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Reading Difficulties: Prevention, Early Intervention, and Remediation

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www.ReidLyon.com



The Profession Through the Ages

“The history of the profession has never been a particularly attractive subject in professional education, and one reason for this is that it is so deplorable a story.

For century after century all the way into the remote millennia of its origins, the profession got along by sheer guesswork and the crudest sort of empiricism. It is hard to conceive of a less scientific enterprise among human endeavors.”

Lewis Thomas (1983)



The Profession Through the Ages

“Virtually anything that could be thought up for treatment was tried out at one time or another, and once tried, lasted decades or even centuries before giving it up.

It was, in retrospect, the most frivolous and irresponsible kind of human experimentation, based on nothing but trial and error, and usually resulting in precisely that sequence.”

READING PROFICIENCY FOR ALL:
HAVE WE MET THIS GOAL?

NOT YET!



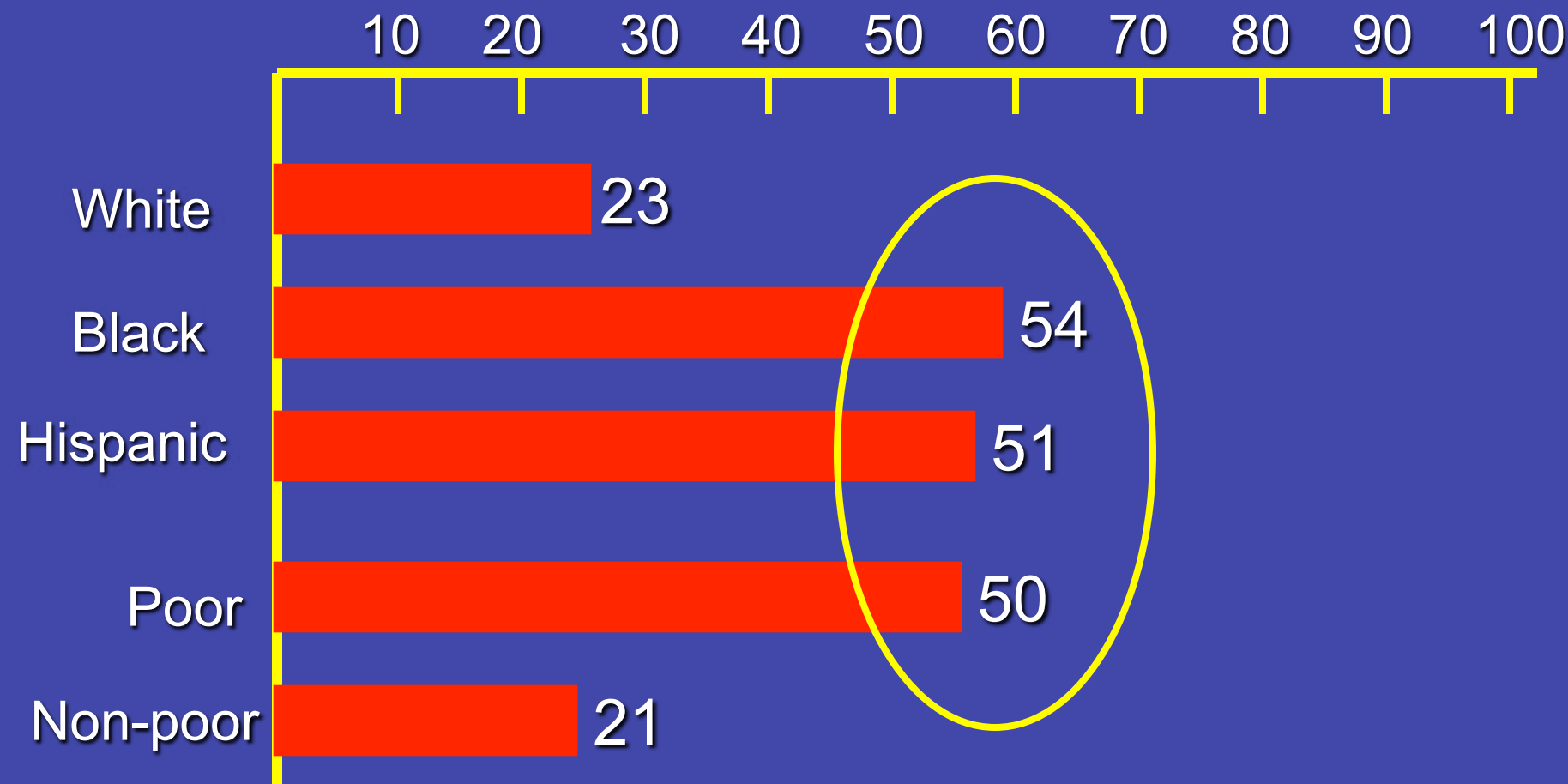
Why have we not met the reading goal?

- The sheer magnitude of the reading crisis in America
- The sheer complexity of reading development
- and difficulties
- The complexity of an effective implementation

THE SHEER MAGNITUDE OF THE READING CRISIS IN AMERICA

2007 results from National Assessment of Educational Progress at 4th Grade

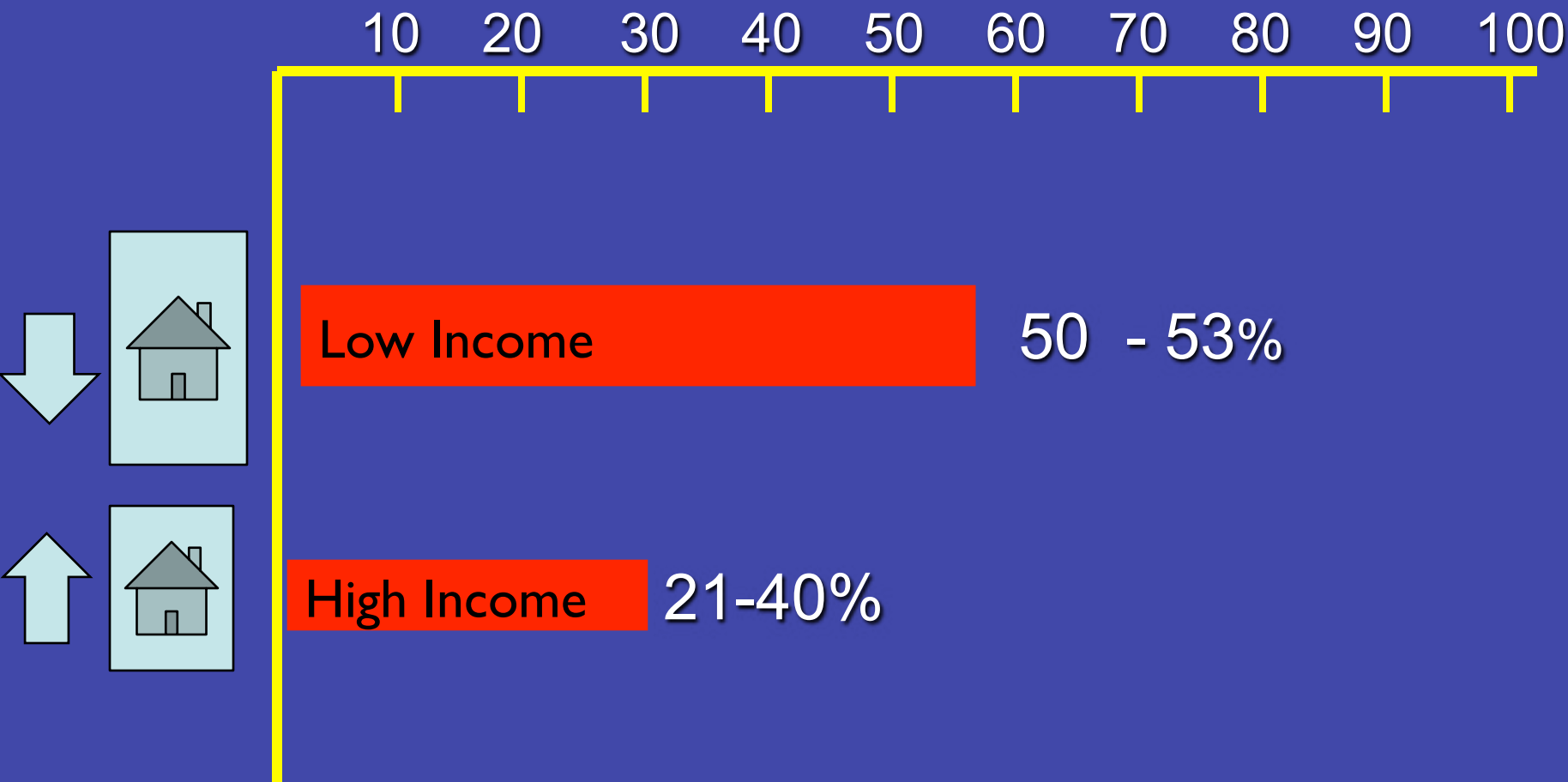
Percent of 4th grade readers below Basic





2007 results from National Assessment of Educational Progress at 4th Grade

Percent of 4th graders reading below Basic





Most Poor Children:

1. Are delayed in the development of phonemic awareness
2. Have had less exposure to print and the alphabet
3. Have vocabulary that are usually less well developed –
 $\frac{1}{2}$ in poor children compared to other children
4. Have a range of experience and conceptual knowledge
that is often limited or different compared to other
students
5. Frequently do not have good models of reading or
support for academics in their homes



PISA **2003**: US 15 Year-Olds Rank Near The End Of The Pack Among 29 OECD Countries

	U.S. RANK
READING	20 TH
MATH	24 TH
SCIENCE	19 TH

THE SHEER COMPLEXITY OF READING DEVELOPMENT AND READING DIFFICULTIES?

THE 3 FUNDAMENTAL RESEARCH QUESTIONS

Posed By: The National Institute of Child Health and Human Development/NIH (Lyon, 1983 – 2005)

1. How do we learn to read
2. Why do some kids (and adults) have difficulty
3. What can we do to eradicate that difficulty

NIH-NICHD Multidisciplinary Research Program

(North America; Lyon, 1985-2005)

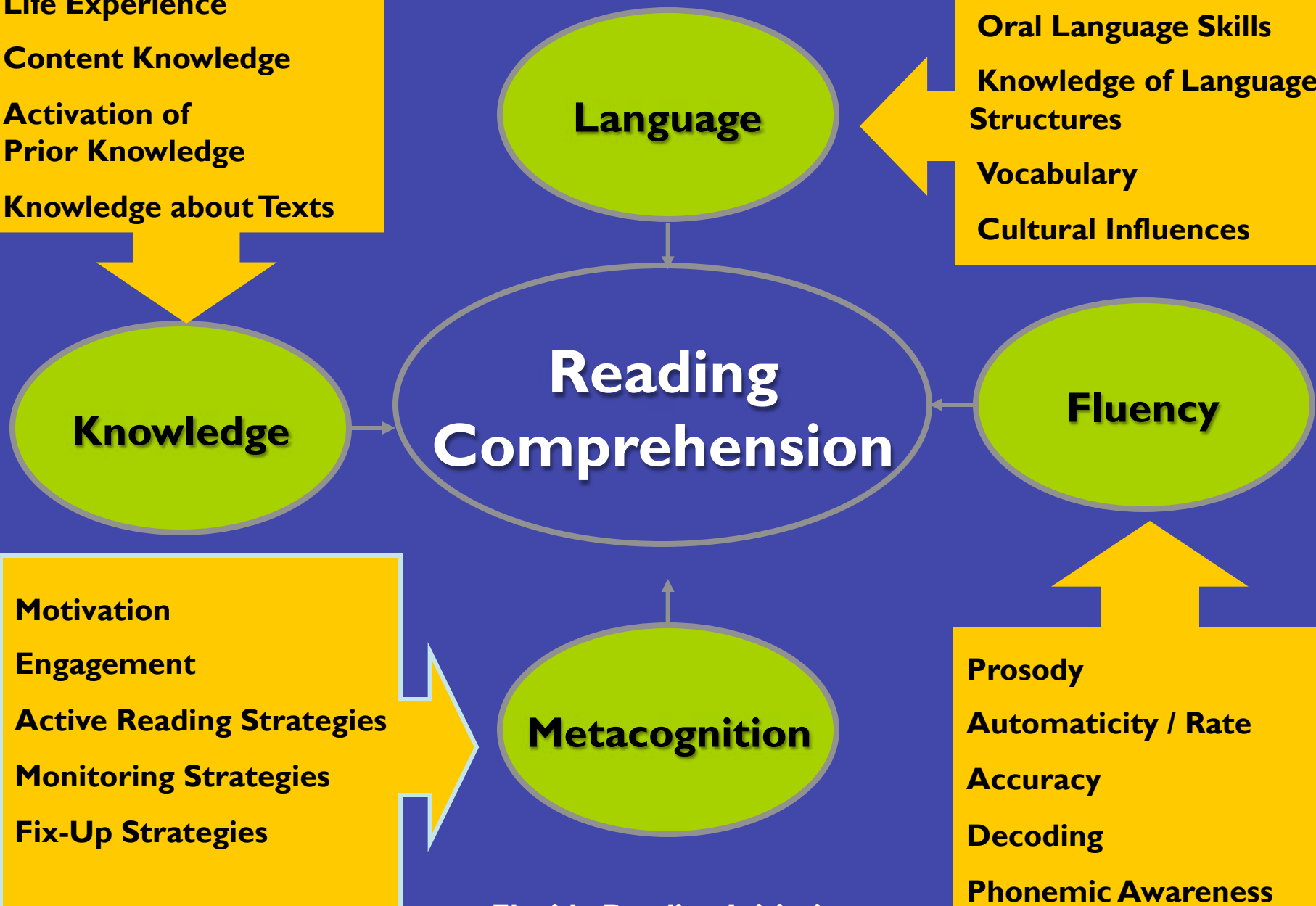


What Do Kids Need To Know To Read?

A HECK OF A LOT

Life Experience
Content Knowledge
**Activation of
Prior Knowledge**
Knowledge about Texts

Oral Language Skills
**Knowledge of Language
Structures**
Vocabulary
Cultural Influences





3 potential stumbling blocks to becoming a good reader (NRC Report, 1998)

1. Difficulty learning to read **words** accurately and fluently
2. Insufficient **vocabulary**, general knowledge, and reasoning skills to support **comprehension** of written language
3. Absence or loss of initial **motivation** to read

WHAT DOES THE RESEARCH TELL US?

