Recent Research in Comprehension
Presented by Anneta Buenger and Clint Neighbors

Central Regional Reading First
Technical Assistance Center

Adapted from: Research Related to Strengthening Instruction in Reading Comprehension: Joseph K. Torgesen
Overview of the session

1. The relations between reading fluency and reading comprehension

2. Vocabulary instruction and its connection to reading comprehension

3. Direct instruction in comprehension strategies as a means of improving reading comprehension
The most important Reading First goals:

1. Increase the percentage of students reading “at grade level” each year at each grade level from kindergarten through third grade

2. Decrease the percentage of students with serious reading difficulties each year at each grade level
The most important measures of “grade level” proficiency in reading are those that assess a student’s ability to comprehend the meaning of text.
Helping students acquire the skills, knowledge, and attitudes required for proficiency in comprehension of text is the most important goal of reading instruction, PERIOD.
What we know about the factors that affect reading comprehension

Proficient comprehension of text is influenced by:

- Accurate and fluent word reading skills
- Oral language skills (vocabulary, linguistic comprehension)
- Extent of conceptual and factual knowledge
- Knowledge and skill in use of cognitive strategies to improve comprehension or repair it when it breaks down.
- Reasoning and inferential skills
- Motivation to understand and interest in task and materials
What should comprehension instruction be the instruction of?  - Mike Pressley

1. Teach decoding skills
2. Encourage the development of sight words
3. Teach students to use semantic context cues to evaluate whether decodings are accurate
4. Teach vocabulary meanings
5. Encourage extensive reading
6. Teach self-regulated use of comprehension strategies

Text structure, vocabulary, print style and font, discourse, genre, motivating features

Word recognition, vocabulary, background knowledge, strategy use, inference-making abilities, motivation

Environment, purpose, social relations, cultural norms, motivating features (e.g. school/classroom climate, families, peers)
The role of vocabulary becomes increasingly important as students progress in school.

First Grade
Vocabulary = 20%
ORF = 61%

Second Grade
Vocabulary = 31%
ORF = 61%

Third Grade
Vocabulary = 36%
ORF = 50%

Seventh Grade
Vocabulary = 51%
ORF = 43%

Tenth Grade
Vocabulary = 52%
ORF = 32%
The most widely accepted definition of fluency

“Fluency is the ability to read text quickly, accurately, and with proper expression”
National Reading Panel

Fluency is the ability to read text quickly, accurately, and with good comprehension
Prosody is at least partially an index of comprehension...
However, because it is difficult to measure both prosody and comprehension with a brief test on a large scale,

and because reading rate is strongly correlated with comprehension....

Most states have set their end-of-year targets, or benchmarks for reading fluency in terms of oral reading rate - the number of words per minute that can be read correctly on a grade level passage.
Why is reading rate so strongly related to reading comprehension?
Scatterplot of FCAT Reading and Fluency: Third Grade

N=218
R=.76
Current research in reading development provides support for two ways in which individual differences in reading fluency are causally related to differences among students in reading comprehension.

Efficient, or automatic, identification of words allows the reader to focus more attention on the meaning of the passage.

Comprehension processes themselves may cause individual differences in reading rate. These comprehension processes influence both fluency and comprehension tasks.

The Surprise Party

My dad had his fortieth birthday last month, so my mom planned a big surprise party for him. She said I could assist with the party but that I had to keep the party a secret. She said I couldn’t tell my dad because that would spoil the surprise.

I helped mom organize the guest list and write the invitations. I was responsible for making sure everyone was included. I also addressed all the envelopes and put stamps and return addresses on them.....
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How much fluency (rate) is enough to facilitate good reading comprehension?
Scatterplot of FCAT Reading and Fluency: Third Grade

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How much fluency (rate) is enough to facilitate good reading comprehension?

**DIBELS Benchmarks**

1\textsuperscript{st} Grade – 40 correct words per minute  
2\textsuperscript{nd} Grade – 90 correct words per minute  
3\textsuperscript{rd} Grade – 110 correct words per minute

How were these benchmarks established?

