

# RTI: Selecting and Implementing Evidence-Based Reading Interventions

Carolyn Denton, Ph.D.

Department of Pediatrics

University of Texas Health Science

Center Houston



- Current Understanding of Reading Difficulties and Disabilities
- Core Principles of RTI
- Evidence-Based Instruction and Intervention for Primary-Grade Readers
- The Implementation of Reading Interventions in RTI
- RTI in Reading in Middle School
- Schools that “Beat the Odds”

# Current Understanding of Reading Difficulties and Disabilities

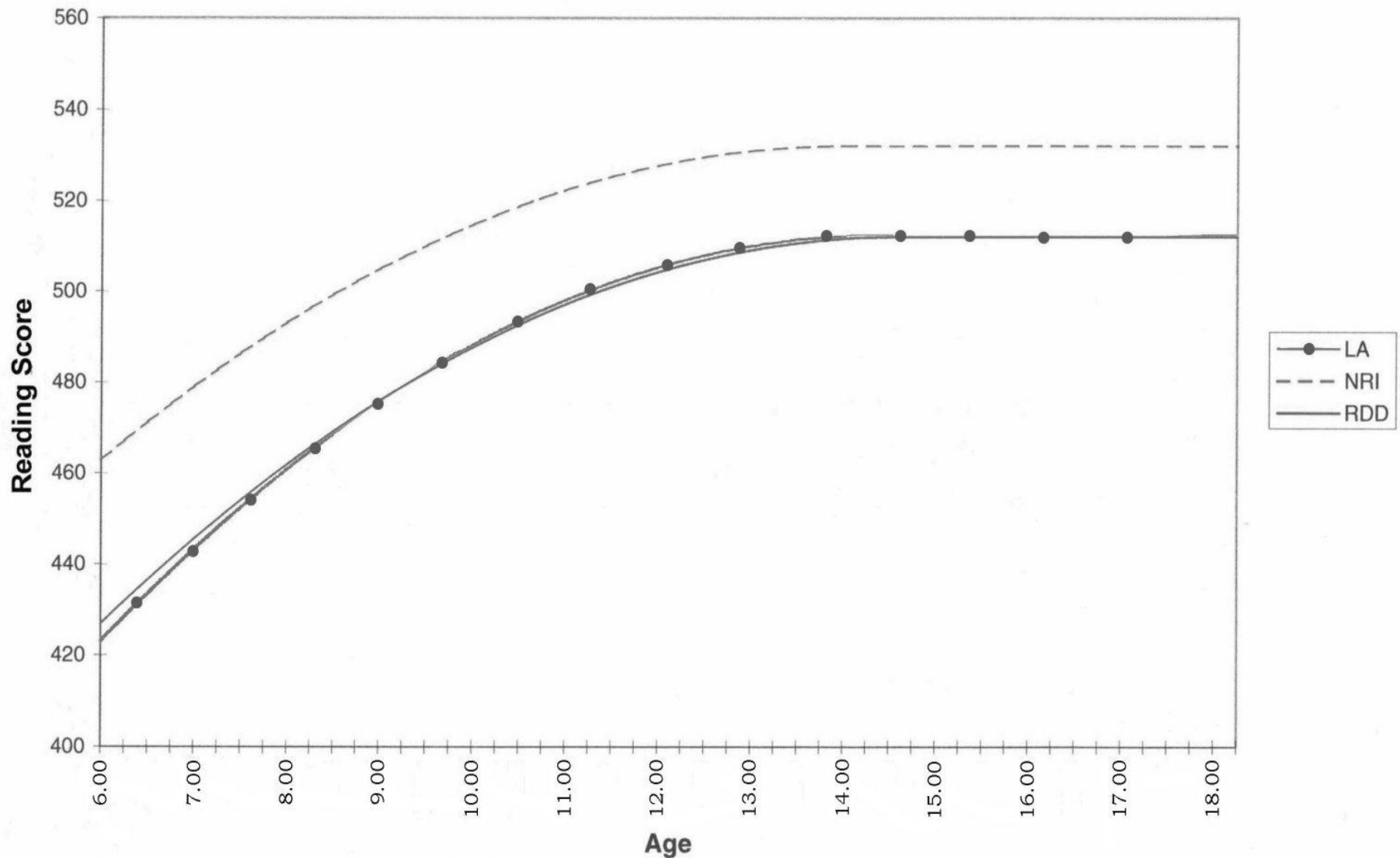


# ***Children Do NOT Outgrow Reading Difficulties***

A child who is a poor reader at the end of first grade has an almost 90% chance of remaining a poor reader at the end of Grade 4 (Juel, 1988) and at least a 75% chance of being a poor reader as long as they are in school (Francis et al., 1995)

....unless we provide quality intervention!

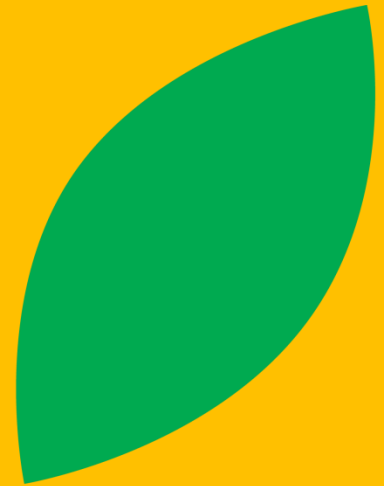
# Francis et al. (1996)



# Keep in Mind...

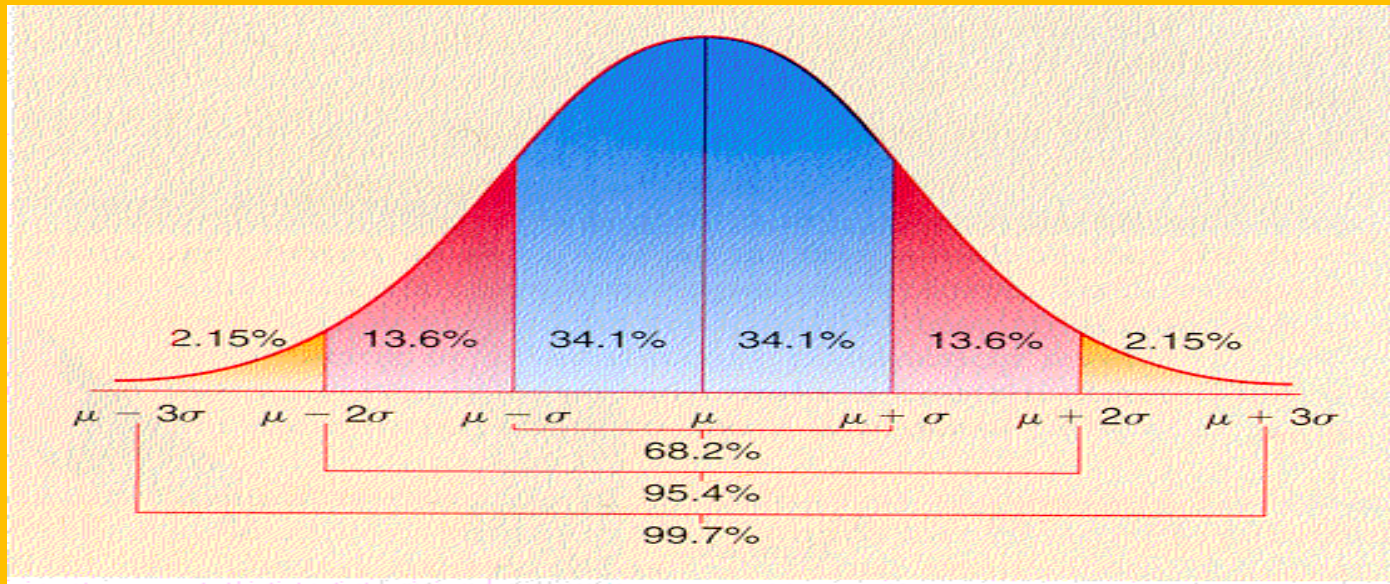
*Students who are performing below grade level will only close the gap with their classmates if they learn **FASTER** than other students.*

***More Instruction**  
**Efficient Instruction**  
**More Practice***



# Reading difficulty and disability

- *Is variation on normal development* (like high blood pressure or obesity, not the flu or cancer)
- Is caused and influenced by several different factors



← Ease of Learning to Read (*Talent*) →

**The typical school approach to students with reading difficulties assumes that the problem is “within the student” and that this is a finite condition.**



# Reading Disability

- By far the most common type is **dyslexia**
  - **Primary characteristic:** Poor ability to read words, especially when presented in lists
  - **Primary underlying cause:** Poor phonemic awareness (ability to hear and manipulate sounds in words), NOT “seeing backwards”
- Less common are disabilities in comprehension and speed of processing text (fluency)

# Comprehension Difficulties

- Many students with comprehension problems also have word reading problems—even in middle and high school.
- Students with adequate word reading but poor reading comprehension also have problems with comprehending oral language

# Causes of Reading Difficulties and Disabilities

- **Genetic:** A Genetic *Predisposition* (about 60% heritable)
- **Environmental:** Economic disadvantage (health care, preschool education opportunities, etc.); print exposure, parental literacy, oral language usage in the home and community, time spent reading to the child; ***not receiving appropriate instruction***
- **Neurological:** Affected by both genetic and environmental influences

Reading failure is caused by the *interaction* between features of instruction, the materials used, and student characteristics.