Effective Reading Instruction

“Reading instruction effectiveness lies not with a single program or method but, rather, with a teacher who thoughtfully and analytically integrates various program, materials, and methods as the situation demands.”

(Duffy & Hoffman)



READING INSTRUCTION MUST BE INTEGRATED FROM KG- G12

- If a critical component is missing, students who are at risk will not develop the essential skill
- Success and failure in reading are opposite sides of the same coin- it's the same theory, not two theories, one for success and another for failure
- Instruction is the key

How Do Children Learn To Read?

Phonological

And

Phonemic Awareness

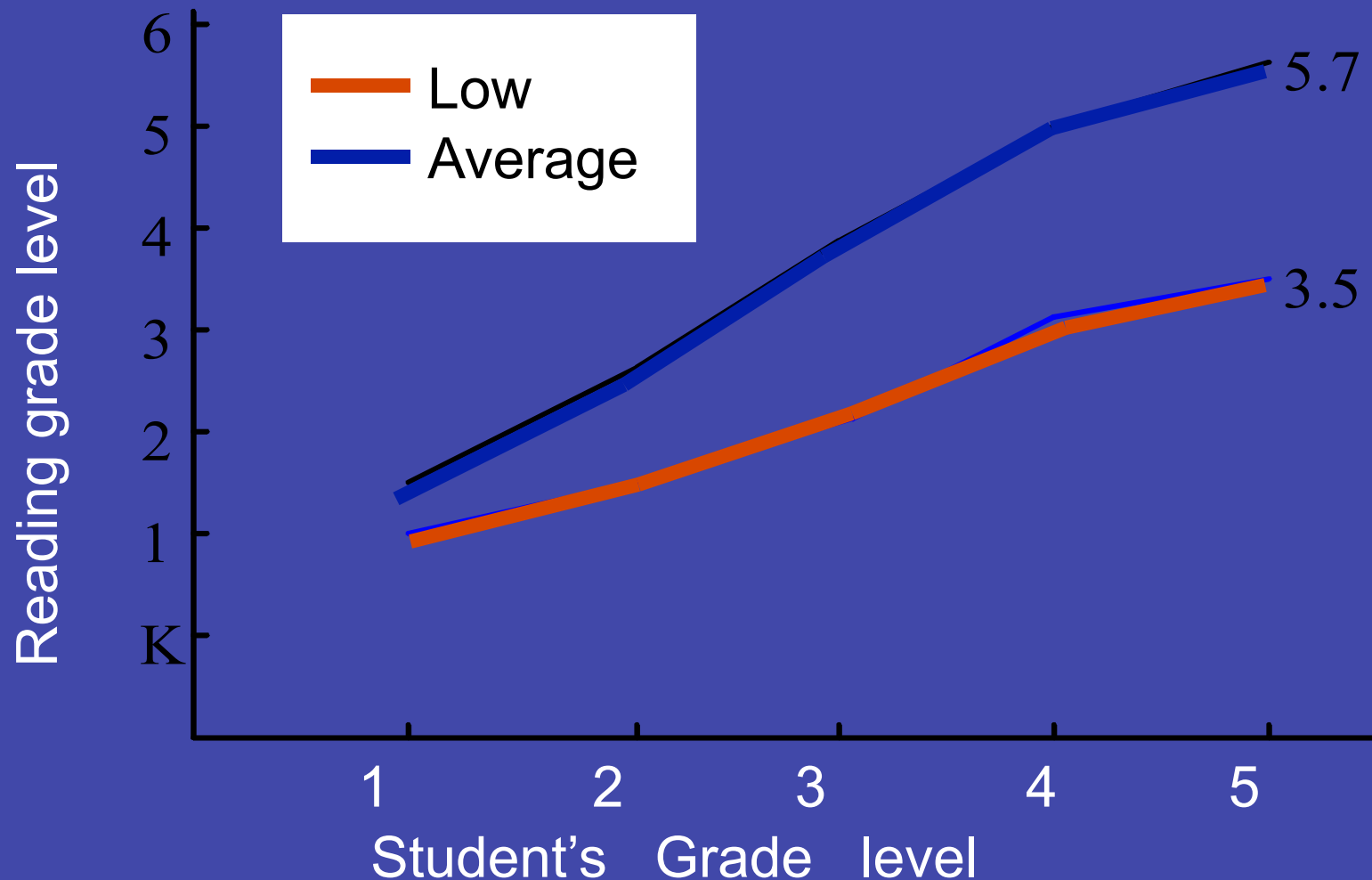


How Do Children Learn To Read?

Phonological Awareness:

- Phonological awareness involves the **understanding** that spoken words are composed of segments of sound smaller than a syllable.
- It also involves the **ability** to notice, think about, or manipulate the individual sounds in words.

Growth in word reading ability of children who begin first grade in the bottom 20% in Phoneme Awareness and Letter Knowledge (Torgesen & Mathes, 2000)



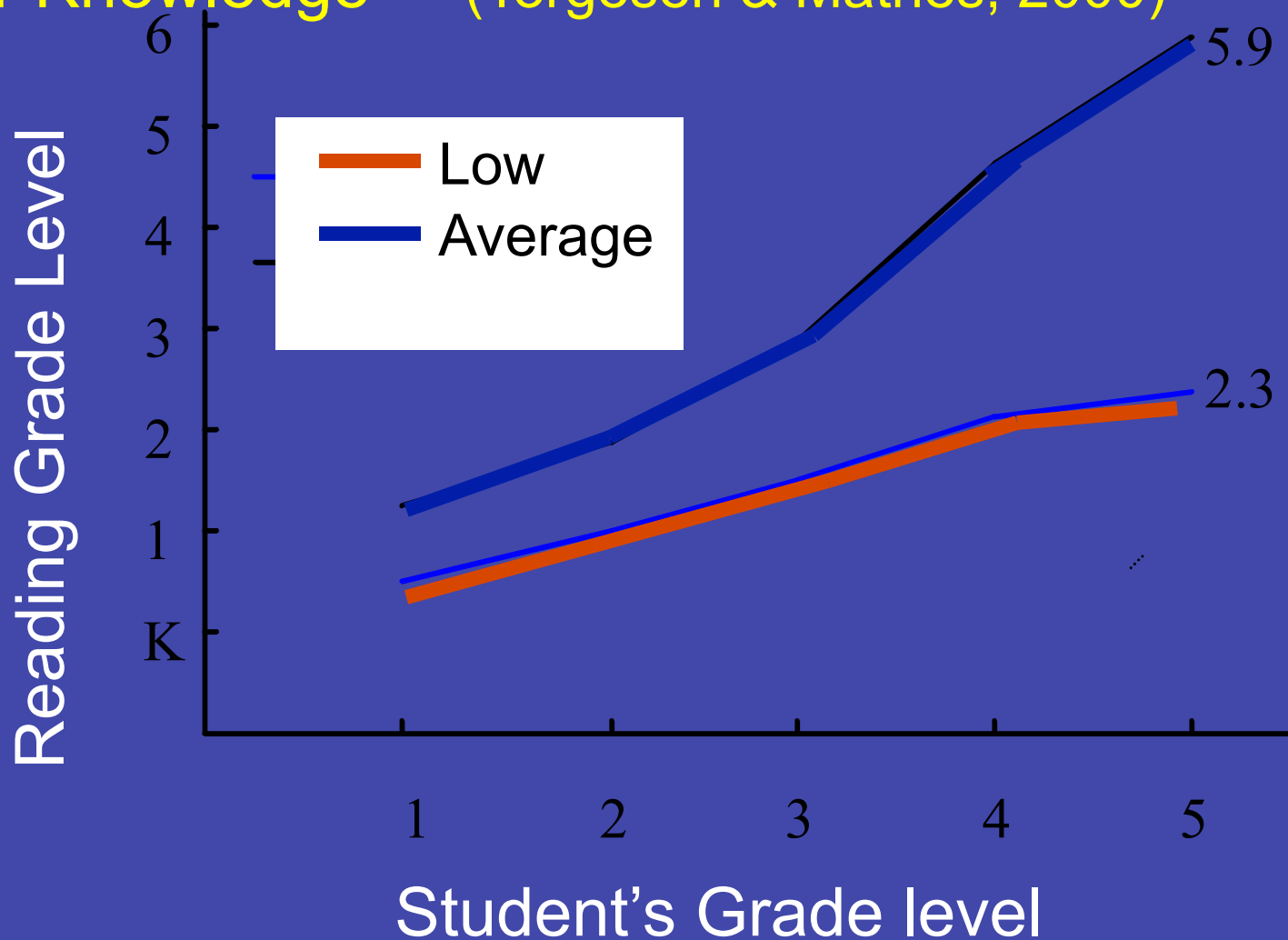


I NEED TO KNOW MY SOUNDS TO
READ!

How Do Children Learn To Read?

PHONICS

Growth in “phonics” ability of children who begin first grade in the bottom 20% in Phoneme Awareness and Letter Knowledge (Torgesen & Mathes, 2000)



The Alphabetic Principle:

Do We Know It? Can We Teach It?

- Print represents speech through the alphabet
- Words are composed of internal units based on sound called “phonemes”
- In learning to read, children must understand that words have internal structures linked to sounds
- Children vary considerably in how easily they master this principle

The Alphabetic Principle:

Do We Know It? Can We Teach It?

It is a kind of knowledge

Knowing what letters are used to represent which phonemes.....

It is a kind of skill

knowing how to pronounce these nonsense words.

bilt

fratchet

How Do Children Learn To Read?

FLUENCY

Reading Fluency

- Fluency is partly an outcome of word recognition
- “ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to decoding” (Meyer, 2002)
- “rate and accuracy in oral reading” (Shinn et al., 1992)
- “immediate result of word recognition proficiency” (NRP, 2000)

How Do Children Learn To Read?

**ORAL LANGUAGE
AND
VOCABULARY**

State accountability measures of reading comprehension are not all alike, but they typically:

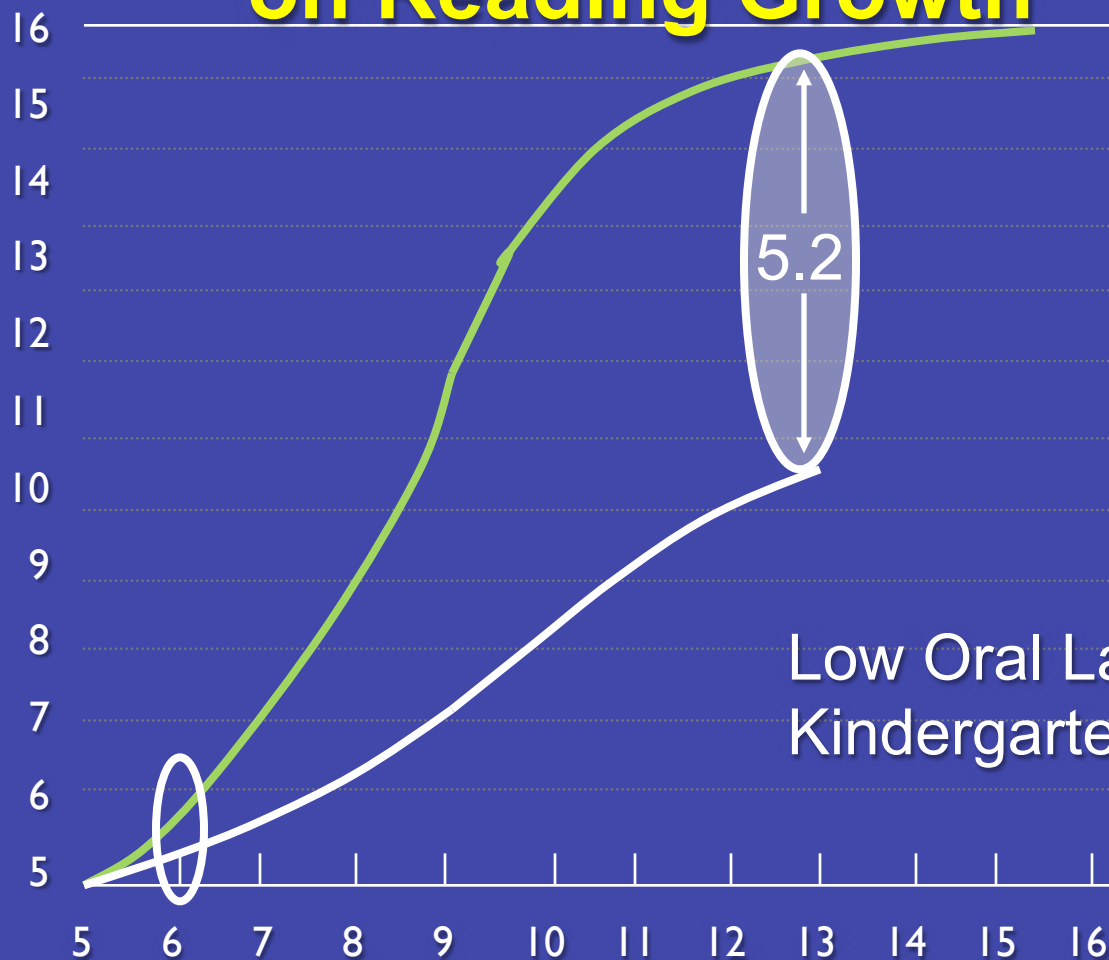
- Place high demands on vocabulary (word knowledge) and reasoning/ inferential skills. These demands accelerate significantly after elementary school.
- Require students to read relatively long passages before asking them to answer questions. This places special demands on reading fluency.

State accountability measures of reading comprehension are not all alike, but they typically:

- Require students to read relatively long passages before asking them to answer questions.
- This places special demands on reading fluency.

The Effects of Weaknesses in Oral Language on Reading Growth

Reading
Age
Level



High Oral
Language in
Kindergarten

Low Oral Language in
Kindergarten

Chronological Age

Hirsch, 1996



How many words should teachers teach per day to help close the gap?

- ▶ In 1st and 2nd grade, children need to learn **800+ words per year, about 2 per day.**
- ▶ Children need to learn **2,000 to 3,000 new words** each year from 3rd grade onward, **about 6–8 per day.**
- ▶ Research has shown that most typically developing children need to encounter a word about **12 times** before they know it well enough to improve their comprehension.