They were set empirically at a level that insured a high probability (approx. 80%) of success on measures of reading comprehension.
## Relationship of performance levels on ORF to other student characteristics
### 3rd Grade

<table>
<thead>
<tr>
<th>A3 ORF</th>
<th>Mean PPVT</th>
<th>% Minority</th>
<th>% FRL</th>
<th>% ELL</th>
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<tr>
<td>0-9</td>
<td>69.9</td>
<td>83%</td>
<td>88%</td>
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<td>150-159</td>
<td>117.8</td>
<td>48%</td>
<td>46%</td>
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</table>

**ORF level correlation with:**
- Vocabulary = .99
- %FR lunch = -.97
- %Minority = -.97
- % ELL = -.96
Percent of students performing at grade level and above on the FCAT at various levels of performance on Oral Reading Fluency-Assessment 3 (Feb) in Florida.

- 0-9: 15%
- 10-19: 57%
- 20-29: 86%
If target for oral reading fluency was set at the 40\textsuperscript{th} percentile and above, what would the end-of-year “benchmarks” be?

<table>
<thead>
<tr>
<th></th>
<th>DIBELS norms</th>
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<td>79wpm</td>
<td>85wpm</td>
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<tr>
<td>3\textsuperscript{rd}</td>
<td>110wpm</td>
<td>96wpm</td>
<td>102wpm</td>
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</tbody>
</table>
Percent of Students at “grade level” in Reading Comprehension, Oral Reading Fluency, and Oral Vocabulary in grades 1-3

Rcomp = SAT10
ORF = Dibels
Voc = PPVT
Percent of Students at “grade level” in RC, ORF, and Vocab in grades 1-3 using Hasbrook and Tindal ORF norms and 40th percentile as goal
What are the **big ideas** that should guide our work to build reading fluency in young children?

Reading First students need powerful instruction in strategies for accurate word identification (phonemic decoding) in first grade and extending into complex skills in second grade.

Children must become **accurate** readers as a first step toward becoming **fluent** readers.

Reading first students need many opportunities to acquire sight word representations for high frequency, high utility words – working to expand student’s “sight word vocabulary” as fast as possible.

Supervised, repeated reading practice is one efficient way to do this – direct “sight word” practice for very low readers.
What are the big ideas that should guide our work to build reading fluency in young children?

Reading First students should be encouraged to attend to meaning in all their reading assignments.

Encouraging students to read with prosody will lead them to attend to meaning.

Encouraging students to check the accuracy of their decoding attempts with unfamiliar words by asking if their initial guess “makes sense” in the context of the sentence will lead them to attend to meaning.

Repeated practice in reading for meaning supports the growth of “automatic comprehension processes” which are important for both fluency and comprehension.
Let's now turn to Vocabulary...
The topics to be discussed

1. What is the nature of the relationship between vocabulary and reading comprehension?
2. How many words do children need to know? The instructional challenge for Reading First schools
3. What do we know from research about the best ways to teach vocabulary?
4. An important, unresolved issue about effective approaches to vocabulary instruction in Reading First schools
Some Definitions and distinctions....

Vocabulary – knowledge of words and word meanings

Complications:
- Oral vs. written
- Receptive vs. expressive
- Breadth, Depth, Fluency

Confusions:
- Sight word vocabulary as in words students can recognize by sight
- Vocabulary as in words that students know the meaning of.
What is a “sight word”? 

“Sight words are words that readers have read accurately on earlier occasions. They read the words by remembering how they read them previously. The term sight indicates that sight of the word activates that word in memory, including information about its spelling, pronunciation, typical role in sentences, and meaning” (Ehri, 1998)

“Sight of the word activates its pronunciation and meaning in memory immediately without any sounding out or blending required. Sight words are read as whole units with no pauses between sounds” (Ehri, 2002)
Levels of Word Knowledge
(Stahl, 2003)

• I never saw it before
• I’ve heard of it but I don’t know what it means
• I recognize it in context—it has something to do with…
• I know it.
A comment on the relationship….