# Reading Difficulties and the Brain

The way the brain functions when doing reading tasks is different in people with serious reading difficulties (and in children at-risk for serious RD) and normally functioning readers.

But can this be changed?

# Neural Response to Intervention

**Does the pattern of brain activation change in response to intervention?**

- 8 students with severe dyslexia
- 8 week intense phonologically- based intervention (2 hours a day= up to 80 hours of instruction)
- 1:1 in a reading clinic (during the summer)
- 2 hours a day = up to 80 hours of instruction

Simos et al., *Neurology*, 2002

# Demographic Information and Reading Scores

Child	Gender	Age (years/mo)	WJ-III pre (%)	WJ-III post (%)	IQ	Medication
1	M	15	13	55	103	Adderal
2	M	10	2	59	95	Ritalin
3	M	10	2	38	110	Ritalin
4	F	8	3	55	105	Ritalin
5	F	7	2	50	110	Ritalin
6	M	7	18	60	101	—
7	M	11	1	38	98	Ritalin
8	M	17	1	45	102	—

# The Power of ***INSTRUCTION***

- Poverty
- IQ
- Family status
- Language levels
- Genetic predisposition
- Neurological processing patterns



***INSTRUCTION*** MAKES THE ***DIFFERENCE!***



# One-Sentence Reaction

How might our current understanding of reading difficulties and disabilities affect practices in your school or classroom?

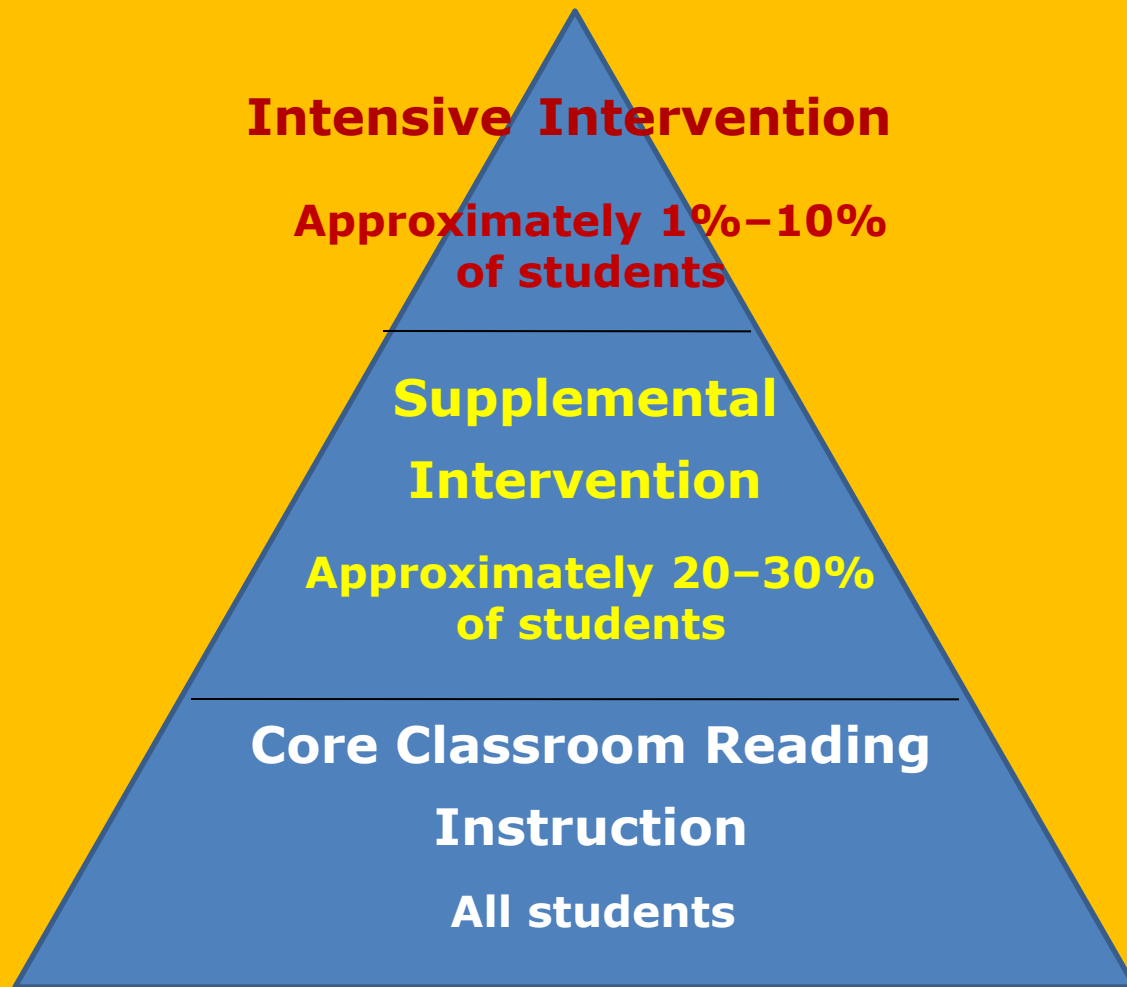
# Core Principles of Response to Intervention (RTI)



“Response to Intervention (RTI) is a comprehensive early detection and prevention strategy that identifies struggling students and assists them before they fall behind. RTI systems combine universal screening and high quality instruction for all students with interventions targeted at struggling students.”

Gersten et al., 2008  
What Works Clearinghouse  
Institute of Education Sciences  
US Department of Education

# A 3-Tier Intervention Model



# Identification of Specific Learning Disabilities

Data documenting how a student responds to evidence-based, quality reading intervention may be used **as a component of the process** of identification of a reading disability.

“It is **critical** that educators view RTI as a school-wide, multi-tiered prevention/ intervention approach that is **aimed at meeting the learning needs of ALL students**, not just as part of the identification process for students with learning disabilities as referenced in IDEA 2004.”

Colorado Dept. of Education Exceptional Student Services  
Unit, 2006

# Core RTI Principles

- We can effectively teach all students.
- Intervene as early as possible.
- Use a multi-tier model of service delivery.
- Screen all students to locate those in need of intervention.
- Monitor student progress to inform instruction.
- Use data to make decisions. Data-based decision-making is **central** to RTI practices.
- When possible, use programs **validated by scientific research**. When research-validated programs are not available, use **evidence-based interventions and instruction**.

What are research-validated programs?



What Is evidence-based instruction?



“Teachers, want, above all, to provide instruction that makes a genuine difference in the lives of their children.”

Lyon, 2000

# Two Acceptable Standards

## Research-Validated Programs

- The programs or teaching approaches themselves were **directly studied**
- Research was of **high quality**
- Program demonstrated **significantly better outcomes than a comparison condition**
- **More than one study** found similar results

## Evidence-Based Programs and Practices

- Programs and teaching approaches **have characteristics that are known to be effective for struggling learners.**
- These characteristics are **derived from converging evidence** from multiple scientific studies.

# Evidence-Based Instruction

- According to the publishers, *everything* is “research-based” or “evidence-based”
- How can we really know what will work best for our students?

***High-  
Quality  
Reading  
Research  
Student  
Data***



***Intuition  
Testimonials  
Poor-Quality  
or Biased  
Studies***

# Evidence-Based Instruction

High-quality scientific research controls for competing explanations for the findings so that you can trust the conclusions

- Random assignment

and/or

- Matched groups with assessments before and after the intervention to “equate the groups”

# Evidence-Based Instruction

- Quality scientific research can indicate that a program is likely to be successful if it is **implemented as it was in the study** (with high fidelity)
- Research will *not* tell you what will work with every single child
- It can tell you what is *more likely* to work for most children