What the National Reading Panel Says About the Role of Vocabulary in Reading Instruction

Learning in rich contexts is valuable for vocabulary learning. Vocabulary words should be those that the learner will find useful in many contexts. When vocabulary items are derived from content learning materials, the learner will be better equipped to deal with specific reading matter in content areas.



What the National Reading Panel Says About the Role of Vocabulary in Reading Instruction

There is a need for direct instruction of vocabulary items required for each specific text.

Repetition and multiple exposure to vocabulary items are important. Students should be given items that will be likely to appear in many contexts.

(Reprinted from National Reading Panel, 2000, p. 4-4)

What the National Reading Panel Says About the Role of Vocabulary in Reading Instruction

cont.

Vocabulary learning is effective when it entails active engagement in learning tasks.

Computer technology can be used effectively to help teach vocabulary.

Isabel Beck: (2002) Both usefulness and frequency should be considered for all students. *Three tiers of vocabulary:*

Tier 1: basic, short-easy words (see, water, up, how)
August/ Snow add cognates to this basic level (map/ mapa) for ELL's who speak Spanish

Tier II: words that are critical to comprehension (every, while, although, never, reduce, expand, define, boldly, timidly)

Tier III: subject-matter-specific words (environment, trait)

What the National Reading Panel Says About the Role of Vocabulary in Reading Instruction

cont.

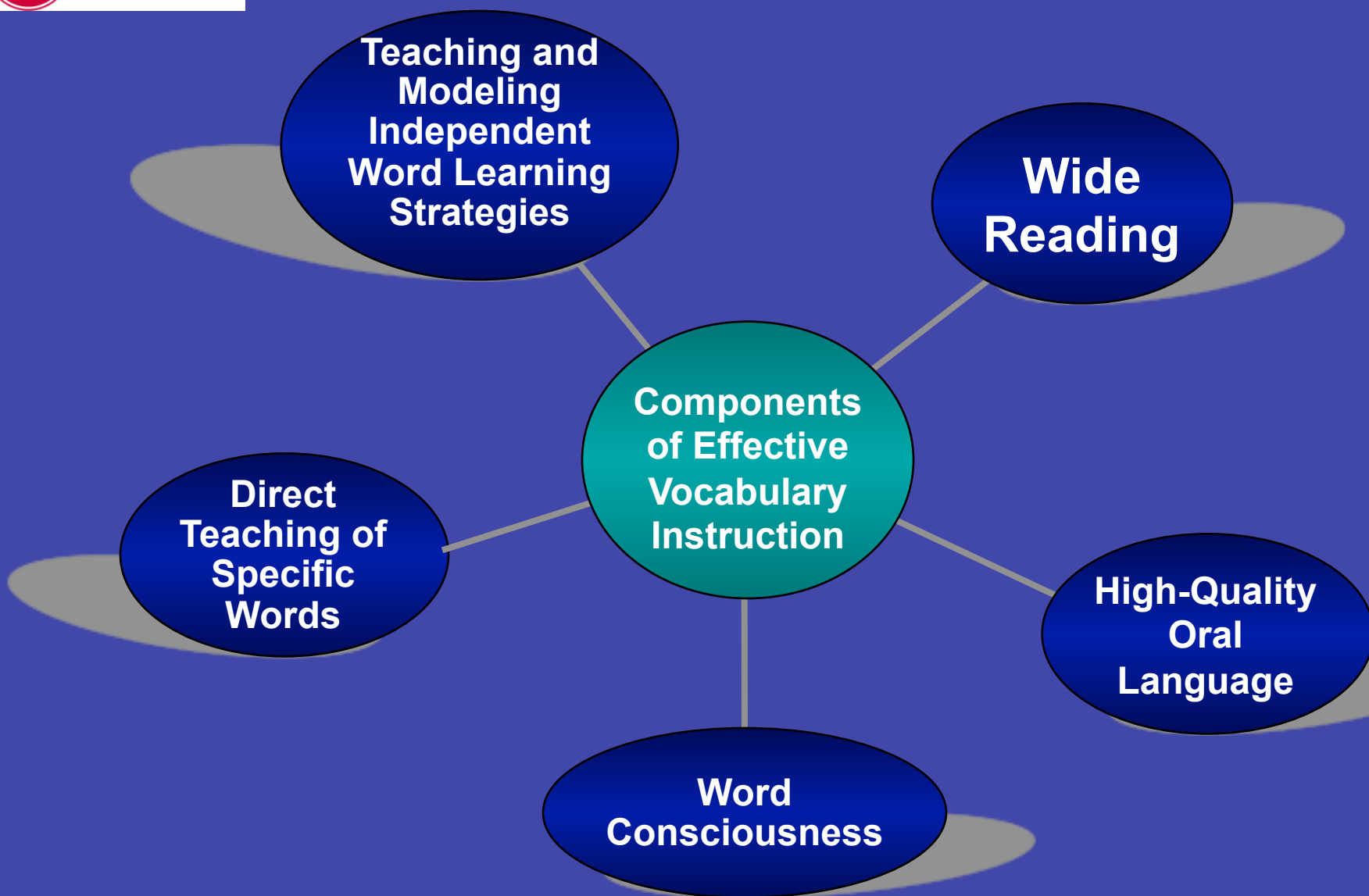
Dependence on a single vocabulary instruction method will not result in optimal learning.

A variety of methods used effectively with emphasis on multimedia aspects of learning, richness of context in which words are to be learned, and the number of exposures to words that learners receive.

(Reprinted from National Reading Panel, 2000, p. 4-4)

Important Footnotes for ELL's

- For ELL's a rich ORAL language foundation is key.
- For ELL's we must also explicitly teach high-frequency words and important content words
- For ELL's who speak romance languages like Spanish or French, it is important to teach cognates as a connection to academic English.



Rates of Yearly Improvement in Cohort 1 schools in First Grade across four measures (FCRR)

Measure	Estimated yearly increase in %GL from Yr1 to Yr 4	Estimated yearly decrease in %HR from Yr1 to Yr4
Phonemic Decoding	4.3%	2.0%
Oral Reading Fluency	2.7%	2%
Reading Comprehension.	1.3%	2.3%
Vocabulary	1%	.7%

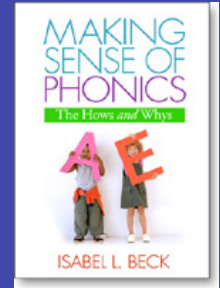
Rates of Yearly Improvement in Cohort 1 schools in Second Grade across three measures (FCRR)

Measure	Estimated yearly increase in %GL	Estimated yearly decrease in %HR
Oral Reading Fluency	2.7%	2.7%
Reading Comprehension.	2.3%	2.3%
Vocabulary	1.3%	1%

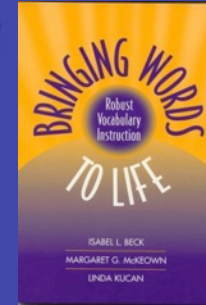


Four good, books for instructional ideas

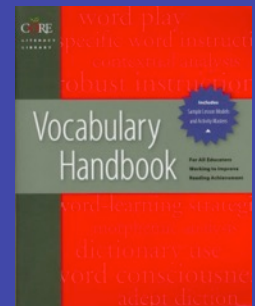
Making Sense of Phonics: The Hows and Whys
Isabel Beck: Guilford (2006)



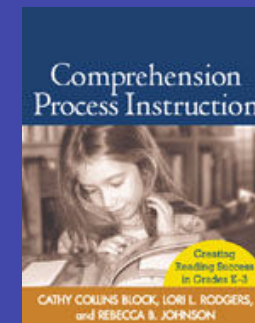
Bringing Words to Life: Robust Vocabulary Instruction
Beck, McKeown, & Kucan: Guilford (2002)



Vocabulary Handbook
Consortium on Reading Excellence (2006)



Comprehension Process Instruction:
Creating Success in Grades K-3
Block, Rogers, & Johnson (2004)



BREAK

READING COMPREHENSION

Which skills, knowledge, and attitudes are required for good reading comprehension, or proficient “grade level reading”?

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

In other words, a student's reading comprehension depends on:

How well they read the words on the page

How much knowledge they have, and how well they think

How motivated they are to do “the work” of comprehension



Reading Comprehension Non-Negotiables

- ▶ A student must be able to read correctly, approximately **95 percent**, of the words accurately in text to comprehend what is read.
- ▶ **MOREOVER**, to comprehend, a student must know the meanings of **90 to 95** percent of the words being read.



Enhanced instruction in critical content

- ✓ Students with limited literacy skills typically do not acquire enough content knowledge to meet standards
- ✓ Comprehension will not show long term improvement for struggling readers unless content area background knowledge is improved.
- ✓ When students have limited literacy, core curriculum teachers must compensate for their limited skills in the ways that they present the core content.
- ✓ Traditional secondary teacher planning and instruction focuses on planning to cover more content quickly and the result is poor content area learning for all students.



WHAT DOES IT TAKE TO UNDERSTAND WHAT YOU READ?

- Good readers are active readers
- They have clear goals in mind for their reading.
- They constantly evaluate whether the text, and their reading of it, is meeting their goals.
- Good readers typically look over the text before they read, noting such things as the structure of the text and text sections that might be most relevant to their reading goals.



WHAT DOES IT TAKE TO UNDERSTAND WHAT YOU READ?

- As they read, good readers frequently make predictions about what is to come.
- They read selectively, continually making decisions about their reading--what to read carefully, what to read quickly, what not to read, what to re-read, and so on.
- Good readers construct, revise, and question the meanings they make as they read.
- They draw upon, compare, and integrate their prior knowledge with material in the text.



WHAT DOES IT TAKE TO UNDERSTAND WHAT YOU READ?

- They think about the authors of the text, their style, beliefs, intentions, historical milieu, and so on.
- They monitor their understanding of the text, making adjustments in their reading as necessary. Good readers try to determine the meaning of unfamiliar words and concepts in the text, and deal with inconsistencies or gaps as needed.
- They evaluate the text's quality and value, and react to the text in a range of ways, both intellectual and emotional.



WHAT DOES IT TAKE TO UNDERSTAND WHAT YOU READ?

- Good readers read different kinds of text differently. For example, when reading narrative, good readers attend closely to the setting and characters
- When reading expository text they frequently construct and revise summaries of what they have read.
- For good readers, text processing occurs not only during 'reading' as we have traditionally defined it, but also during short breaks taken during reading, and even after the 'reading' itself has commenced.

The Many Strands that are Woven into Skilled Reading (Scarborough, 2001)

LANGUAGE COMPREHENSION

BACKGROUND KNOWLEDGE

VOCABULARY KNOWLEDGE

LANGUAGE STRUCTURES

VERBAL REASONING

LITERACY KNOWLEDGE

WORD RECOGNITION

PHON. AWARENESS

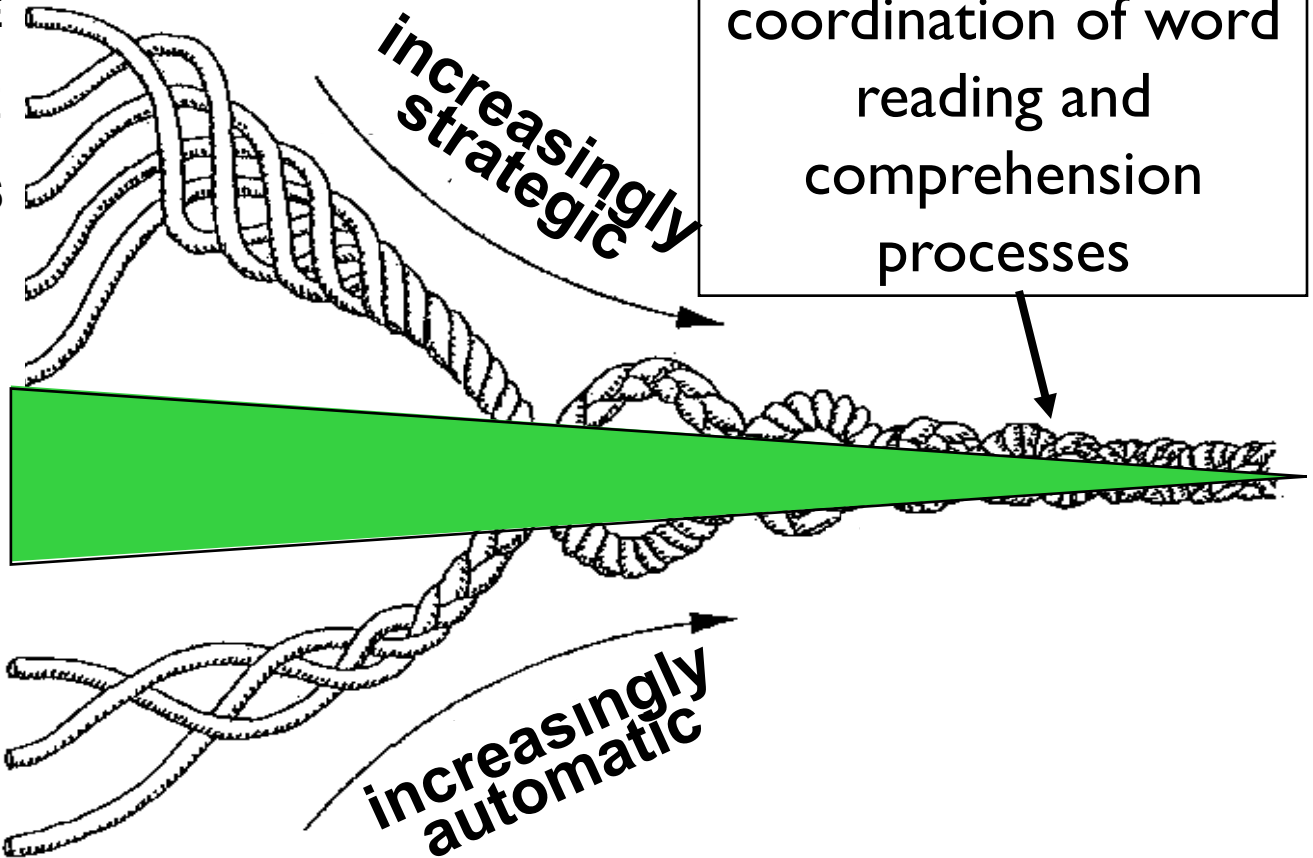
DECODING (and SPELLING)