“Of the many compelling reasons for providing students with instruction to build vocabulary, none is more important than the contribution of vocabulary knowledge to reading comprehension. Indeed, one of the most enduring findings in reading research is the extent to which students’ vocabulary knowledge relates to their reading comprehension.”

From the report of the National Reading Panel....

“...reading comprehension is a cognitive process that integrates complex skills and cannot be understood without examining the critical role of vocabulary learning and instruction and its development...”
How does vocabulary contribute to the acquisition of reading comprehension?

The obvious way – knowing the meanings of the words in text is necessary to understand the message being conveyed.

Other probable, less obvious ways --

- Vocabulary contributes to the development of phonemic awareness (Metsala, 1998)
- Vocabulary contributes more accurate decoding of words whose printed form is unfamiliar (Ehri, 2002)
- Vocabulary contributes to reading fluency because it leads to more accurate reading practice
The impact of vocabulary instruction on reading comprehension

1. Stahl & Fairbanks (1985) report an effect size of .97 for comprehension of passages specifically containing words that were taught.

2. They also report an effect size of .30 for effects on standardized measures of reading comprehension.

Effects of vocabulary instruction on reading comprehension in the primary grades will likely be relatively modest.
The challenge of vocabulary instruction for Reading First schools

1. Biemiller (2005) found that average students knew about 6,000 root words by end of 2nd grade.

2. Students in lowest quartile knew about 4,000 words.

3. Students in lowest quartile enter kindergarten knowing between 2000 and 2500 words, so must learn 3500 to 4000 words to “close the gap.”

4. Currently, lowest quartile students learn about 500-600 words a year.

5. Must add another 500 words a year to even approach “closing the gap.”
The challenge of vocabulary instruction for Reading First schools

“To have a useful impact on vocabulary growth, an intervention would need to add several hundred root word meanings per year. This is considerably more meanings than are presently addressed in classroom programs.”

“Until schools are prepared to emphasize vocabulary acquisition, especially in the primary grades, less advantaged children will continue to be handicapped even if they master reading written words”.

What do we know from research about the best ways to teach vocabulary?

**Primary conclusions from report of NRP (2000)**

1. Vocabulary should be taught both directly and indirectly.
2. Repetition and multiple exposures to vocabulary items are important.
3. Learning in rich contexts is valuable for vocabulary learning.
4. Vocabulary learning should entail active engagement in learning tasks.
5. Dependence on a single vocabulary instructional method will not result in optimal learning.
Major conclusions:

1. Methods don’t always have the same impact on reading comprehension as they do on performance on a vocabulary measure.

2. Methods that provide a balance of definitional information and experience with words in multiple contexts provide a consistently strong impact on both vocabulary and comprehension performance.

3. Depth of processing did not impact performance on vocabulary tests, but did effect generalization to reading comprehension.
Conclusions from Stahl and Fairbanks meta-analysis across grades

Major conclusions (cont):

4. Amount of time devoted to instruction of each word had much less of an impact on performance on vocabulary tests than on reading comprehension, where it was significant.

5. Methods that provide only definitional information about words do not produce a reliable impact on comprehension—nor do methods that provide only one or two exposures to words in context.
Current research indicates that the kind of vocabulary instruction that is most likely to have an impact on reading comprehension involves:

Providing both definitional information about words and experience accessing their meaning in multiple contexts.

Total amount of time spent learning words has an impact on reading comprehension – more exposures rather than fewer.

It is also helpful to require students to actively work with words, use in sentences, redefine, classify, etc.
The currently unresolved issue:

For very young children (K-2) with limited vocabulary (bottom quartile), is it better to teach many word meanings briefly, or a few words more intensively?

Remember, young poor children enter schools with vocabularies substantially smaller than their middle-class peers.

