Beyond RTI for Decoding:
Supporting Early Vocabulary Development within a Multi-tier Approach to Instruction & Intervention

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RTI:
- RTI, or multi-tier approaches to instruction and intervention, holds great promise for increasing the effectiveness and efficiency of our instructional supports for all students.
- RTI approaches are not domain specific.
- However, to date, the vast majority of RTI research and demonstration projects in early literacy have focused on efforts to increase students’ code-based skills (e.g., phonemic awareness, alphabetic knowledge, decoding).

What we know from research:
- Children enter school with meaningful differences in vocabulary knowledge as a result of differences in experiences and exposure to literacy and language activities. (Hart & Risley, 1995)
- The vocabulary gap grows larger in the early grades. Children who enter with limited vocabulary knowledge grow much more discrepant over time from their peers who have rich vocabulary knowledge. (Biemiller & Slonim, 2001)

Noteworthy Responses:
- Stalk - “he stomped his feet and said march”
- Sway - “hula-ing on the beach”
- Baffled – “when you have to go to the bathroom”
- Pursue - “I don’t know, you tell me”
- Narrow – “throwing up”
- Haven - “God’s world”
- Amble - “being all ambly”
- Romp - “if you get on the top bed and you get bumpy”

A Conceptual Framework for Reading/Literacy Instruction
Specific Comprehension Difficulties
Typical Readers
Mixed Reading Difficulties
Word Reading Difficulties

Implications
- Many students begin school at risk for language and comprehension difficulties. Instruction and intervention focused on code-based skills will not be sufficient to meet these students’ needs.
- Instruction and intervention in meaning-based skills (e.g., language, vocabulary, listening comprehension) should start at the beginning of schooling.
- This instruction should often be separate from code-based instruction, especially in the early grades. (i.e., within oral language activities)

Project VITAL:
Vocabulary Intervention Targeting At-risk Learners
Funded by:
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U.S. Department of Education

Research Summary
- Six studies
- Four school districts
- Five elementary schools
- Approximately 300 kindergarten students

Question:
- What are the effects of providing classroom vocabulary instruction to kindergarten students within the context of storybook reading activities?

Extended Instruction
- Simple explanation of target words provided within the context of the story. Extended activities after story reading.
- Extended vocabulary instruction is characterized by explicit, conspicuous teaching that includes using both contextual and definitional information, giving multiple exposures of target words in varied contexts, and encouraging deep processing.

"These bricks will make a fine sturdy house," said the third little pig.

Sturdy means strong. Now I'll say the sentence again with words that mean 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.

(Show picture) Do these children look drenched? If you held up your thumb like this, you're right! The children in this picture look drenched, or really wet.

"The children laughed as they got drenched playing in the water fountain."

Picture 1 (Man in the rain)

The man in this picture is drenched, or really wet. This picture reminds me of a time when I was outside at a picnic. The skies got very dark and it started to rain. I ran to get inside the nearest building but it was too late. I got drenched from the rain. I felt cold and wet until I changed my clothes.

( Remove picture) Tell me about a time when you were drenched from the rain.

Extended Instruction

Let's play a word game. I'll tell you about some things. If you think it is strong, say "That's sturdy!" If you think it is not very strong, say "Uh oh, that's not very sturdy!"

Examples:

- A big jet airplane in the sky.
- A little paper airplane on a windy day.
- A tall tower made of cards.
- This school.
- A big huge rock.
- A snowman on a hot sunny day.

Do you think a cauldron is sturdy? Why?

Would you be approaching a cauldron that was full of snakes? Why?

If a storm was approaching, would you go into a sturdy house? Why?

Would you put a cauldron on a chair that wasn't sturdy? Why?

What would you do if a dog was approaching your cauldron full of food? Why?
Participants

- 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.
- In two schools, intact classes were assigned to either treatment (n = 3) or control (n = 2) and classroom teachers delivered the intervention to the whole class.
- In the third school, students from three classrooms were randomly assigned to treatment (n = 23) or control (n = 21) and the intervention was delivered by two graduate students in small groups of 3-5 students outside of the classroom.

Intervention

- 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.

Transfer Measures

- Peabody Picture Vocabulary Test: PPVT-III: Norm referenced measure of generalized receptive vocabulary.
- Listening Comprehension: Factual & inferential questions about a story that contained target words (18 target/395 total words). Adapted from the SNAP.