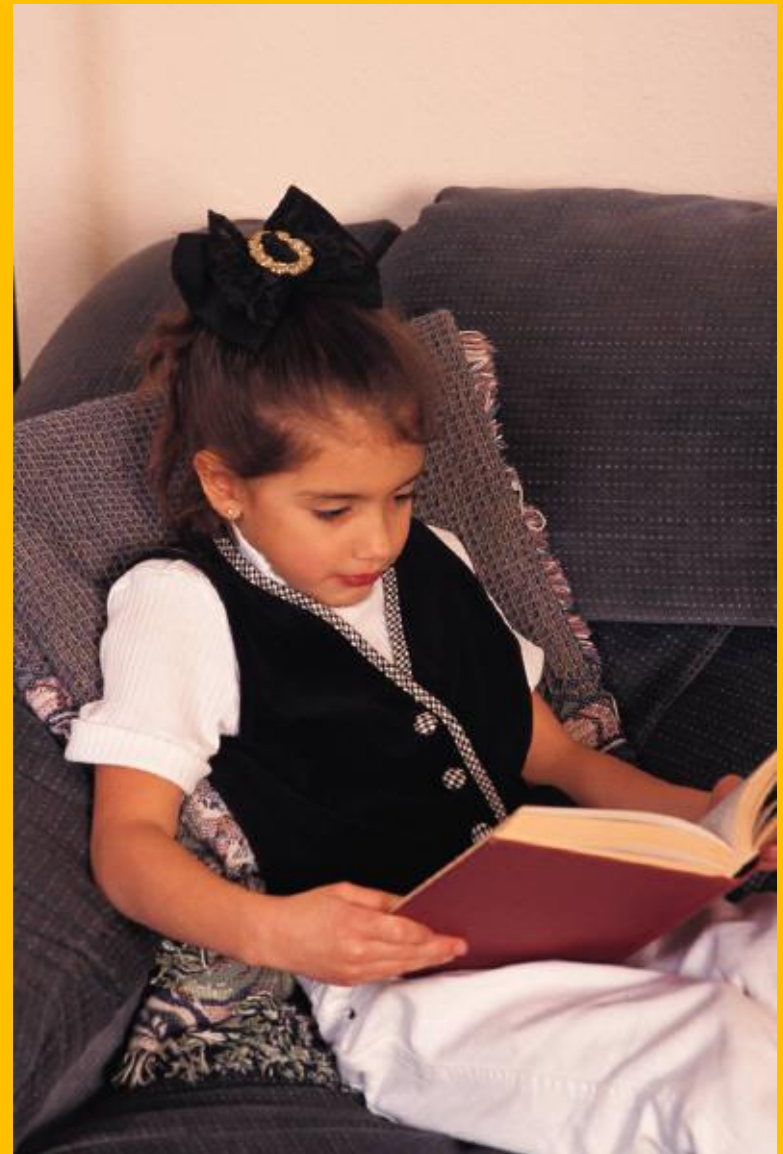
# Evidence-Based Instruction

The use of teaching approaches that are not grounded in quality research and that result in a high percentage of students failing to learn to read **“is analogous to a surgeon choosing to perform a procedure that has a 19% mortality rate over one that has a 10% rate because (1) it is easier to do, (2) the surgeon is trained in it, and (3) the surgeon simply likes it better.”**

Walker, Ramsey, & Gresham, 2004

**The more well-conducted research converges on the same findings, the more we can rely on the findings.**

**Research in early reading conducted over the past 25 years has converged on a set of findings that should inform our selection and implementation of reading programs.**



# Evidence-Based Instruction and Intervention for Primary-Grade Readers

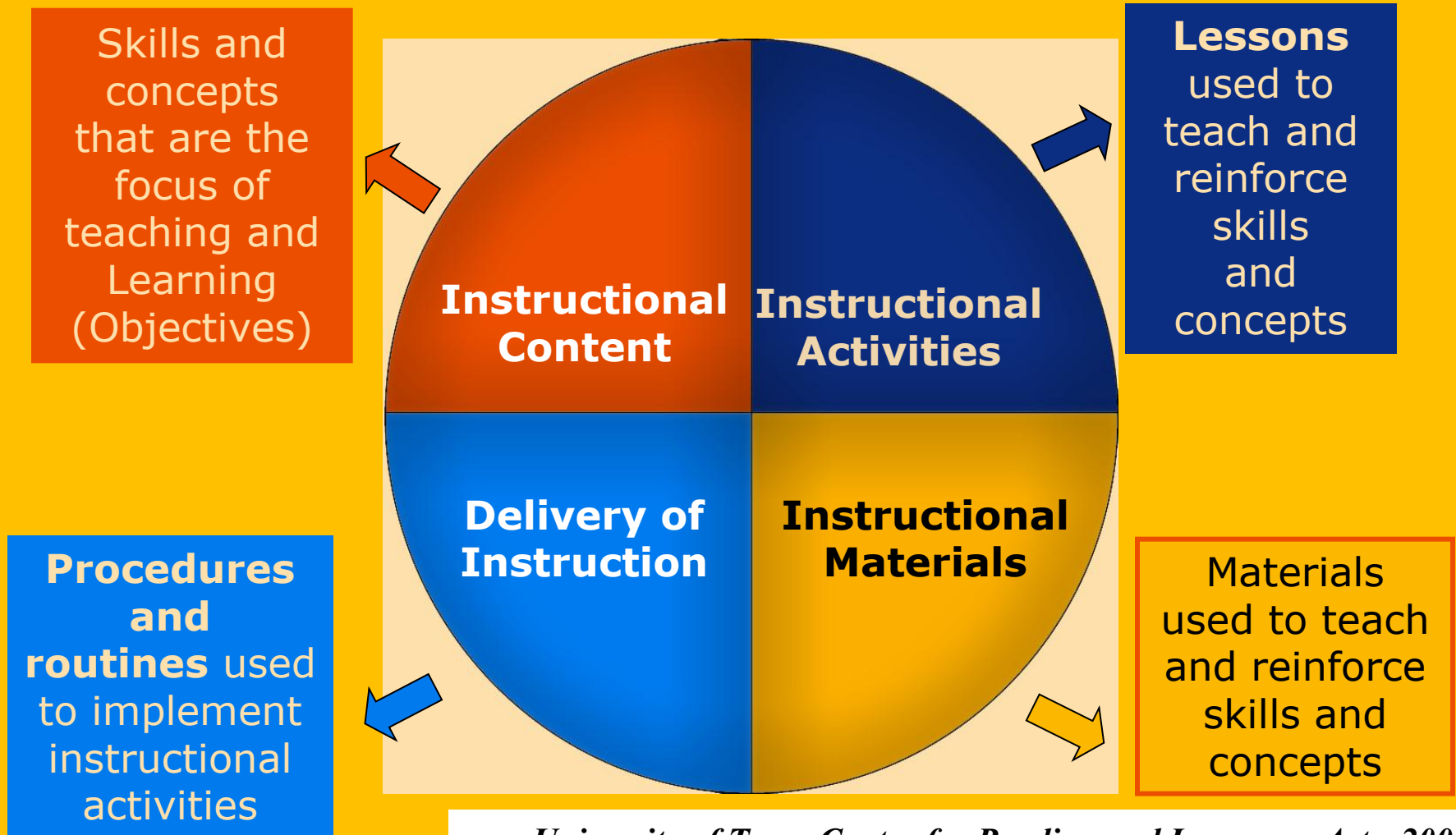




# Tier 1 Classroom Reading Instruction

- Adoption of an evidence-based core program makes quality instruction more likely
- Differentiated Instruction
  - What are the other students doing?
  - Purposeful activities, provide independent practice on objectives that have already been taught
  - Students understand what to do and are successful
- Adaptation of Instruction When Needed

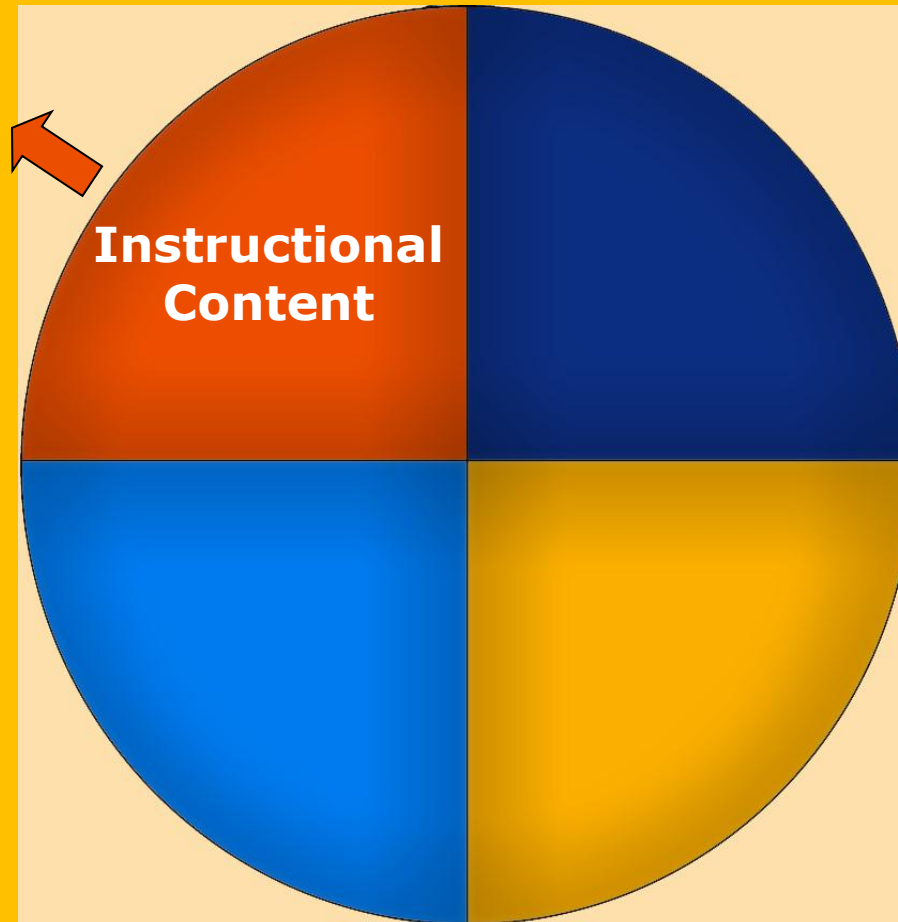
# Adaptation Framework



*University of Texas Center for Reading and Language Arts, 2003  
From Bryant & Bryant, 2003; Bryant, Smith, & Bryant, 2008*