Students with smaller vocabularies have more difficulties learning word meanings from context than students with larger vocabularies.

Poor students have a very large word knowledge gap to overcome if they are to be prepared for reading comprehension in 3rd grade and later.
Background for an extended research example:

If young children are introduced to many word meanings briefly in K-2, can they use this initial knowledge to further build word knowledge through reading?

The concept of “fast mapping” (Cary, 1978)

Direct, brief explanation of meaning can establish initial “fast mapping” of meaning

As initially mapped words are encountered in other contexts, their meaning is extended and deepened.
Practical implications....

If 41% of taught words are learned, to acquire 400 new word meanings, 1000 would need to be taught. This is 25 per week.

Biemiller & Boote recommend teaching many words briefly in K-2 for three reasons:

- Different children know different meanings
- Initial explicit learning may allow students to extend word knowledge as they encounter taught words in other contexts – profit from context
- Other methods, involving more intensive instruction, do not begin to address the size of the gap
Questions for further research...

What words should be taught in grades K-3?
Can high rates of word learning be sustained over time?

Does brief teaching of large numbers of word meanings in primary grades produce increased reading comprehension in grades 3 and 4?

What are the best methods of vocabulary instruction for students of different ages and abilities?

What are the best ways to measure vocabulary growth?
An overview of major topics to be covered

1. The relations between reading fluency and reading comprehension
2. Vocabulary instruction and its connection to reading comprehension
3. Direct instruction in comprehension strategies as a means of improving reading comprehension
Definitions of Reading Comprehension

“intentional thinking during which meaning is constructed through interactions between text and reader.” Durkin (1993)

“the construction of the meaning of a written text through a reciprocal interchange of ideas between the reader and the message in a particular text.” Harris & Hodges, 1995

meaning arises from the active, deliberate thinking processes readers engage in as they read.
Definitions of Reading Comprehension

Said concisely:
“reading comprehension is thinking guided by print”
Perfetti 1995

Said not so concisely but more completely:
“the process of simultaneously extracting and constructing meaning through interaction and involvement with written language. It consists of three elements: the reader, the text, and the activity or purpose for reading” Rand Reading Study Group, 2002
Summary: a research-based view of reading comprehension

Reading comprehension involves active mental effort to construct meaning.

Good readers use prior knowledge, information in text, and thinking/reasoning processes to construct new knowledge and understanding.
Evidence for instruction in comprehension strategies comes from three sources:

1. Proficient readers monitor their comprehension more actively and effectively than less proficient readers.

2. Proficient readers are more likely to use a variety of active cognitive strategies to enhance their comprehension and repair it when it breaks down.

3. Explicit instruction along with supported, scaffolded practice in the use of comprehension strategies produces improvements in reading comprehension in both younger and older students.
What Good Readers Do When They Read:

“What they found was that good readers achieve comprehension because they are able to use certain procedures — labeled comprehension strategies by the researchers—to relate ideas in a text to what they already know; to keep track of how well they are understanding what they read; and, when understanding breaks down, to identify what is causing the problem and how to overcome it.” (Lehr & Osborne, 2006)
From the Report of the National Reading Panel:

“The idea behind explicit instruction of text comprehension is that comprehension can be improved by teaching students to use specific cognitive strategies or to reason strategically when they encounter barriers to comprehension when reading.” (NRP, 2000, p. 4-39).

“Reading instruction is effective in stimulating student comprehension abilities to the extent that it stimulates students to process texts as good readers do.” (Pressley, 2000, p. 545)
What are reading comprehension strategies?