SIGHT RECOGNITION

Skilled Reading- fluent
coordination of word
reading and
comprehension
processes

*increasingly
strategic*

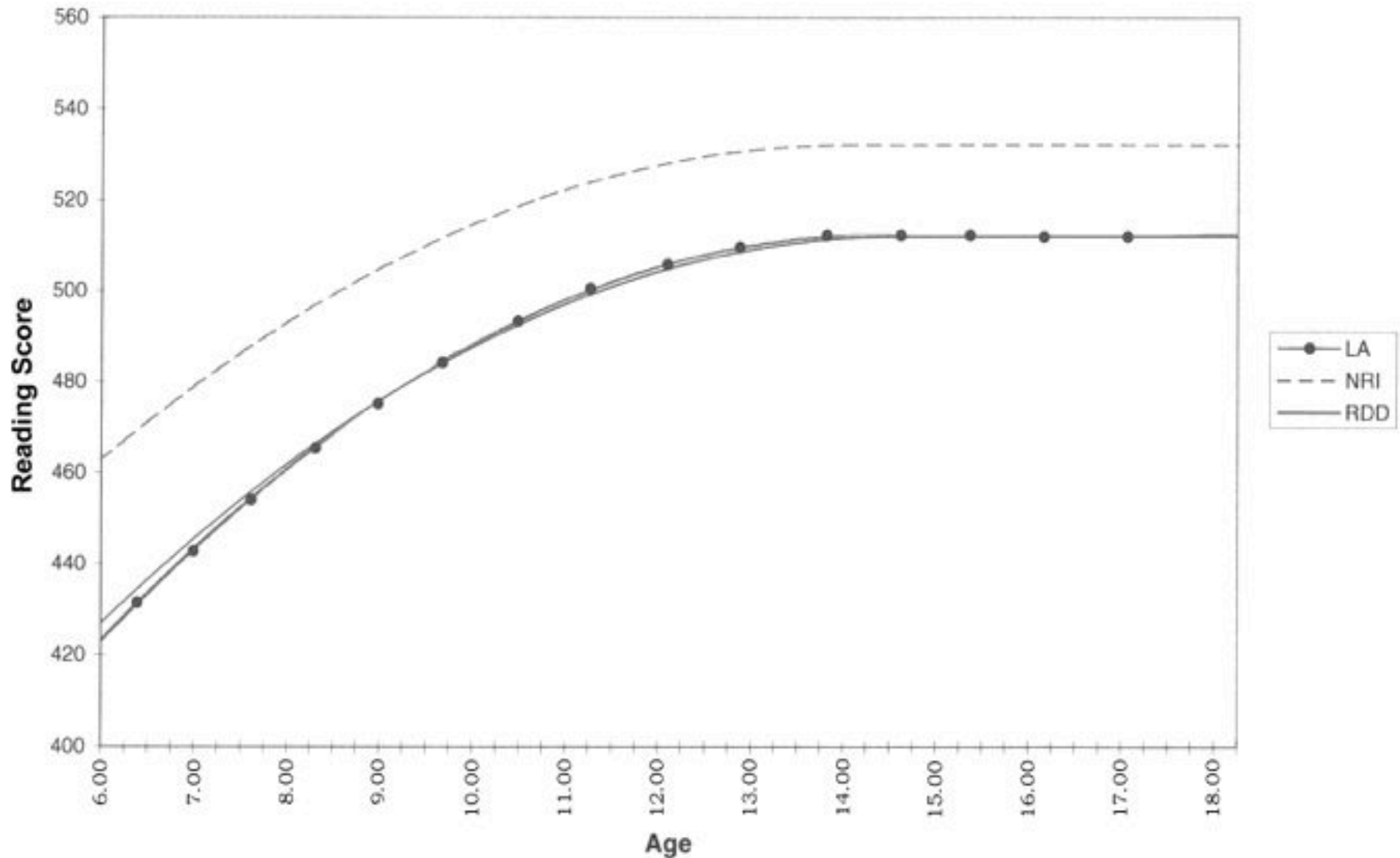
*increasingly
automatic*



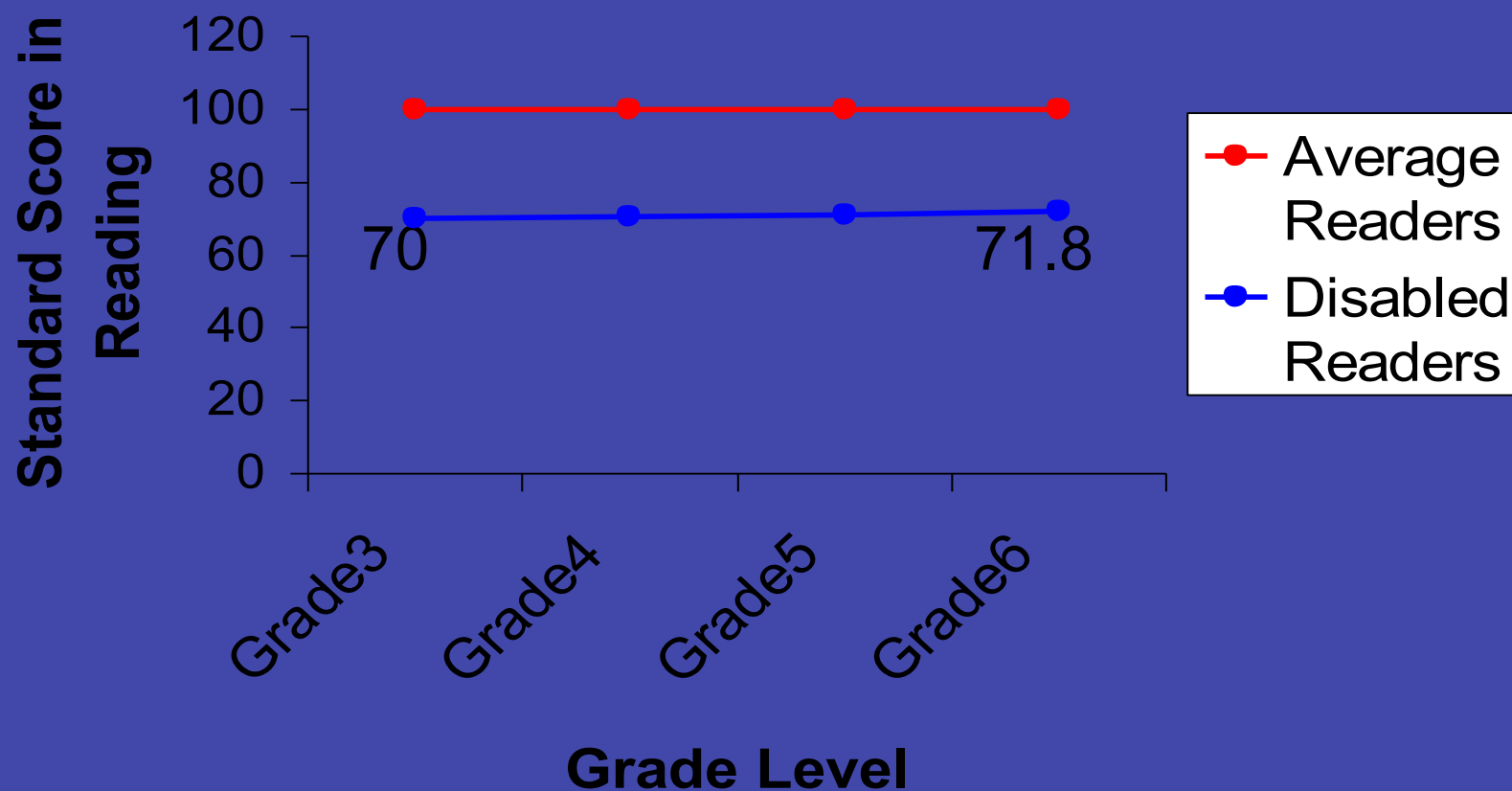


PREVENTION, EARLY INTERVENTION, AND REMEDICATION

Francis et al. (1996)



Change in Reading Skill for Children with Reading Disabilities who Experience Growth in Reading of .04 Standard Deviations a Year





HOW CAN WE PREVENT READING FAILURE?

- Development of Sensitive and Valid Screening Measures
- Professional Development and Use of a Professional Common Language
- Implementation of Three-Tier Models
- Continuous Assessment of Progress
- Appreciation of School Leadership and Capacity Factors

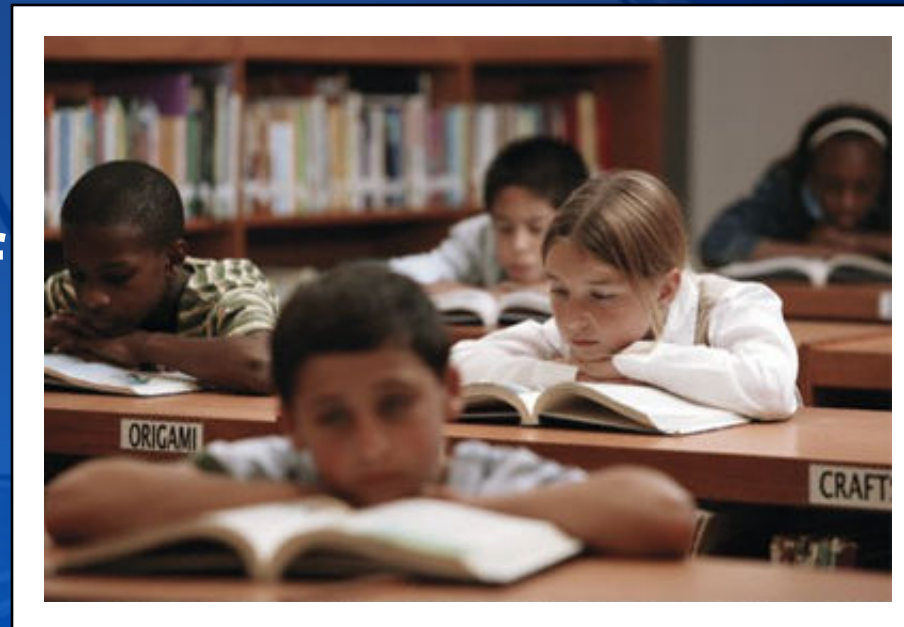


Early Intervention is Possible

- Risk characteristics present in Kindergarten and G1
- Letter sound knowledge, phonological awareness, oral language development
- Assess all children and INTERVENE- first in the classroom and then through supplemental instruction

Early Intervention is Effective

- Prevention studies in reading (and behavior) commonly show that 70- 90% of at risk children (bottom 20%) in K- 2 can learn to read in average range (Fletcher, Lyon, et al., 2007)





The consensus view of most important instructional features for interventions

Interventions are more effective when they:

Provide systematic and explicit instruction on component skills that are deficient

Provide a significant increase in intensity of instruction

Provide ample opportunities for guided practice of new skills

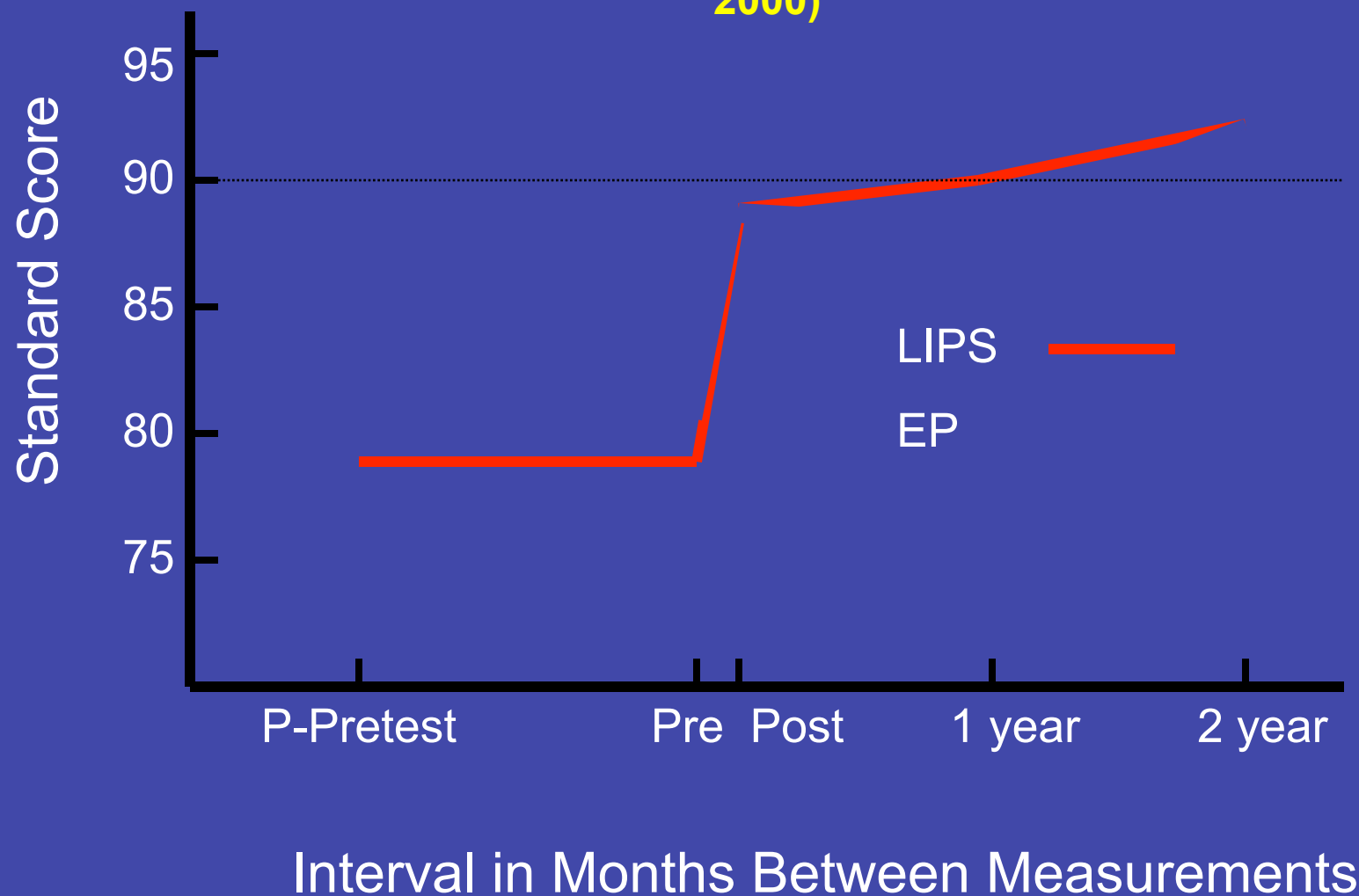
Provide appropriate levels of scaffolding as children learn to apply new skills