# Adaptation Framework

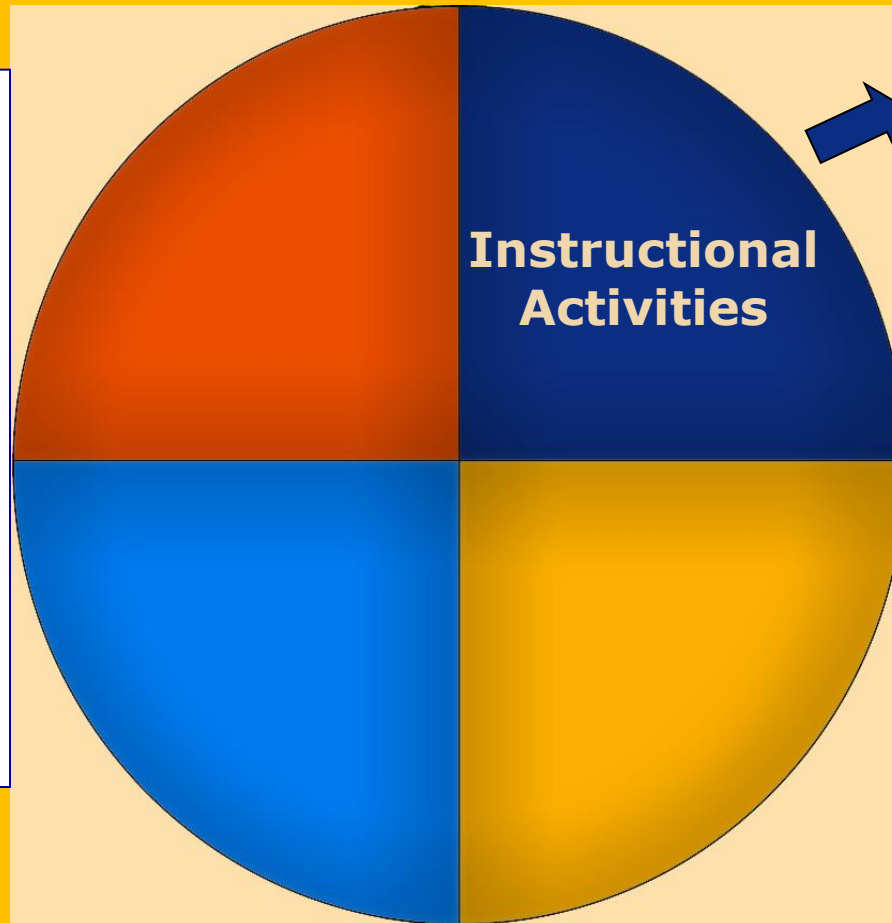
**Skills and concepts that are the focus of teaching and Learning (Objectives)**



- Segment and blend CCVC Words
- Sound out words with r-control vowels
- Read grade-level text at 45 wcpm
- Locate the most important idea in a paragraph

# Adaptation Framework

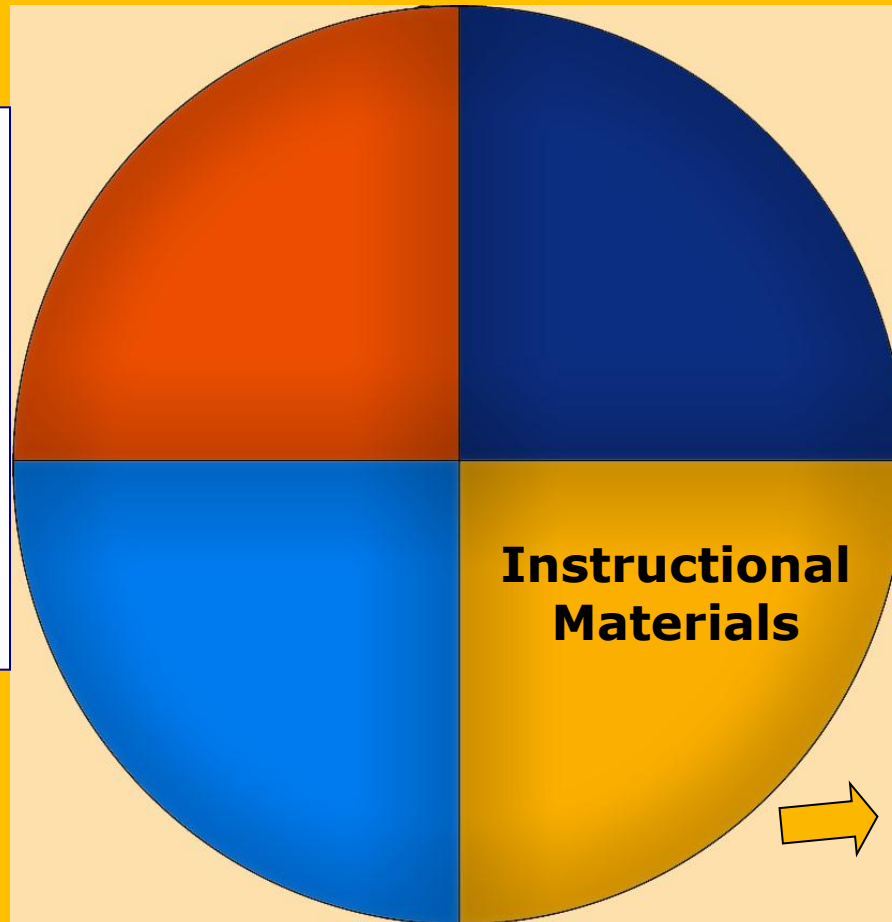
- Introduce the new letter sound
- Provide guided practice
- Provide independent practice



**Lessons  
used to  
teach and  
reinforce  
skills  
and  
concepts**

# Adaptation Framework

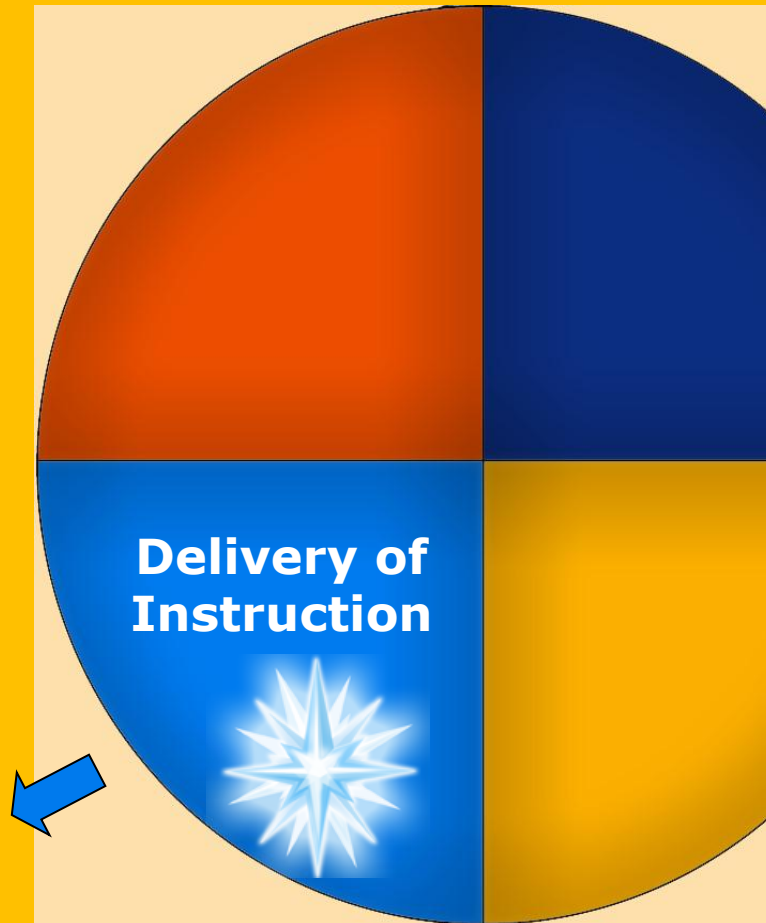
- Instructional-level text
- Decodable text
- Magnetic letters or letter tiles



**Materials  
used to  
teach  
and  
reinforce  
skills and  
concepts**

# Adaptation Framework

**Procedures  
and  
routines  
used  
to  
implement  
instructional  
activities**



- Decrease group size
- Make instruction visible and explicit
- Provide additional practice
- Adjust pacing
- Divide tasks into smaller steps

# Tier 2 Interventions





# Study of First Grade Reading Intervention

(Mathes, Denton, and others, 2005)

- At-risk first graders randomized within schools to Intervention 1, Intervention 2, or Typical School Practice
- Daily 40 min. lessons, Groups of 3-4, about 30 weeks
  - Provided in addition to quality classroom instruction in a “pull-out” format
  - Taught by certified teachers



Research supported by Grant # NSF 9979968;  
Interagency Educational Research Initiative.