Comprehension strategies are specific procedures children can use to help them:

1) become aware of how well they are comprehending text as they read
2) improve their understanding and learning from text

• Generating questions
• Using background knowledge to make predictions
• Constructing visual representations
• Summarizing
What do we know from research about the impact of directly teaching reading comprehension strategies? The review of the National Reading Panel (2000)

1. Identified 16 categories of strategy instruction, with 7 having “firm scientific basis” for concluding they improve comprehension in normal readers

<table>
<thead>
<tr>
<th>Comprehension monitoring</th>
<th>Generally much stronger evidence for specific learning on experimenter tests and from text read in the experiment – less evidence for generalization to standardized measures of reading comprehension</th>
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<tbody>
<tr>
<td>Cooperative learning*</td>
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<tr>
<td>Graphic organizers</td>
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<tr>
<td>Story structure</td>
<td></td>
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<tr>
<td>Summarization</td>
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</table>
An important cautionary note from a leading comprehension researcher

The most powerful demonstrations of the impact of comprehension strategies instruction have come from studies that have deeply taught a small repertoire of comprehension strategies over time.

We should not assume that effective comprehension strategy instruction involves teaching all the strategies on some list (The NRP’s or other).

What do we know from research about the impact of directly teaching reading comprehension strategies? The review of the National Reading Panel (2000)

“The major problem facing the teaching of reading comprehension strategies is that of implementation in the classroom by teachers in a natural reading context with readers of various levels”... NRP, 2000, 4-47
Other comments on the challenge of providing effective professional development for teachers in this area. (Pressley, 2006)

“It is time to do some serious research on how to develop teachers who can provide comprehension strategies instruction that does produce students who learn to use and do use the strategies in a self-regulated fashion”

“I suspect that successful professional development is going to require at least a school year. Such professional development will require developing modeling, explanation, and scaffolding skills in teachers, as well as a commitment to teach and encourage comprehension strategies use every day.”
How can we curricularize high quality instruction in the self-regulated use of comprehension strategies?

The concept of “balanced” comprehension instruction. Both explicit instruction and modeling, and lots of time for actual reading, writing, and discussion of text. (Duke & Pearson, 2002)

Critical Elements

1. An explicit description of the strategy and when and how it should be used.
2. Teacher and/or student modeling of the strategy in action
3. Collaborative use of the strategy in action to construct meaning of text.
4. Guided practice using the strategy with gradual release of responsibility – scaffolding by the teacher
5. Independent use of the strategy
How can we curricularize high quality instruction in the self-regulated use of comprehension strategies?

The larger classroom context (desirable elements)

1. Lots of time spent actually reading
2. Experience reading real text for real reasons – have a purpose for the reading
3. Experience reading the range of genres that we wish students to comprehend
4. An environment rich in vocabulary and concept development through reading, experience, and, above all, discussion of words and their meanings
5. Lots of time spent writing texts for others to comprehend
6. An environment rich in high-quality talk about text

(From Duke & Pearson, 2002)
How can we curricularize high quality instruction in the self-regulated use of comprehension strategies?

**Other teaching considerations**

1. Using well-suited texts
2. Concern with student motivation
3. Ongoing assessment
   - Can the child ask a meaningful question about a passage just read?
   - Does the child’s story recall include information organized by story grammar?
   - Can the child summarize a paragraph briefly?
A second extended research example: *Concept Oriented Reading Instruction* with 3\textsuperscript{rd} grade students

**The Goal:** Create a method of improving literacy skills that is highly engaging and effective in establishing use of comprehension strategies to increase reading comprehension

**Premise:** “motivated students usually want to understand text content fully and therefore, process information deeply. As they read frequently with these cognitive purposes, motivated students gain in reading comprehension proficiency” (Guthrie et al., 2004, p. 403)
Four principles for creating engaged readers

- When **content goals** are prominent in reading, students focus on gaining meaning, building knowledge, and understanding deeply, rather than on skills and rewards...**meaningful conceptual content in reading instruction increases motivation for reading and text comprehension**

- Affording students **choices** of texts, responses, or partners during instruction. Choice leads to ownership and higher motivation
Four principles for creating engaged readers (cont.)

- Have an abundance of interesting texts available at the right reading level for every student. Students more readily read text they can read fluently.