NICHD INTERVENTION STUDIES

Percent of children scoring below the 30th percentile

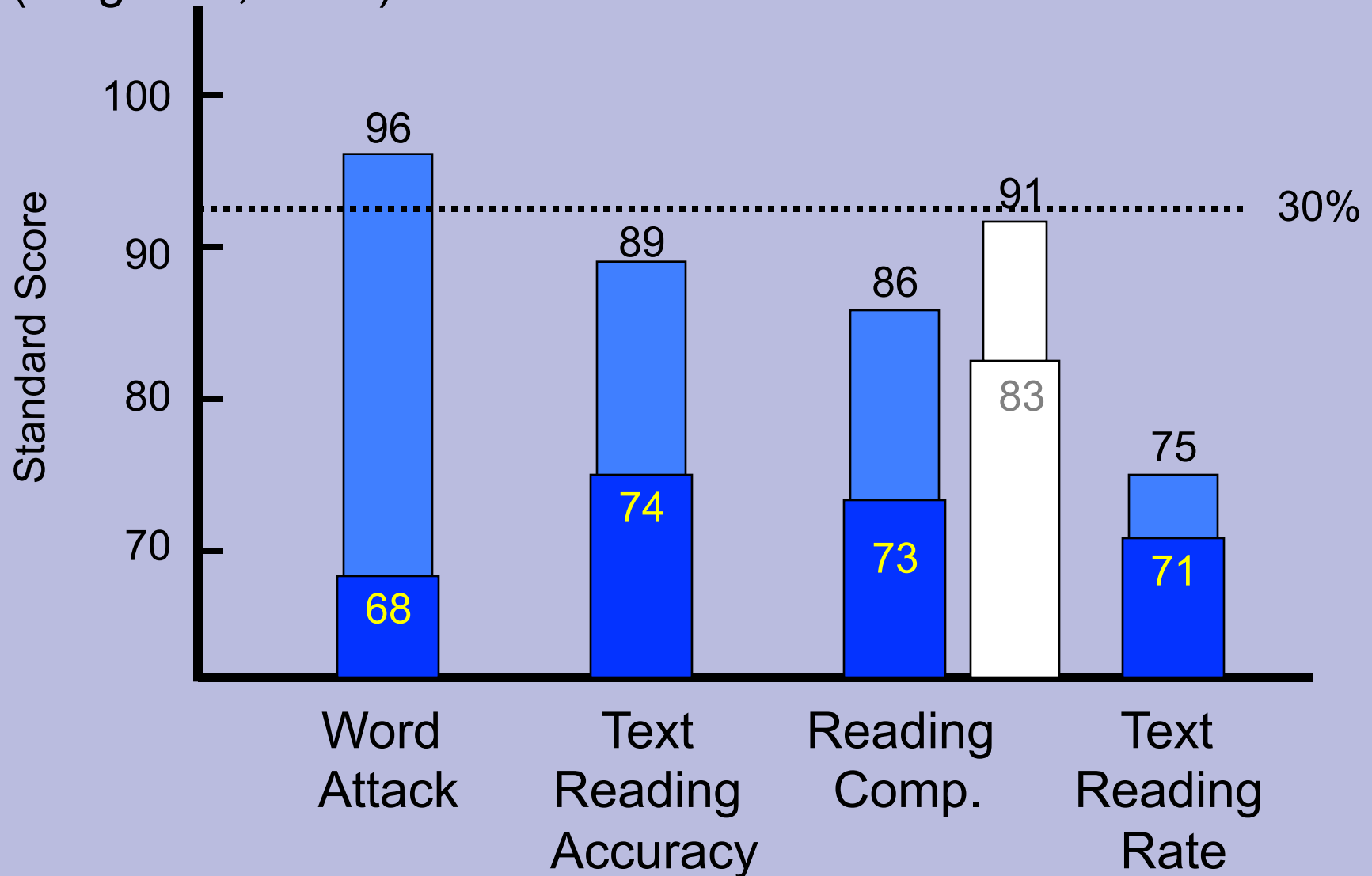
Study	Amt. of instruction	Pre RX	Post RX
Foorman	174 hrs.- classroom	35%	6%
Felton	340 hrs. - groups of 8	32%	5%
Vellutino	35- 65 hrs. 1:1 tutoring	46%	7%
Torgesen	88 hrs. 1:1 tutoring	30%	4%
Torgesen	80 hrs. 1:3 tutoring	11%	2%
Torgesen	91 hrs. 1:3 or 1:5 tutoring	28%	1.6%
Mathes	80 hrs. 1:3 tutoring	31%	.02%

Growth in Total Reading Skill Before, During, and Following Intensive Intervention (Torgesen, 2000)





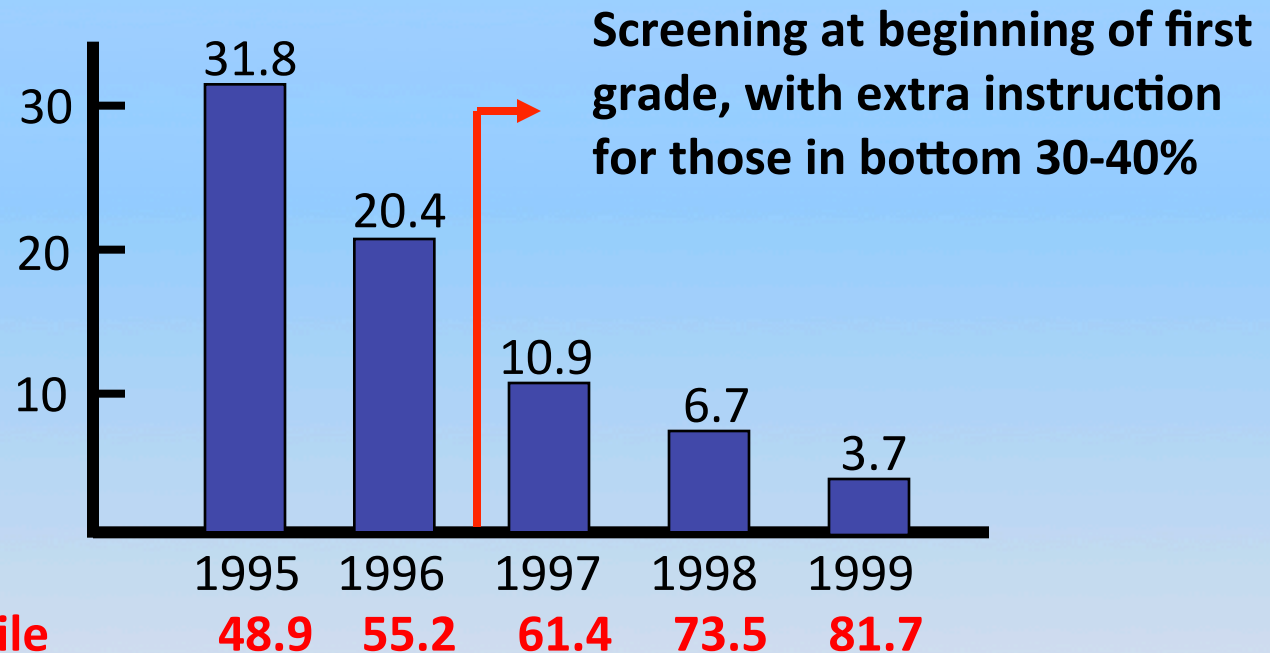
Outcomes from 67.5 Hours of Intensive LIPS Intervention (Torgesen, 2001)





Hartsfield Elementary Progress over five years (Torgesen & King)

Proportion falling
below the 25th
percentile in word
reading ability at the
end of first grade



Average Percentile
for entire grade (n=105)


HOWEVER

Even the very best prevention programs leave behind 2-6% of the school population

We need to reduce the numbers in order to effectively implement remedial programs

Linking Prevention and Remediation: A 3-Tier Model

If progress is inadequate, move to next level.



Tier 1: Primary Intervention

Enhanced general education classroom instruction for all students.

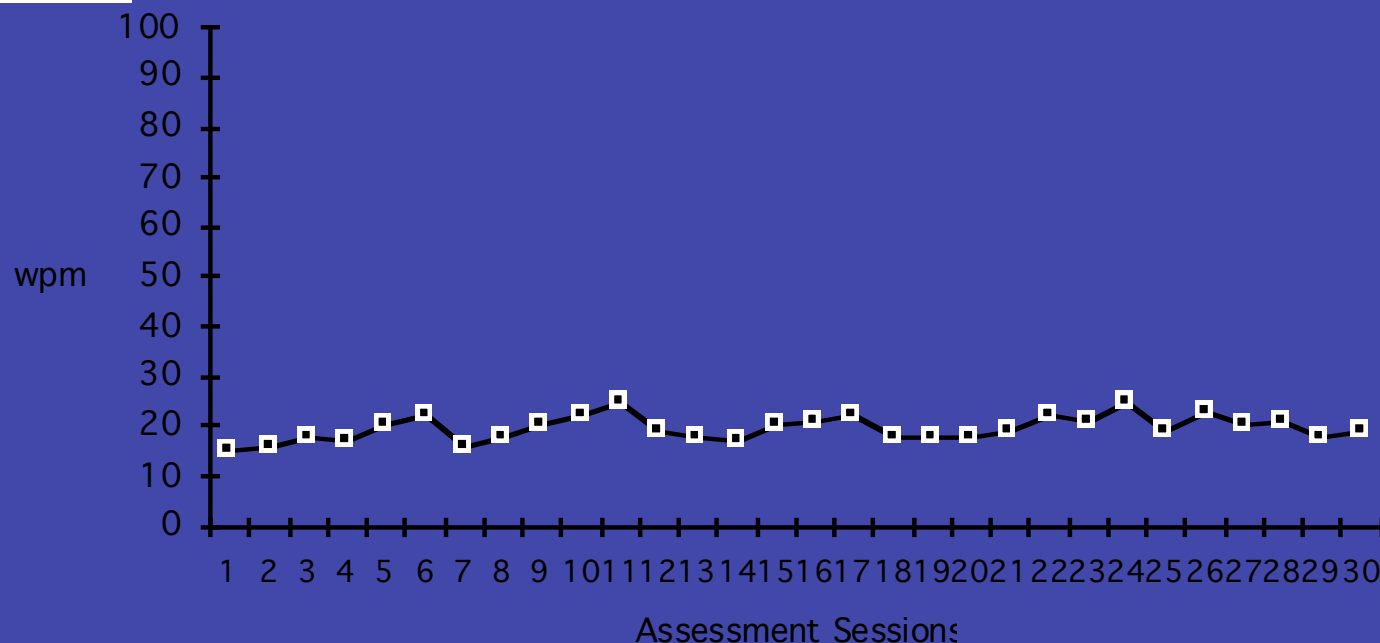
Tier 2: Secondary Intervention

More intense intervention in general education, usually in small groups.

Tier 3: Tertiary Intervention

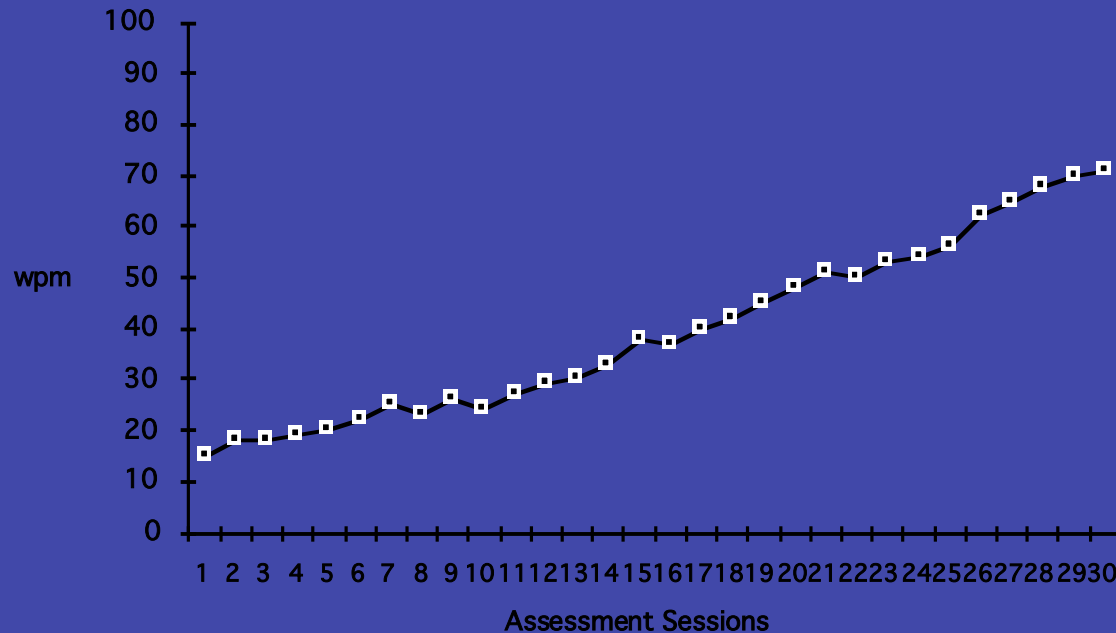
Intervention increases in intensity and duration. Child could be considered for special education

<http://www.texasreading.org/3tier/>



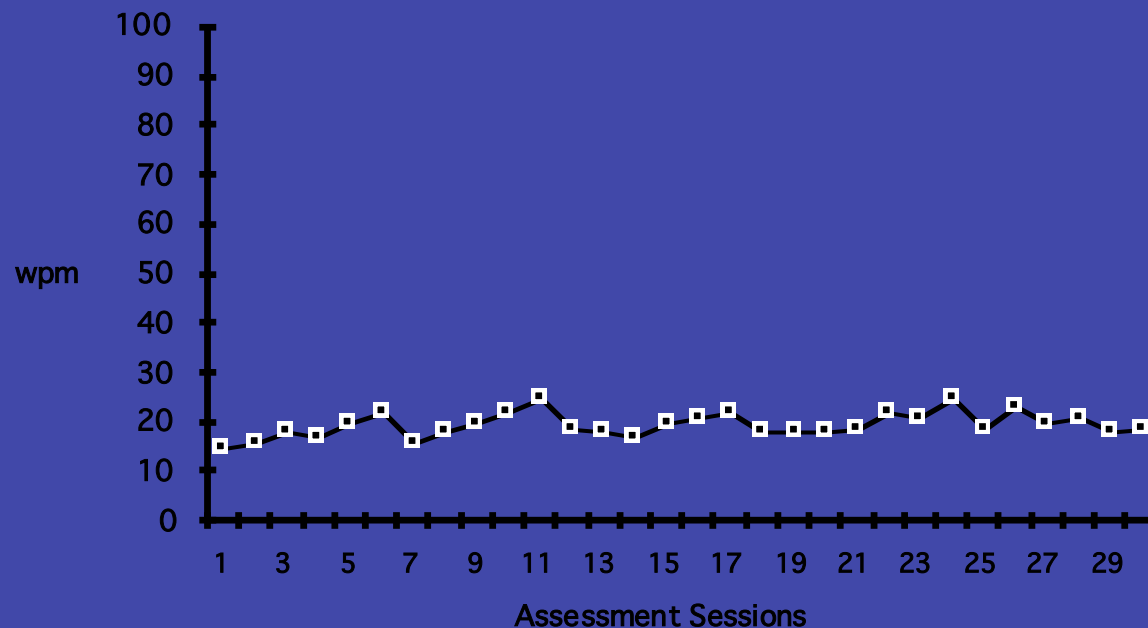
Description: Inadequate response to quality instruction.