# Proactive Intervention\*

- Explicit instruction in synthetic phonics, with emphasis on fluency
- Carefully constructed scope and sequence designed to prevent possible confusions
- Scripted program with time dedicated to practice in phonics skills outside of text reading
- Skills applied in fully decodable text
- Mastery tests



*\*Now SRA Early Interventions in Reading,  
Mathes & Torgesen, 2005*

# Responsive Reading Instruction

- Explicit instruction in synthetic & analogy phonics
- Less time spent practicing letters and words in isolation
- Students apply decoding, fluency, & comprehension skills while reading and writing
- Not scripted; teachers plan lessons based on continuous diagnostic assessment
- Leveled text; not decodable
- Differs from guided reading in that “sounding out” is the primary strategy for identifying unknown words



*Denton & Hocker, 2005*

# Results

- Students in both Proactive and Responsive groups performed significantly better than at-risk students in the same schools who did not receive the researcher-provided interventions in phonological awareness, word reading (timed and untimed), spelling, and oral reading fluency
- Two interventions had very similar results; Proactive did better in non-word reading (phonemic decoding)

## Growth in Word Reading by Intervention Group



# What percentage of children did **not** respond adequately to intervention?

(Woodcock Basic Reading Cluster < 30<sup>th</sup> percentile)

## **Tier 1 Only:**

16% (about 3% of school 1<sup>st</sup> grade population)

## **Tiers 1 and 2:**

- **Proactive:**  $1/80 = < 1\%$  (about .2% of school population)
- **Responsive:**  $6/83 = 7\%$  (about 1.5% of school population)

**Mathes, Denton, Fletcher, Anthony, Francis, &  
Schatschneider (2005)**

# Implications

- There is **not one “magic program”** to teach students with reading difficulties
- Various reading programs have produced good results
- They put different demands on teacher time and expertise (e.g., scripted, unscripted).
- They have some **common characteristics**

# Essential Characteristics Common to Successful Interventions

- *Integrated* instruction in key areas of reading, targeting students' needs: phonemic awareness, phonics, fluency, vocabulary, comprehension
- Explicit instruction
- Systematic instruction
- Small-group instruction with active engagement and little “down time”
- Extended opportunities to practice with feedback
- Opportunities to apply skills and strategies while reading connected text with teacher feedback
- Use of data to provide targeted instruction

# Explicit Instruction

- Clearly explain or show students what you want them to learn
- Students do not have to infer what they should learn
- *Students who are easily confused are more likely to be successful.*



# Explicit Instruction

- Purposeful planning with a clear objective
- Model and teach clearly
- Guided practice with clear feedback, specific praise, and scaffolding
- Independent practice
- Cumulative practice
- Continuous assessment
- Reteach as necessary

# Basic Instructional Format

- ✓ **Model and teach (“I do”)**  
Show students the correct way.
- ✓ **Guided practice (“We do”)**  
Students do it with teacher support.
- ✓ **Independent practice (“You do”)**  
Students practice alone.
- ✓ **Cumulative practice**  
Students practice new items along with items already learned.



# Systematic Instruction

- Based on a scope and sequence
- Thoughtful *plan* and *purpose* for instruction
- Sequence of instruction ensures key skills are mastered
- Easy to hard
- Separate possible confusions
- Frequent reviews

# Active Student Involvement

- Little “Teacher Talk”
- Quick pacing
- Little “down time”
- May include manipulatives
- Daily reading practice scaffolded by the teacher



# The Importance of Practice

- Provide many opportunities for **monitored practice**.
- Students need extended practice **over time**.
- What is practiced ***becomes a habit***.
- ***Caution: Don't let students practice their mistakes!***



# Feedback

- Students need to know when they've made mistakes.
- Don't let students practice their mistakes.
- Errors are opportunities for teaching.
- Provide feedback in a **neutral** tone
- Do not underestimate the power of **specific, honest** positive feedback

# Meaningful Reading and Writing Practice (Guided Application)

- Students apply skills and strategies in reading and writing.
- Teacher (or trained tutor) provides scaffolding, prompting and both corrective and positive feedback.
- At-risk students do not “automatically” apply the skills they have learned



See Handout 1

# Popular Strategies of Struggling Readers When they Encounter Difficult Words

- Guessing words
- Looking at pictures instead of print
- Skipping words
- Waiting to be told words
- Mumbling



# A Strategy for Reading Unknown Words

## Three-Step Strategy



Look for parts you know.



Sound it out.



Check it.

Denton & Hocker, 2006

# Scaffolds

## Look for parts you know.

- Do you see any letters you know?
- What sound does this letter make?
- Do you see any parts you know?

## Sound it out.

- Say it slowly.
- Can you sound out this part?
- What's the first sound? Now sound out the next part...

## Check it.

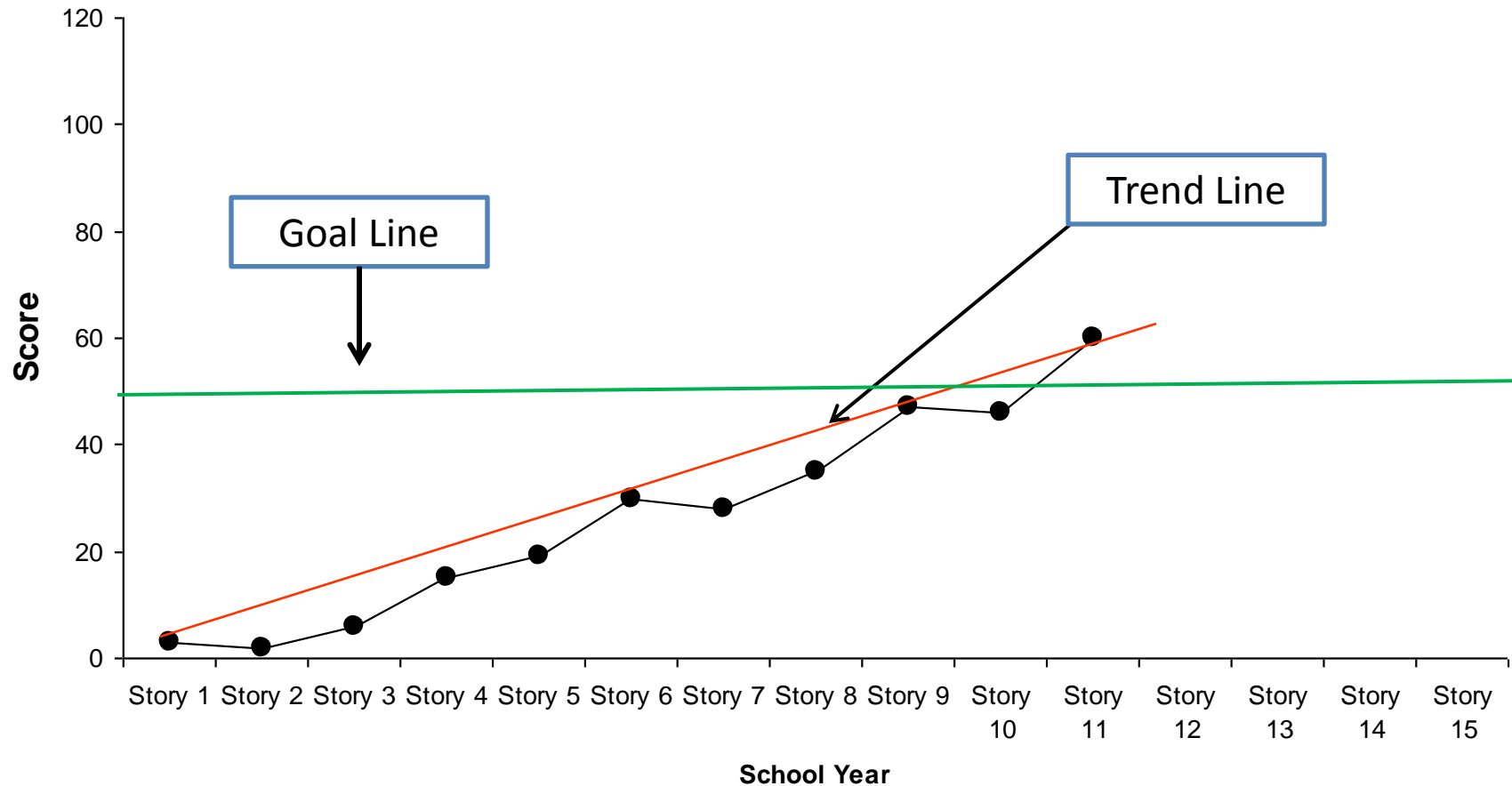
- Did that make sense?
- Did that sound right?