- Allow students the opportunity to work collaboratively with ample opportunities for discussion, questioning, and sharing
“The usefulness of brief instruction in comprehension strategies” Willingham, 2006

Teaching reading comprehension strategies to students is one way that we teach them that the main purpose of reading is to understand the author’s message.

In order to generate useful questions, make summaries, check the accuracy of predictions, create story maps, students must actively think about the meaning of text.

Students can learn comprehension strategies relatively quickly, but it is extended practice over time in reading for meaning that actually improves general comprehension. Comprehension strategies help to remind students that the goal of reading is making sense of text.
Other promising strategies and practices

1. Increasing the amount of time spent in discussion focused on constructing the meaning of text
The role of discussion in promoting comprehension

During discussions, students can be directly led to engage in thoughtful analysis of text in ways that support their comprehension when they are reading on their own (Beck & McKeown, 2006).

Increasing the amount of high quality discussion of reading content is also frequently cited as a way of increasing engagement in reading and reading based assignments (Guthrie & Humenick, 2004).
Characteristics of effective discussions

approaches that emphasized critical analysis of text or that involved discussion (either teacher led or student led) of specific questions about text meaning had the most consistently positive effect on reading comprehension outcomes (Murphy & Edwards, 2005)

Leading students in discussion while they are reading text may be more effective than discussing text after students have read it on their own (Sandora, Beck, & McKeown, 1999)
Other promising strategies and practices

1. Increasing the amount of time spent in discussion focused on constructing the meaning of text

2. Increasing the use of expository text in reading assignments for students in grades 1-3.

   Based on hypothesis that, “experience with one type of text will help children become good readers or writer of that type of text but not of some other type of text.” (Palincsar & Duke, 2004)

   Children currently receive very little exposure to informational text in early primary grades—particularly in low SES schools

   There is some beginning evidence that inclusion of more informational text does not hurt early reading acquisition, and can promote growth of content knowledge and teacher attention to vocabulary and comprehension
The Big Ideas: Fluency

Fluency (reading rate) is causally related to reading comprehension.

Reading rate is also correlated with comprehension because of its correlation with other things (vocabulary, SES, ELL status) that influence performance on comprehension tests.

Students successful on reading comprehension tests actually can have widely varying reading rates.

Helping students become more fluent readers will definitely improve their comprehension—but to get maximum effects, we need to do other things that have an impact on variables like vocabulary, use of active comprehension strategies, etc.
The Big Ideas: Vocabulary

Individual differences in vocabulary are definitely related to differences in performance on tests of reading comprehension.

The most effective methods of teaching vocabulary so that it influences reading comprehension involve a balance of definitional information and repeated exposure to words in multiple contexts.

Vocabulary instruction, by itself can be expected to have a modest impact on comprehension.

To address the large differences in vocabulary size associated with differences in SES, we also have to employ methods that provide at least brief instruction in the meaning of many words.

We must find ways to devote more time to vocabulary instruction if we are to “close the SES related achievement gap.”
The Big Ideas: Reading Comprehension Strategies

1. Teaching comprehension strategies to students is a way of helping them learn to think more deeply about the meaning of text.

2. We should focus on teaching a small repertoire of strategies, and then provide many opportunities for students to use the strategies while reading interesting text that they want to understand.

3. Providing opportunities for students to have high quality discussions about the meaning of text is an important part of instruction in reading comprehension.

4. Increasing opportunities for students to read interesting expository text may be very helpful in preparing them for the demands of understanding more complex text in third grade and after.
References:


Murphy, P.K., & Edwards, M. N. (2005, April). What the studies tell us: A meta-analysis of discussion approaches. In M. Nystrand (Chair), *Making sense of group discussions designed to promote high-level comprehension of texts.* Symposium presented at the annual meeting of the American Educational Research Association, Montreal, Canada.


References suitable for use in teacher study groups

**Phonics Instruction**


**Fluency instruction**


References suitable for use in teacher study groups

Vocabulary Instruction


References suitable for use in teacher study groups


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