This student has responded poorly to the intervention strategy. After an initial adaptation period of five days, the teacher implemented the strategy as designed for the duration of the intervention period. In spite of this assistance, the student's rate of learning throughout the period has been slow. This response-to-instruction pattern indicates that the student's lack of progress is more likely the result of learning difficulties than a lack of effective instruction. Specially designed instruction is likely needed for this student to acquire and retain new information (courtesy Joe Kovalesski)



Description: **Student responds well to quality instruction.**

This student responded well to the intervention strategy. After an initial adaptation period of six days, the teacher implemented the strategy as designed for the duration of the intervention period. With this assistance, the student's rate of learning throughout the period was steady and in a positive direction. This response-to-instruction pattern indicates that the student's difficulties are more likely the result of a lack of effective instruction than a disability. This student does not display a high degree of need for special education because he can demonstrate acquisition and retention with adapted instruction in the regular classroom (courtesy Joe Kovaleski).



Description: **Response to instruction cannot be determined.**

This student has responded poorly during the intervention strategy. However, in spite of support, the intervention was not implemented as planned throughout the intervention period. Consequently, it cannot be determined whether the student's lack of progress are more likely the result of learning difficulties or a lack of effective instruction. Another period of support is needed to assist the teacher to implement the strategy as designed in order to make a conclusion about this issue (courtesy Joe Kovaleski).

Implementation



In order to effectively prevent early reading difficulties, we need to apply two kinds of knowledge (Torgesen, 2008)

From the “science
of reading”



Information about the *individual* components of instruction and assessment that are most effective in raising literacy levels

From effective
schools



Information about leadership, organizational, and classroom practices that are most effective in raising literacy levels

Understanding, and Motivation to Apply



Barriers to Implementing Effective Assessment and Instructional Practices

- Focusing Too Many Resources on Administering and Collecting Assessment Data Rather Than Ensuring That Staff Use the Data to Inform Instruction**
- Viewing Purchased Programs as Silver Bullets Rather Than Aides to Assist Well Prepared Teachers Make Informed Instructional Decisions**
- Confusing Awareness Training With Implementation Training**
- Using Ineffective Practices to Train Teachers**

Barriers to Implementing Effective Assessment and Instructional Practices

- **Underestimating the Magnitude of Change**
- **Taking on Too Many Grade Levels and Schools the First year**
- **Beginning the Implementation Without a Comprehension Implementation Plan**
- **Failure to View the Implementation as a Systems Wide Change**

Two Important goals for Implementation and Improvement

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

Whether or not we achieve these goals depends on the strength of our instruction to accomplish two things during the year

All students who begin the year meeting grade level expectations continue to meet grade level expectations at the end of the year-they make expected yearly growth

All students who begin the year reading below grade level accelerate their development so they make expected yearly growth plus catch-up growth

When there is great diversity among students in their talent and preparation for learning to read (Torgesen, 2008) . . .

little variation in teaching will usually result in limited student learning.



“Growth is directly proportionate to the quality and quantity of instructional time. When we looked at our data student by student, we saw a painful fact with painful clarity. Most students who start behind stay behind. Time-starved reading programs that rely on sudden growth bursts from extraordinary instruction rarely move students from the 5th-30th percentiles up to grade level.” P. 48

“Catch-up growth is driven primarily by proportional increases in direct instructional time. Catch-up growth is so difficult to achieve that it can be the product only of quality instruction in great quantity.” From *David*

Montague

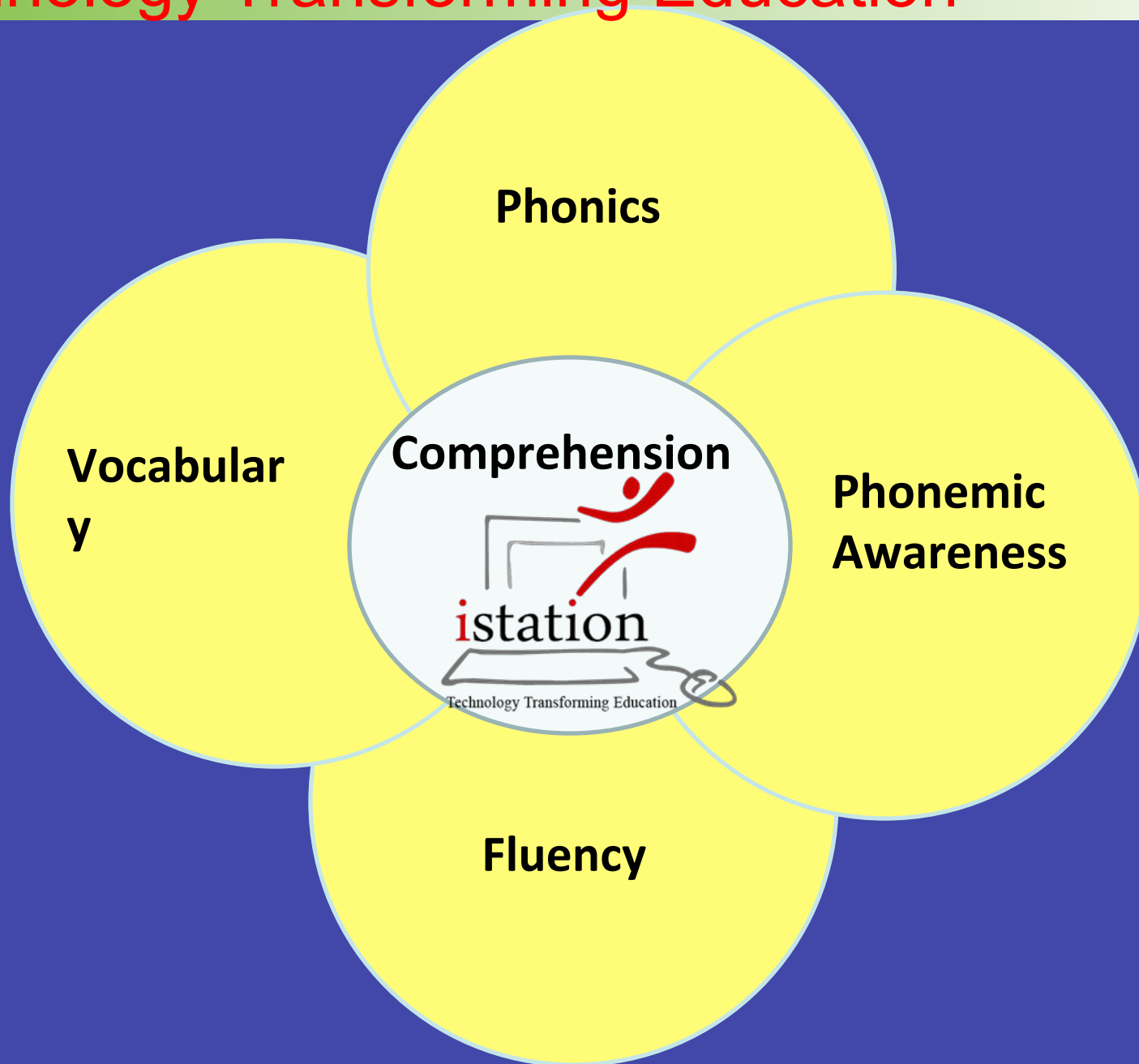


From *David Montague con*

”By the fifth year, I was convinced high performance reading was about more time and better use of that time. Students who were behind needed more direct instruction. Some of them started getting 60 to 90 minutes extra each day for a total of 180 to 210 minutes a day. We spent that time on the sub-skills they hadn’t mastered.”

“For most of Kennewick’s high performance elementary schools, increasing the amount of time spent on direct reading instruction was an intuitive decision. They tried more time. It worked, and they kept on doing it....Principals and many teachers at these schools saw the direct connection between increasing instructional time and increasing reading growth. Students who were a little behind needed a little more instructional time. Students who were a lot behind needed a lot more time.” P. 38.

Technology Transforming Education





SOME IMPLEMENTATION Ps & Qs

► First Things First

- Learn the Innovation
- Learn How to Implement With Fidelity
- Do it Long Enough to Learn the Nuances of its Applications
- Then Work on Improvements
- There is no Successful Innovation in a Box – Both the Innovation
- and the Implementation Plan Must be Customized



SOME IMPLEMENTATION

Ps & Qs

► Typical Improvements

- Assessment Calendar
- Data Analysis Practices
- Grouping Practices
- Timing of Innovation in the Mater Schedule
- Model for Innovation Delivery

PROFESSIONAL DEVELOPMENT

**Creating Effective Schools by
Preparing Effective Leaders**



A Leader Must Ensure the Following:

- Evidence-Based Curriculum
- Continuous Evaluation and Accountability
- Challenging Goals for Both Students and Teachers
- Opportunity to Learn and Sufficient Time for Instruction
- Parental Involvement
- Safe and Orderly Environment
- Collegiality and Collaboration

EFFECTIVE LITERACY INSTRUCTION REQUIRES

- ▶ Ability to Customize Instruction for Individual Students
- ▶ Ability to Manage and Organize the Classroom
- ▶ Ability to Motivate and Engage Students
- ▶ A Positive Attitude Towards Teaching
- ▶ Ability to Implement and Sustain Programs

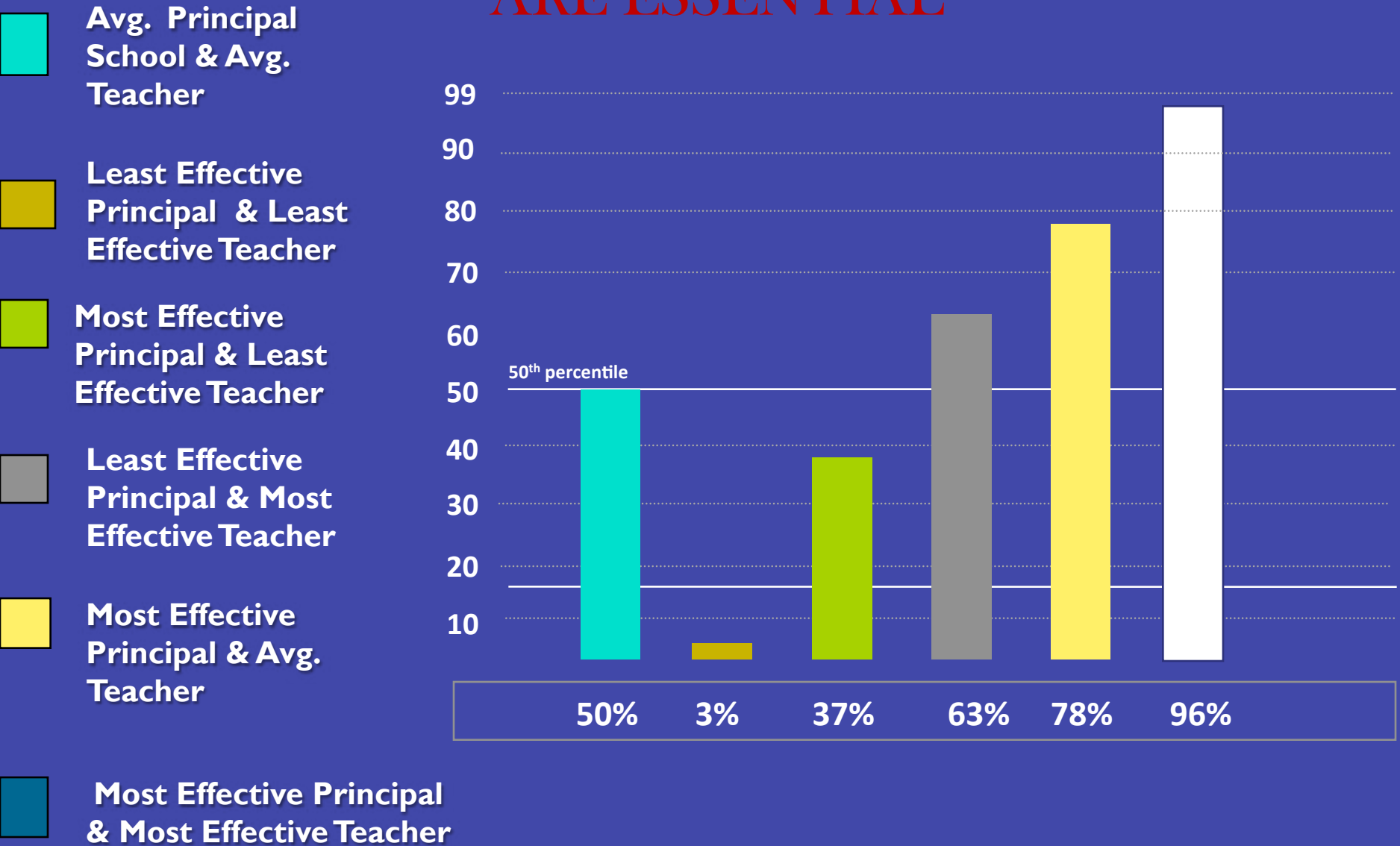
EFFECTIVE LITERACY INSTRUCTION REQUIRES

- Deep Knowledge of Content and Instructional Skills
- Ability to Plan and Set Specific Goals and Objectives
- Knowledge of Scientifically-Based Curriculum Design
- Knowledge of Research-Based Instructional Methods
- Knowledge of Formative and Summative Assessment