# Data-Based Targeted Instruction

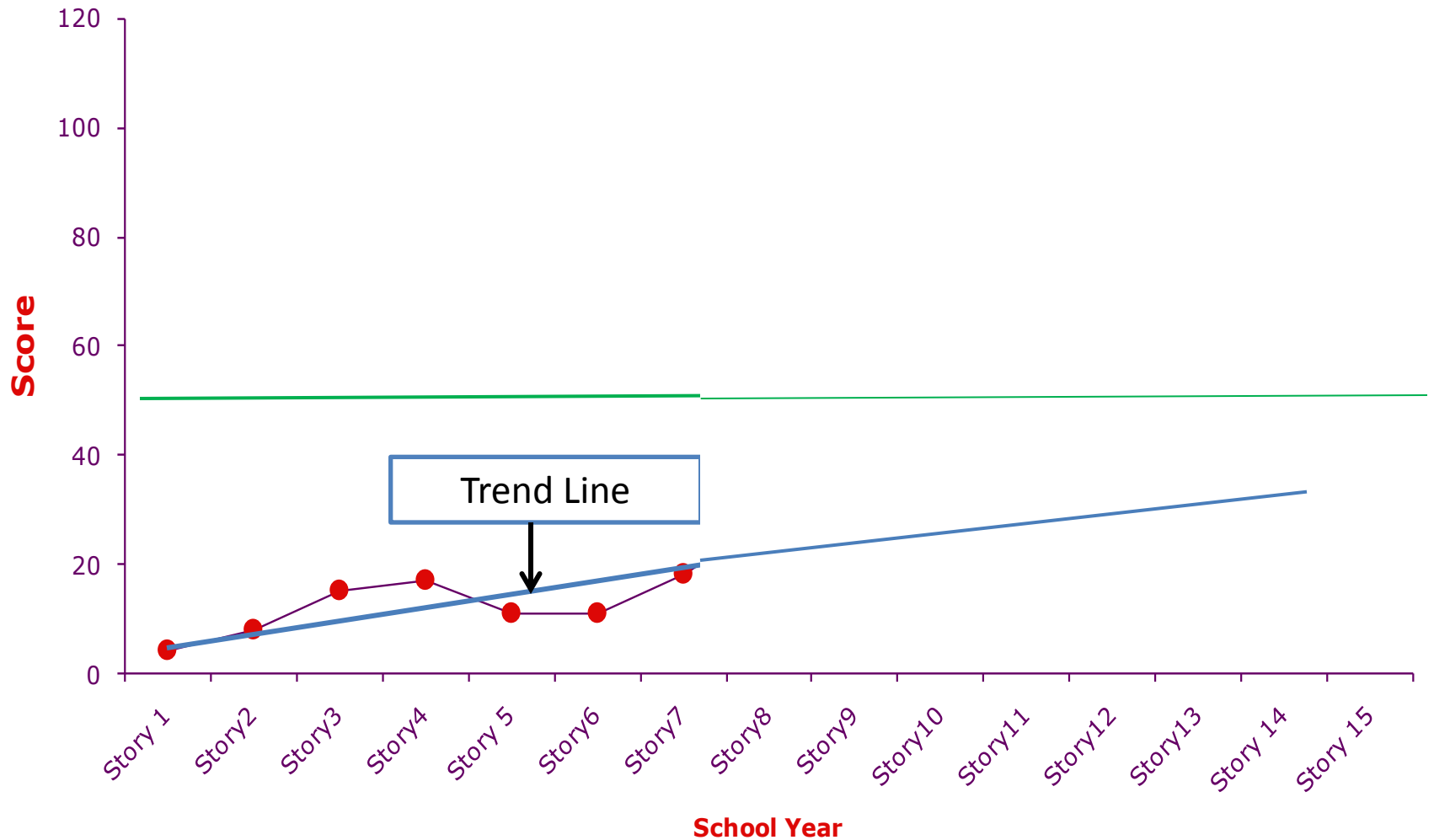
- Meet students where they are; go from the *known* to the unknown.
- Use **progress monitoring** data to inform instruction.
- Plan lessons based on **diagnostic assessments**.
- When instruction is not appropriate for the student, behavior problems are common



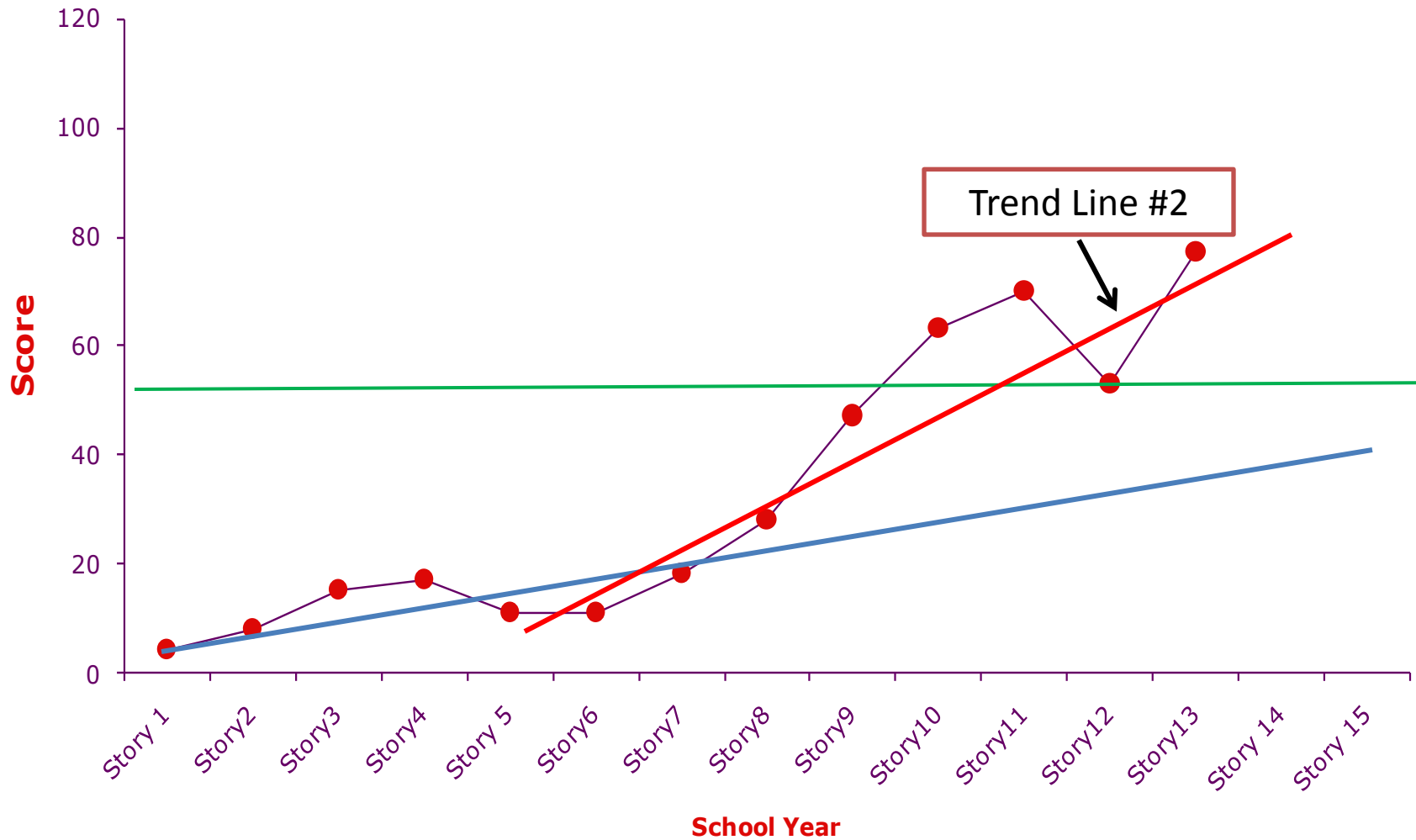
# Growth in Oral Reading Fluency for Imari



# Growth in Oral Reading Fluency for James



# Growth in Oral Reading Fluency for James



# Selecting Tier 2 Programs



**Select a “Research-Validated” program**

*or*

**Select a program  
with these key  
evidence-based  
characteristics**

See Handout 2

# Adapting Instruction Using Evidence-Based Practices

- Imagine that a first grade teacher has taught a lesson on sounding out silent e words
- One group of students impulsively guesses words rather than using sounding-out strategies
- How might the teacher adapt instruction for this group in a small group lesson?
- Think about all 4 types of adaptations.

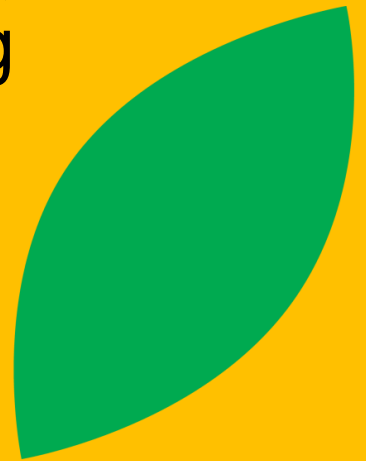


# Tier 3: Intensive Intervention



# Characteristics of Many Students in Tier 3

- Difficulties **reading single words**
- **Oral language difficulties** (vocabulary, word retrieval)
- Poorly-developed **background knowledge**
- Difficulties with **verbal working memory**
- Impaired **executive functions** (attention, purposeful use and regulation of reading strategies; identifying what is important; self-monitoring)
- Low **self-esteem**
- Low **motivation to read**
- **Social and behavioral difficulties**



# A Complex Picture

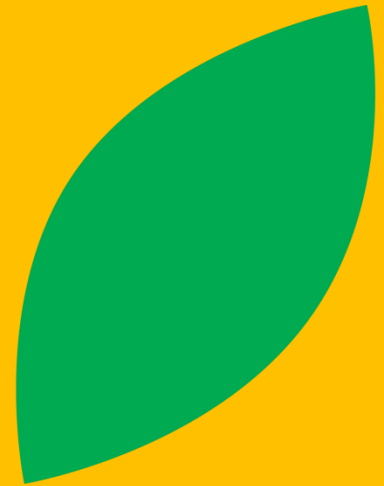
- **Many students with RD also have other conditions that affect learning**
- Anxiety, behavior disorders, etc.
- **Attention problems**
  - About 25% of children with ADHD also have RD, and about 25% of children with RD also have ADHD
  - It is *Inattention*, not hyperactivity, that is related to RD
  - Children with both disorders are more severely impaired and resistant to remediation
  - A study in progress is evaluating treatments for children with both disorders: I-CARD (Interventions for Children with Attention and Reading Disorders)

What kind of  
intervention is  
effective for  
students who don't  
respond adequately  
to effective,  
relatively intensive  
Tier 1 and 2?