Means (SDs)

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Control</th>
<th>d</th>
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</thead>
<tbody>
<tr>
<td>Proximal Measure</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Target Words</td>
<td>55.50 (37.58)</td>
<td>9.52 (5.51)</td>
<td>1.71</td>
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<tr>
<td>Transfer Measures</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>
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<tr>
<td>Listening Comp.</td>
<td>3.32 (2.58)</td>
<td>2.42 (1.56)</td>
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</table>


Effect size

- Magnitude of the effect of an intervention

<table>
<thead>
<tr>
<th>Effect Size</th>
<th>Magnitude</th>
<th>Improvement Index</th>
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<tbody>
<tr>
<td>0.25</td>
<td>small</td>
<td>10 percentile</td>
</tr>
<tr>
<td>0.5</td>
<td>medium</td>
<td>20 percentile</td>
</tr>
<tr>
<td>0.8</td>
<td>large</td>
<td>30 percentile</td>
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</table>

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

Implications

- Findings suggest that extended vocabulary instruction implemented with kindergarten students can result in statistically and educationally significant differences on both proximal measures of target word knowledge and transfer measures of generalized language and literacy.
Vocabulary Instruction

Question

- Is vocabulary instruction equally effective for all students?

<table>
<thead>
<tr>
<th></th>
<th>Cohen's d (SS=85)</th>
<th>Cohen's d (SS=100)</th>
<th>Cohen's d (SS=115)</th>
</tr>
</thead>
<tbody>
<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>
<td>Listening Comp.</td>
<td>0.08</td>
<td>0.41</td>
<td>0.74</td>
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</tbody>
</table>
Implications

- Response to the vocabulary instruction was moderated by overall receptive vocabulary knowledge assessed at pretest.
- In other words, students with higher initial vocabularies tend to benefit more from classroom vocabulary instruction than those students with lower initial vocabularies.
- Tier 1 vocabulary instruction by itself, therefore, seems insufficient to close the vocabulary gap among students, and, in fact, may help to widen it.

Project IVI: Intensifying Vocabulary Intervention

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 supplemental, or Tier 2 vocabulary intervention increase the word learning of students at risk of language and learning difficulties?

Methodology

- All students received whole class (Tier 1) vocabulary instruction (n=43)
- Four 30-minute whole-class sessions
- Students with lower levels of vocabulary knowledge (PPVT < 92) received additional Tier 2 intervention on half the target vocabulary words (n=20)
- Four 30-minute small-group sessions
Research Evidence

- 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 was approached the word learning of their peers who were not at risk who received only Tier 1 instruction.

Research Question

- What are the added benefits of providing supplemental vocabulary intervention to kindergarten students with lower initial levels of vocabulary knowledge in a small-group Tier 2 setting?
- Can we “scale up” tiered vocabulary supports

Research Design

- Classroom teachers implemented the *Elements of Reading* vocabulary program during whole class instruction for 20-30 minutes per day, 5 days per week, over the course of the school year (approximately 20-24 weeks).
  - 19 kindergarten classrooms (160 Tier 1 kids)
- School-based interventionists provided researcher-designed supplemental vocabulary intervention to small-groups of students identified as at-risk for language and literacy difficulties (PPVT < 95), 20-30 minutes per day, 4 days per week.
  - 17 intervention groups (80 Tier 1+2 kids)
Vocabulary Instruction

Tier II Intervention

- Small group instruction supplementing Tier I: “dosage”
- Words taught in Tier I were reintroduced and reinforced
- Students had extended opportunities to interact with words with immediate corrective feedback
  - Examples and non examples
  - Multiple supportive contexts
  - Different activities
  - Extended review
- Extended language usage and sentence comprehension was reinforced
- Scaffolded instruction supported foundational language skills

Assessment Plan

- Screening
  - Receptive Vocabulary: Peabody Picture Vocabulary Test (PPVT-4)
- Pretest
  - Expressive Vocabulary: Expressive Vocabulary Test (EVT)
  - Listening Comprehension: Woodcock Johnson Test of Achievement
  - Target Word Knowledge: Researcher developed Receptive/Expressive Measure
- Posttest
  - Screening/Pretest Measures
  - Language Listening Comprehension: Story Retell, Comprehension Questions, & Language Sample

Effect of Tier 2: Target Words (expressive)

- Treatment Effect = 9.55 points
- Effect Size: $d = 1.2$
- Tier 1 students’ mean: 14.69
- Tier 2 students’ mean: 13.94
  (this difference is not statistically significant)

Effect of Tier 2: Target Words (receptive)

- Treatment Effect = 2.78 points
- Effect Size: $d = .88$
- Tier 1 students’ mean: 13.97
- Tier 2 students’ mean: 12.58
  (this difference is not statistically significant)
Effect of Tier 2: Overall Vocabulary

- Treatment Effect = 2.78 points
- Effect Size: $d = .2$
- Improvement index = 6 percentile points

**Challenges**

- **Instructional Challenges**
  - What should Tier 2 look like?
    - “double dose”, more words, less words, different words, foundational language skills
  - How do you intensify intervention for students who don’t respond (Tier 3)?

- **Assessment Challenges**
  - Screening
  - Progress monitoring, evaluation

- **Coordination Challenges**
  - How do we coordinate tiered supports for vocabulary with other supports?