WHY EFFECTIVE LEADERS & TEACHERS



ARE ESSENTIAL





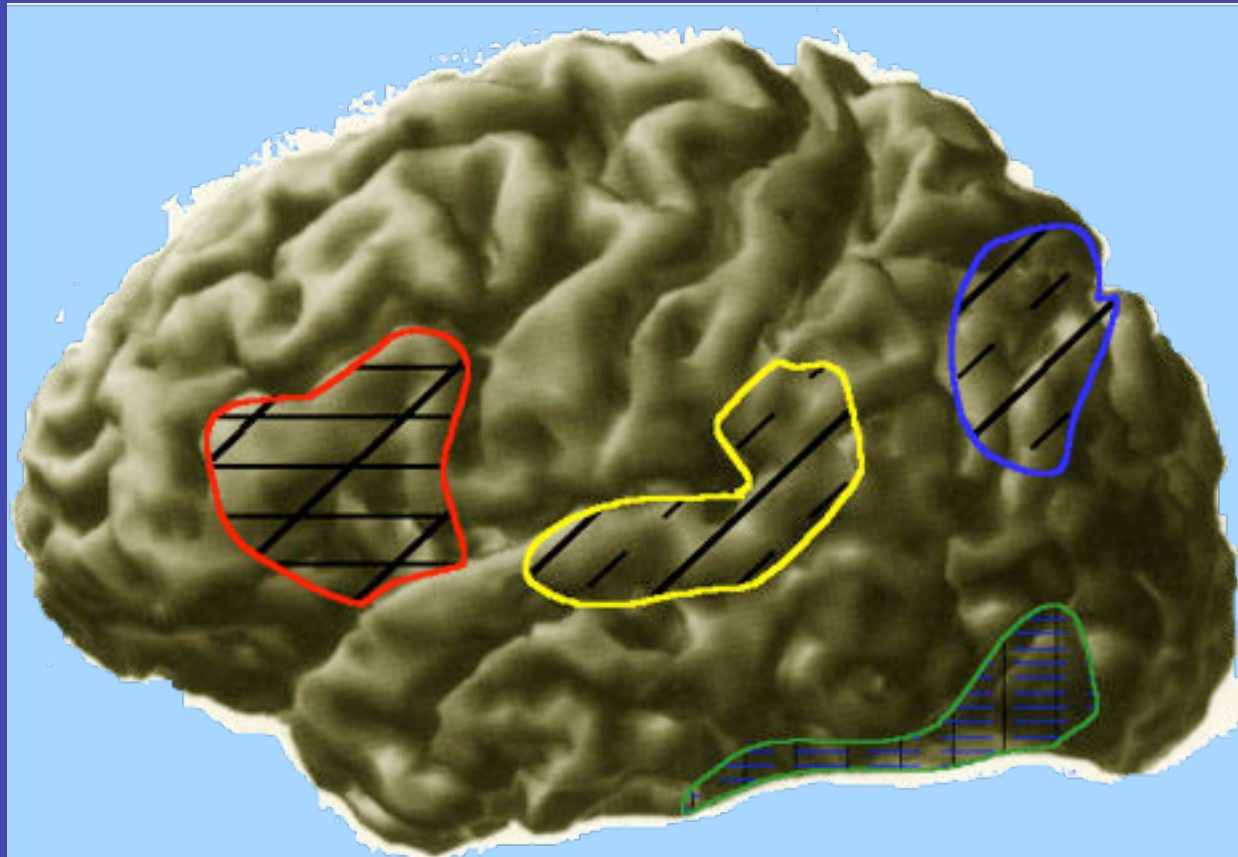
IMPROVING READING AND CHANGING BRAINS



A Theoretical Model for the Brain Circuit for Reading (Component Processes)

Phonological processing:
correspondence between
letter and sound

Phonological
processing:
articulatory
mapping



Relay station;
Cross-
modality
integration

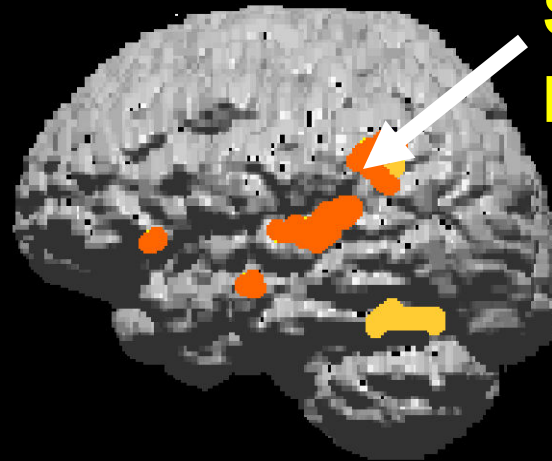
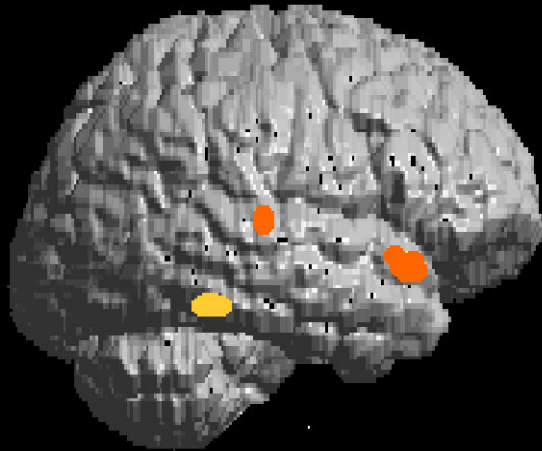
Graphemic
analysis



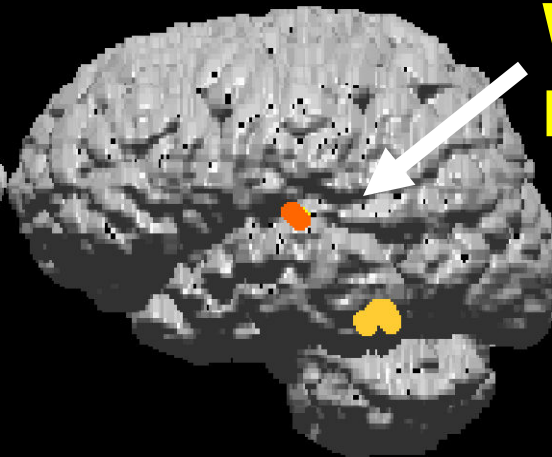
Child #1: Normal Reader
Child #12: with Reading Difficulties

Right Hemisphere

Left Hemisphere



Strong activation pattern



Weak activation pattern

(Fletcher et al)

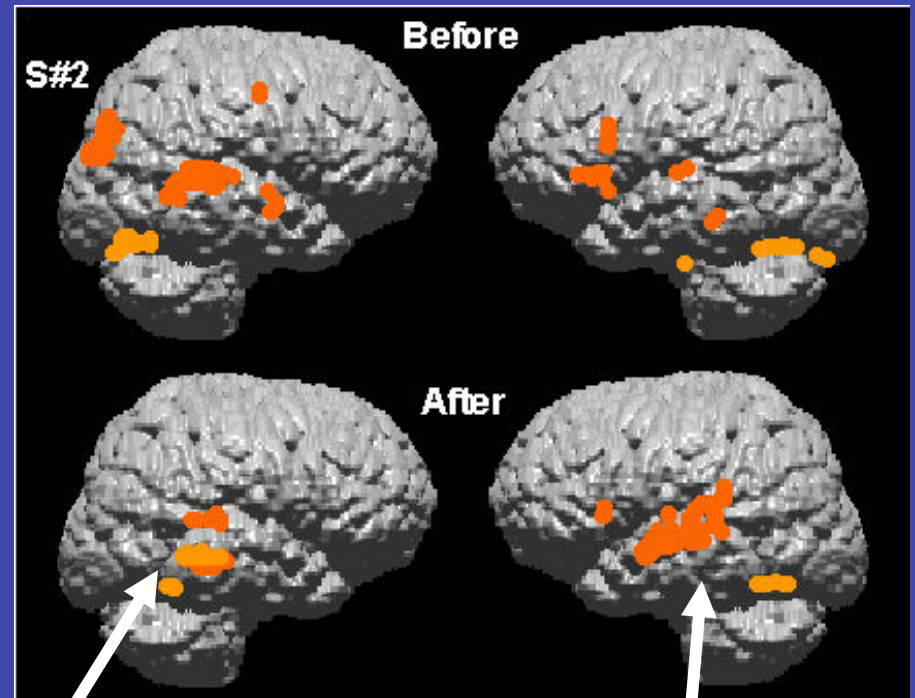
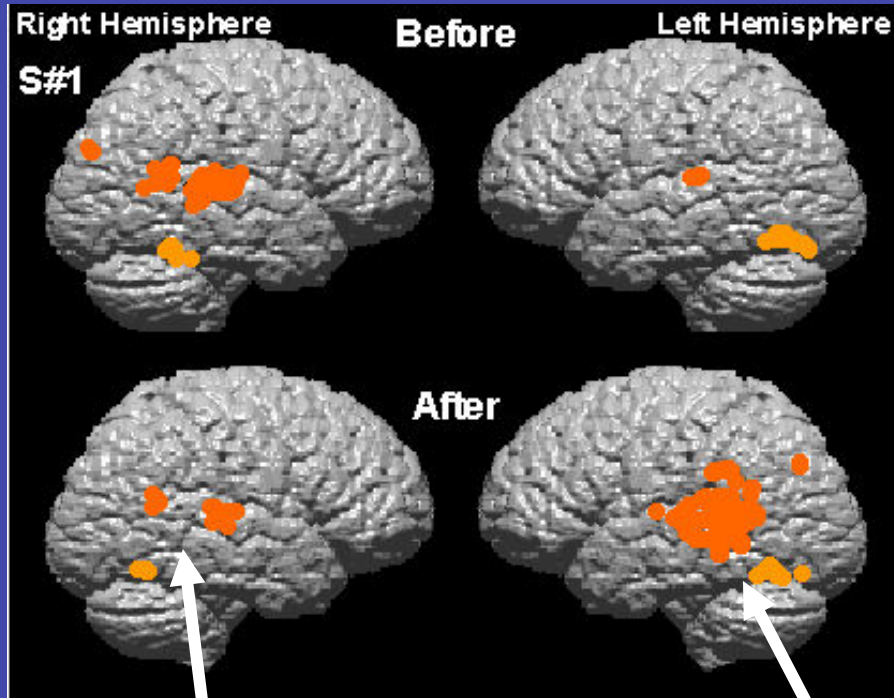


Right H.

Left H.

Right H.

Left H.



Decreased activity
in right hemisphere

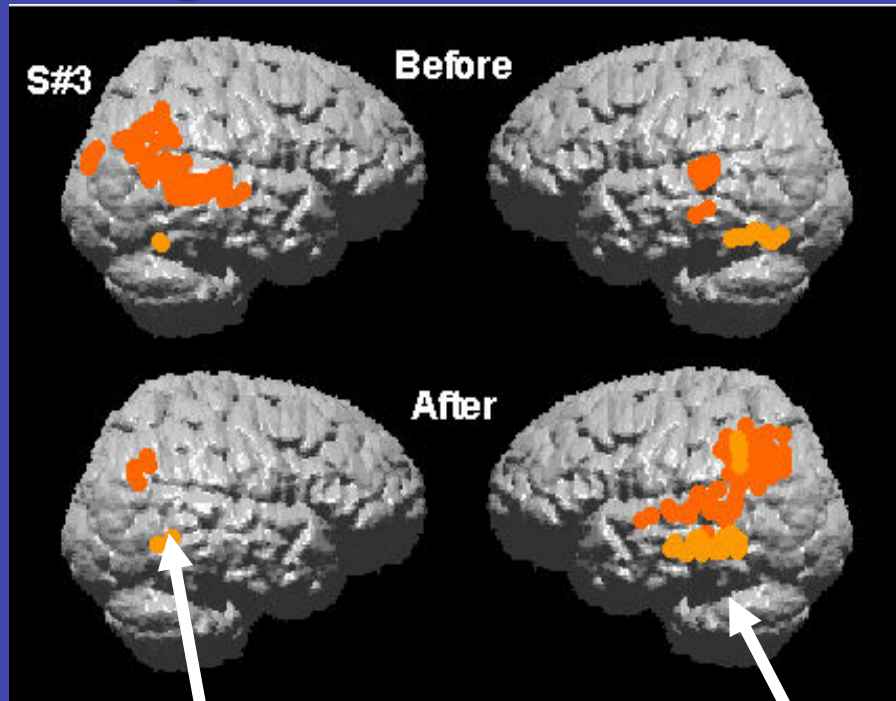
Increased activity in
left hemisphere

(Fletcher et al)



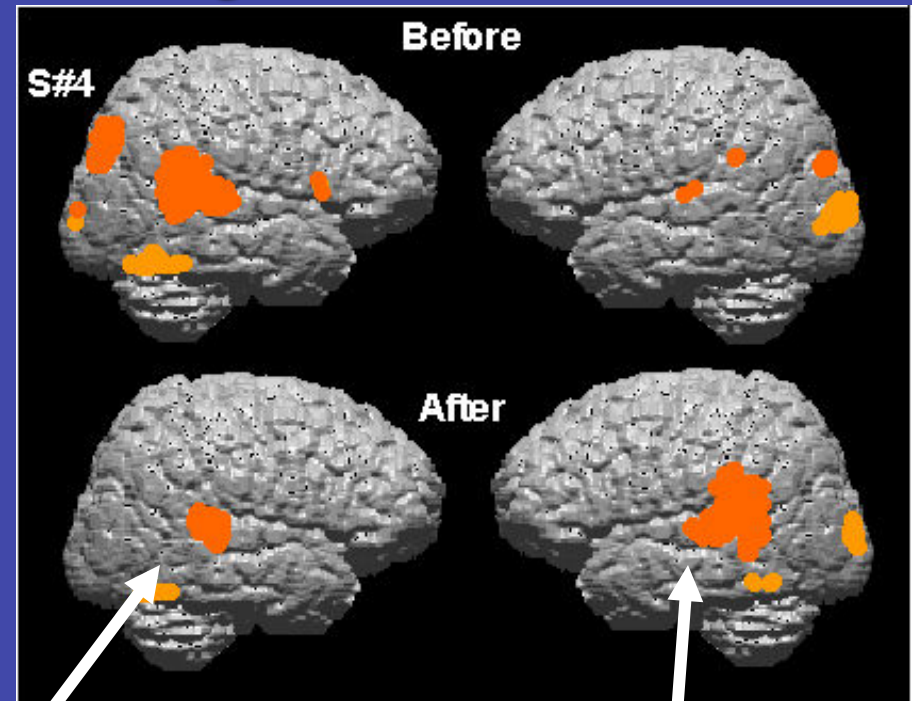
Right H.