# What Does Intensive Reading Intervention Mean? Think about “Intensive Care”

- **Very small groups**
- **Increased dosage**
- **Appropriate curriculum**
- **Powerful instruction**
- **Constant monitoring**
- **A sense of urgency**
- **Collaboration among teachers**



# Three Tiers of Instruction in the Primary Grades: One Example with Less Intensive Tier 2 Intervention

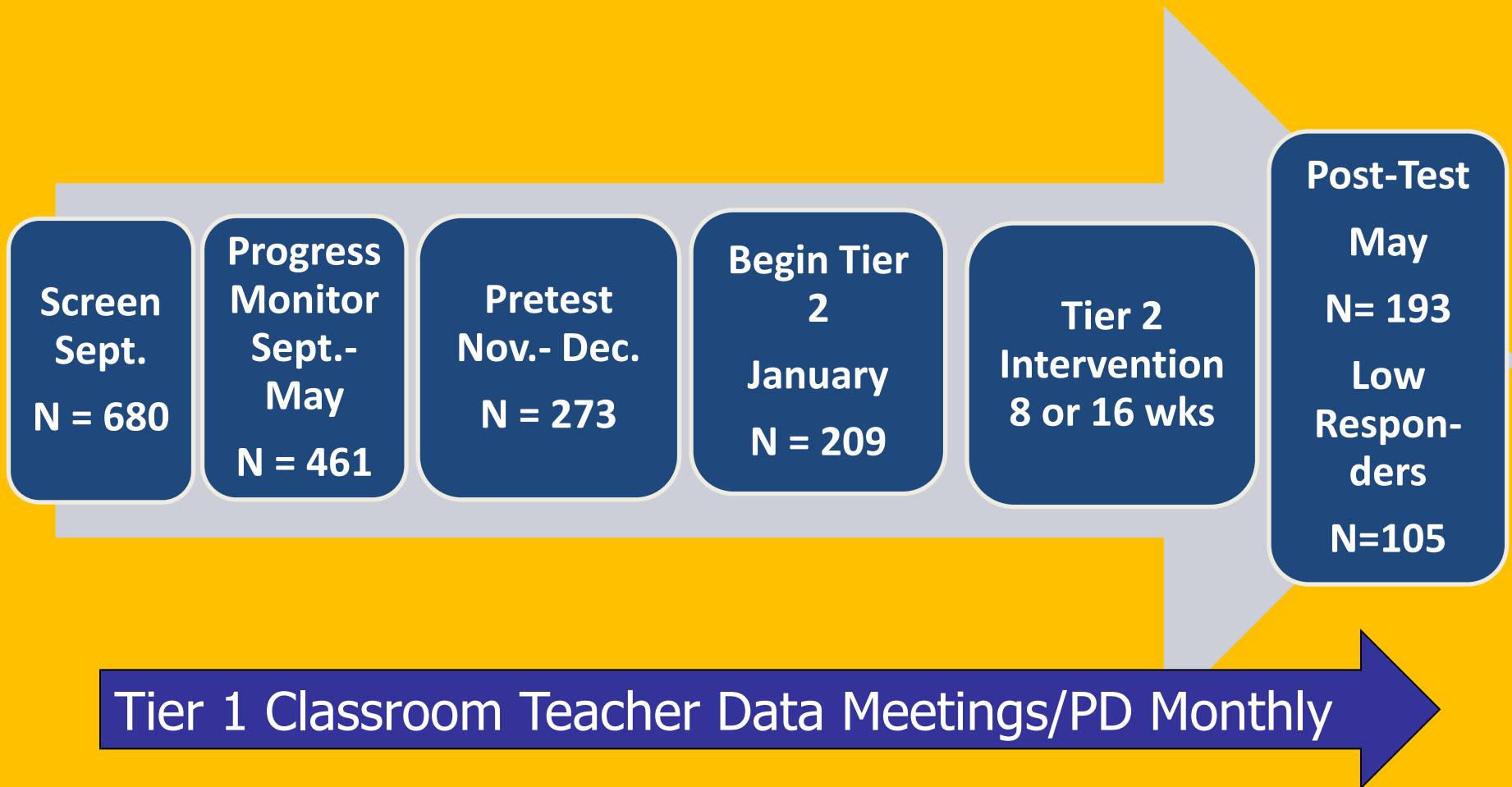
Denton, Cirino, Barth, Romain, Vaughn, Wexler, Francis,  
& Fletcher (2011)

Denton, et al., manuscript under review

# First Grade Study

- Compared outcomes for Tier 1 intervention Plus Tier 2 intervention provided for 1 semester on 3 schedules
- 9 schools in 2 school districts
- Identified instructional characteristics that impacted student outcomes

# Timeline: First Grade Year





# Supporting Tier 1

- Provided **graphs of progress monitoring data**
- Regular **data meetings** with classroom teachers: examined progress monitoring data for their 3 lowest students (Tier 3 or Typical Practice)
- Provided Brief PD on **adapting instruction in Tier 1** to increase use of evidence-based practices
- In-class **coaching** on request

# Tier 2 Intervention

- First Grade Tier 2: Screened students in the Fall and monitored progress for 8 weeks, then selected Tier 2 students
- Provided Tier 2 “pull-out” intervention beginning in January on three schedules for 8-16 weeks (30 min. lessons)
- Highly Standardized (scripted) intervention provided by paraprofessionals
- **Results were not as strong as in previous studies with more intensive Tier 2 intervention**

# Tier 3 Timeline

**Randomized to Tier 3  
Intervention or Typical  
School Practice**

**N = 103**

**Two Schools  
Dropped Out,  
Students Moved,  
etc.**

**N = 72**

**Tier 3 Intervention  
Oct.-April**

**N = 47**

**Typical Practice**

**N = 25**

# Study of Individualized Tier 3 Intervention

- Identified those with inadequate response to Tiers 1 + 2 in word reading and fluency
- Randomly assigned low responders to the research intervention or typical school practice
- Provided “pull-out” intervention to treatment group in groups of 2-4, 45 min., 4 days per week; tutors were hired and supervised by the researchers

Denton, et al., manuscript under review

# Study of Individualized Tier 3 Intervention

- Groups of 2-3 with certified teachers or experienced reading clinicians, hired, supervised, and coached by the researchers
- 45 min. lessons 4 days/week, about 26 weeks
- **Individualized within a framework**
  - Planning based on **frequent diagnostic assessment**
  - Each lesson included word study, fluency, text reading with integrated comprehension instruction, and writing in response to text (amounts of time for each varied)
  - **Teachers determined instructional objectives and selected activities from a “menu”** (Responsive Reading Instruction + more advanced activities)

