, say:
          To 'sprout' means...
          a. to jump
          b. to grow
          c. to yell

8. What does 'milk' mean? [you drink it]

9. What does 'burglar' mean? [a person that steals from your house, robber]
   - Full (Go to next item)
   - Partial (steal, rob)
     → Say, try to tell me something more about 'burglar'.
   - I don't know/wild answer
     → Say, try to tell me something about 'burglar'. It's okay to guess.
     - Full (Go to next item)
     - Partial (steal, rob)
       → If partial or IDK, say:
          A burglar is a person who...
          a. steals
          b. walks
          c. cooks
9. What does ‘burglar’ mean? [a person that steals from your house, robber]

- Full (Go to next item)
- Partial (steal; rob)
- I don’t know / wild answer

Follow-up prompt:
- Say Try to tell me something more about ‘burglar’.
- Say Try to tell me something about ‘burglar’. It’s okay to guess.

If partial or IDK, say:
- A burglar is a person who . . .
  - a. steals
  - b. walks
  - c. cooks
# Vocabulary Probe

<table>
<thead>
<tr>
<th></th>
<th>Pre test</th>
<th>Post test</th>
<th>Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>25.1</td>
<td>62.6</td>
<td>37.5</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>9.3</td>
<td>20.0</td>
<td>15.4</td>
</tr>
</tbody>
</table>

Max points = 142    mean chance score = 14
Vocabulary Probe
Gain Scores

Mean = 37.52
Std. Dev. = 15.369
N = 65
Vocabulary Instruction

- Gain score is only mildly related to pre-test score (R=.27, p<.05)
- Gain score is only moderately related to PPVT-3 score (R=.53, p<.05)
Instruction in story structure might also be amenable to short-term gains in comprehension and production of narrative texts.
Thank You