Left H.



Right H.

Left H.



Decreased activity
in right hemisphere

Increased activity in
left hemisphere

(Fletcher et al)



Why Do Some Children Have Difficulties Learning to Read?

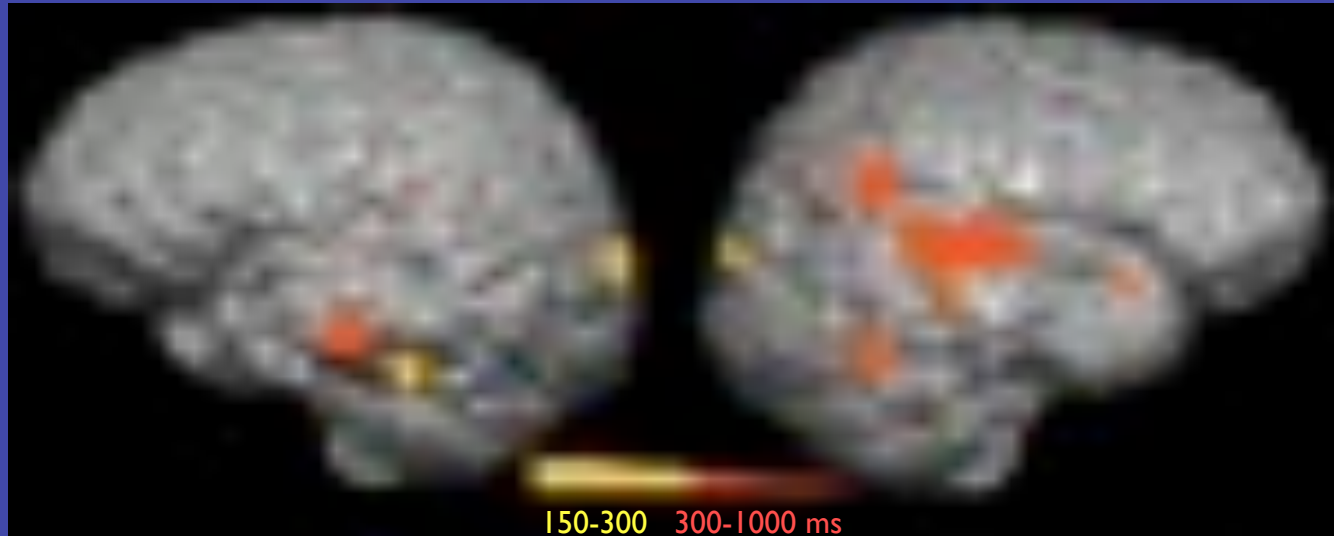
(panicolaou, Fletcher, et. al)

Left Hemisphere

Right Hemisphere

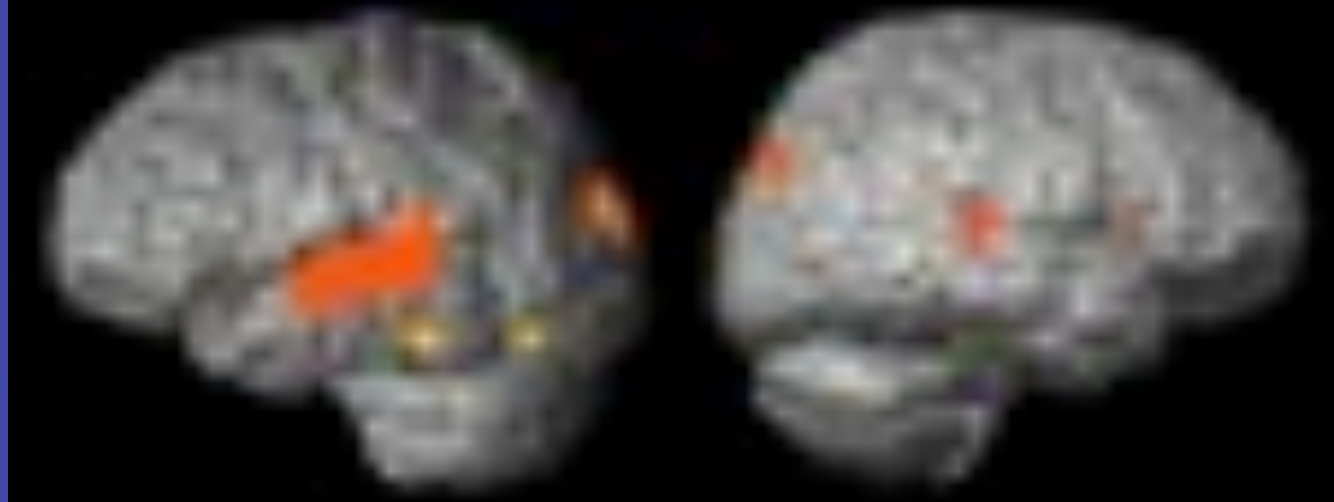
Student

#1: At risk



Student

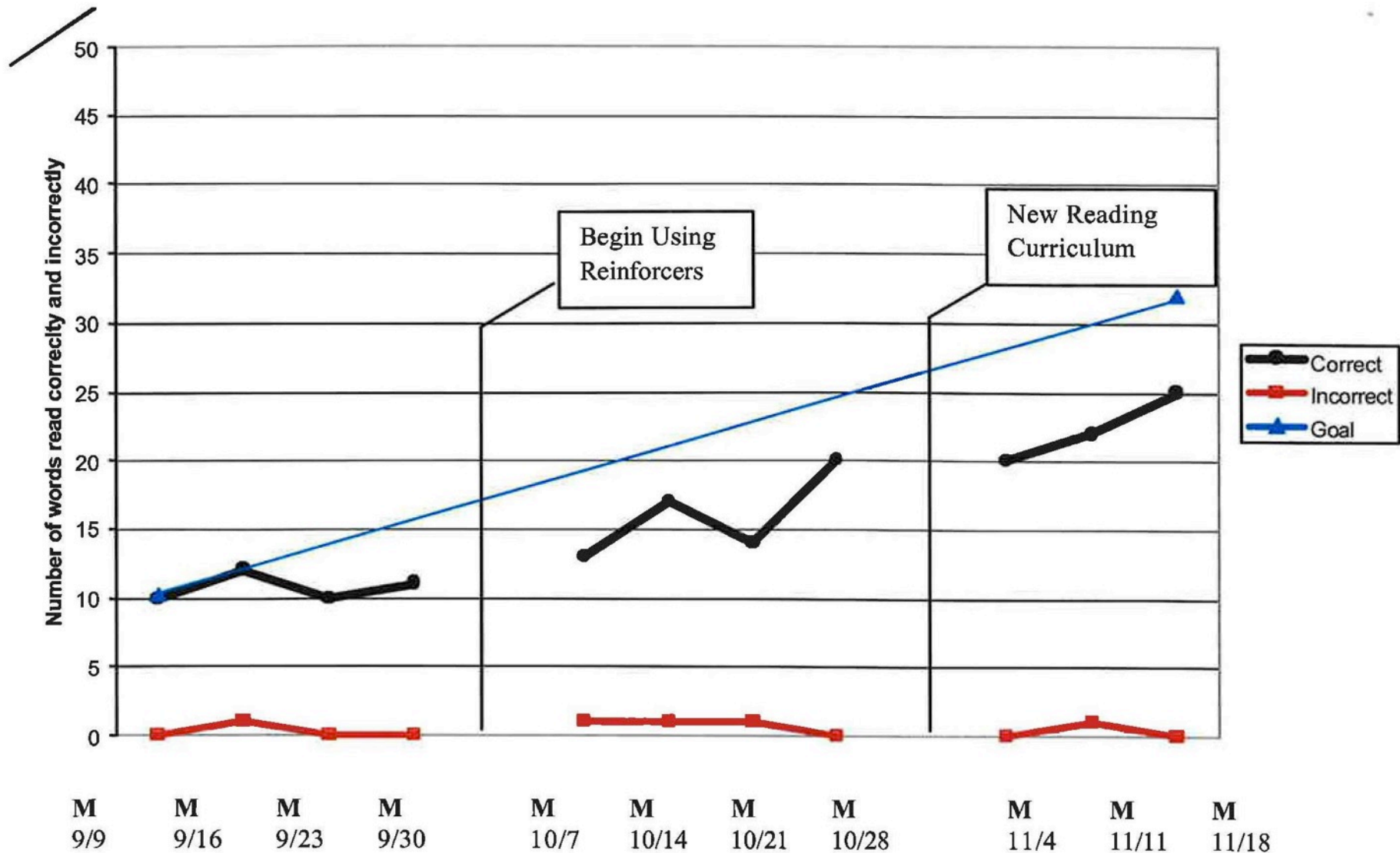
#31: Not at risk



Measuring the Effects of Scientifically -Based Instruction

Students Name:

Subject Area: Reading





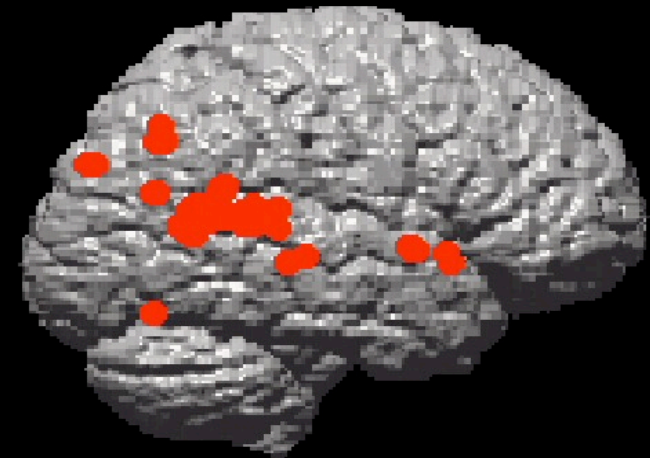
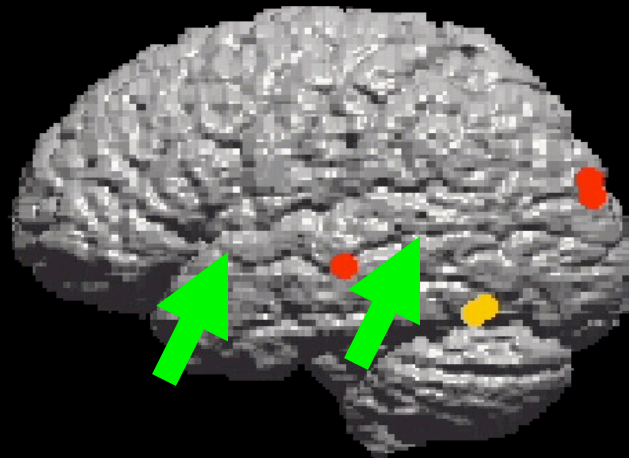
Why Do Some Children Have Difficulties Learning to Read?

Papanicolaou, et. al

Left Hemisphere

Right Hemisphere

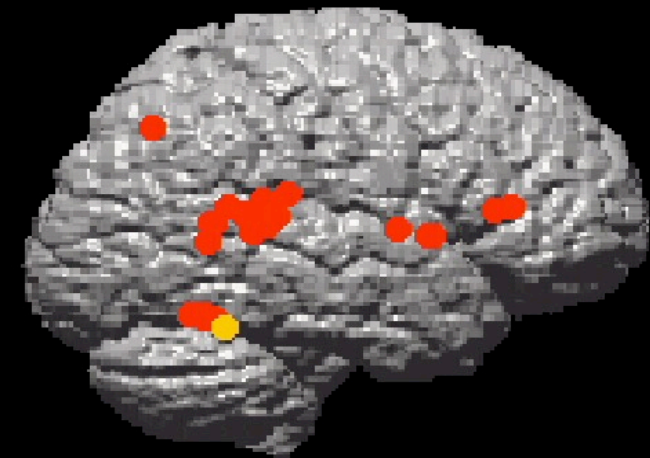
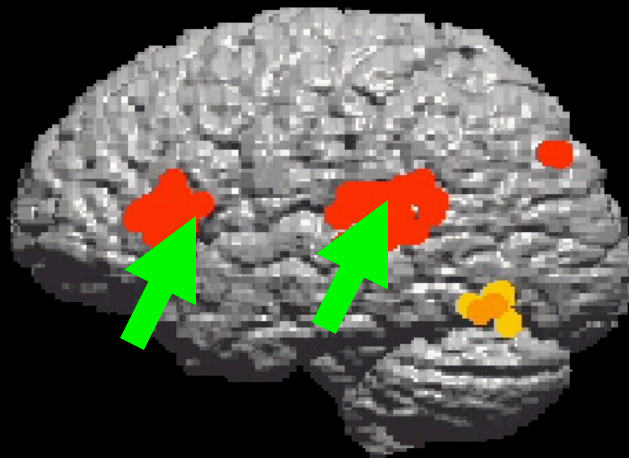
Kindergarten



Same Student one
year later



1st Grade





Moving Forward

“We are not where we want to be,
we are not where we are going to be,
but we are not where we were.”

Rosa Parks

For more information :
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Reading4all@tx.rr.com