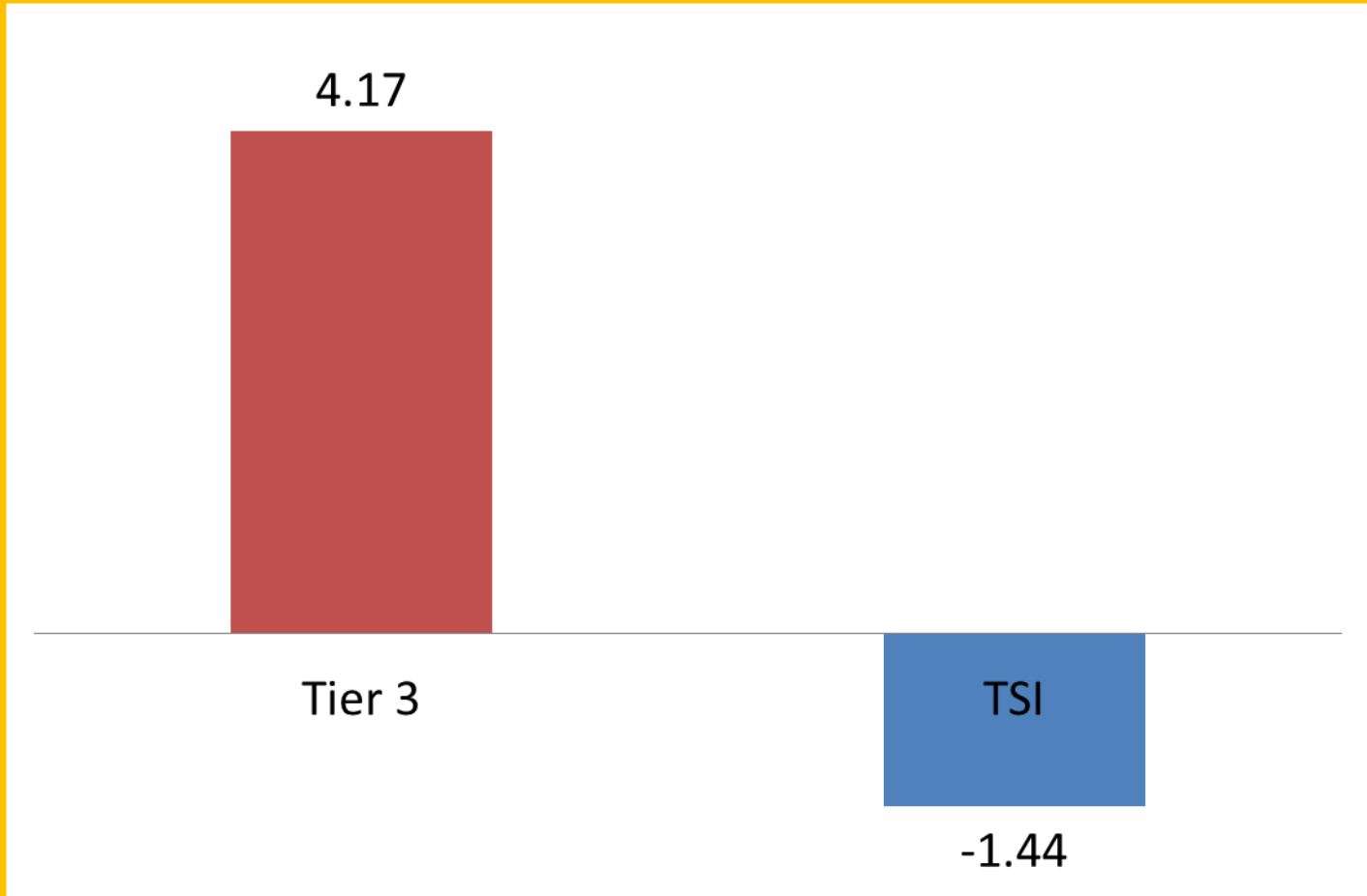
## MENU OF ACTIVITIES FOR INDIVIDUALIZED TIER 3 INTERVENTION

<b>Word Work</b>	<p><b>Phonological Awareness</b></p> <ul style="list-style-type: none"> <li>• Stretching Words (phoneme segmentation)</li> <li>• Mystery Word Game (phoneme blending)</li> <li>• Elkonin Sound Boxes/no print</li> </ul> <p><b>Letter-Sounds and Letter Combinations</b></p> <ul style="list-style-type: none"> <li>• Teaching Letter-Sounds</li> <li>• Teaching Letter Combinations</li> <li>• Pick-Up-the-Letter Game</li> <li>• Vowel Sound Game (medial vowel sound identification)</li> <li>• Teaching Letter Formation</li> </ul> <p><b>Sounding Out and Spelling Words</b></p> <ul style="list-style-type: none"> <li>• Teaching Sounding Out</li> <li>• Elkonin Sound Boxes with Print</li> <li>• Point Game (sounding out practice)</li> <li>• Silly Word Game (nonword reading)</li> </ul>	<ul style="list-style-type: none"> <li>• Teaching the Silent e Rule</li> <li>• Listen and Spell (mapping sound to print)</li> <li>• Word Linking</li> <li>• Word Pattern Charts (poster with a list of words with a sound-spelling pattern; e.g., oa, ay, ow)</li> <li>• Word Sorts</li> <li>• Sound Box Spelling</li> <li>• Reading Word Lists</li> </ul> <p><b>High-Frequency Words</b></p> <ul style="list-style-type: none"> <li>• Teaching High-Frequency Words</li> <li>• Beat the Teacher Game (timed flash card game to promote automaticity)</li> <li>• Writing High-Frequency Words</li> </ul> <p><b>Multisyllabic Words</b></p> <ul style="list-style-type: none"> <li>• Reading Multisyllabic Words</li> <li>• Writing Multisyllabic Words</li> <li>• Reading Closed Syllables</li> <li>• Teaching the Schwa Sound</li> <li>• Flexing Words</li> <li>• Reading Open Syllables</li> </ul>
<b>Fluency</b>	<ul style="list-style-type: none"> <li>• Repeated Reading with a Model</li> <li>• Partner Reading</li> <li>• Reading Phrases</li> <li>• Oral Reading with Word Instruction</li> </ul>	<ul style="list-style-type: none"> <li>• Beat the Clock (timed practice)</li> <li>• Whisper Reading (independent)</li> <li>• Read Naturally Procedure</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Anecdotal Records</li> <li>• Assessment of Reading Accuracy</li> <li>• Benchmark Assessment (DRA)</li> <li>• Letter-Sound Assessment</li> <li>• High-Frequency Words</li> <li>• Oral Reading Fluency (RRI text)</li> </ul>	<ul style="list-style-type: none"> <li>• Oral Reading Fluency (DIBELS)</li> <li>• Word List Assessment</li> <li>• Quick Phonics Screener</li> <li>• Read Naturally Placement Test</li> <li>• Primary Spelling Inventory</li> </ul>

# Results

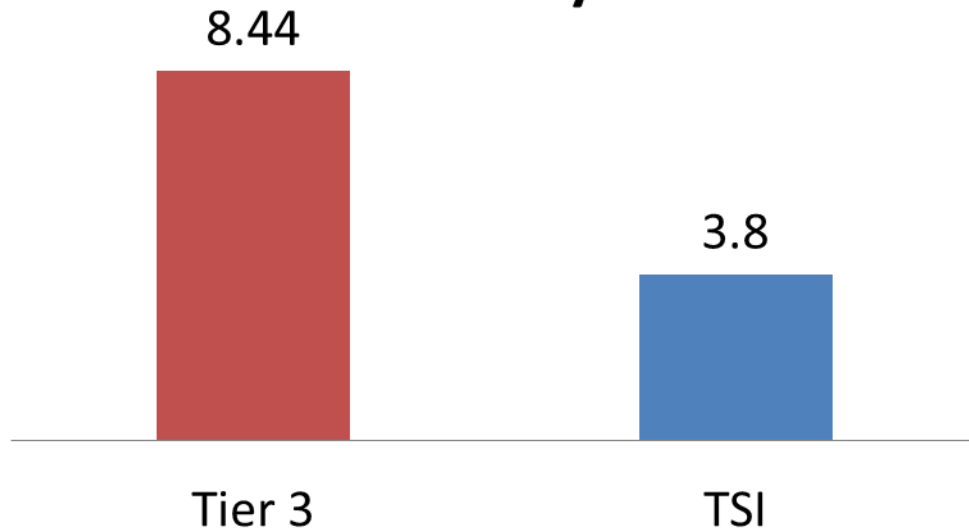
- Tier 3 Intervention group had better gains than Typical Practice group on all measures
- Statistically Significant in Word Reading and Phonemic Decoding, Word Reading Fluency, one measure of reading comprehension
- “Practically important” effects in Decoding Fluency, Reading Comprehension in extended text
- No meaningful differences in oral reading fluency

# Word Reading and Decoding Standard Score Change

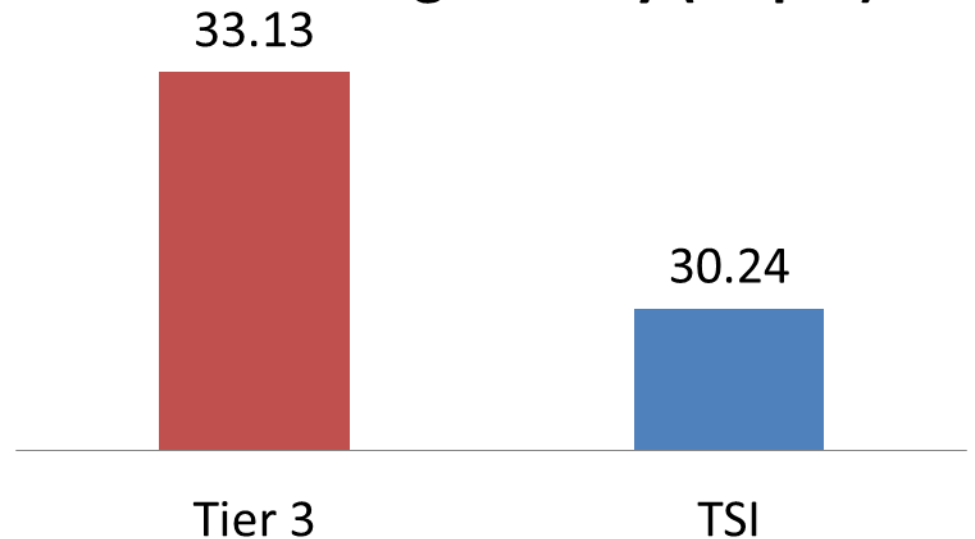




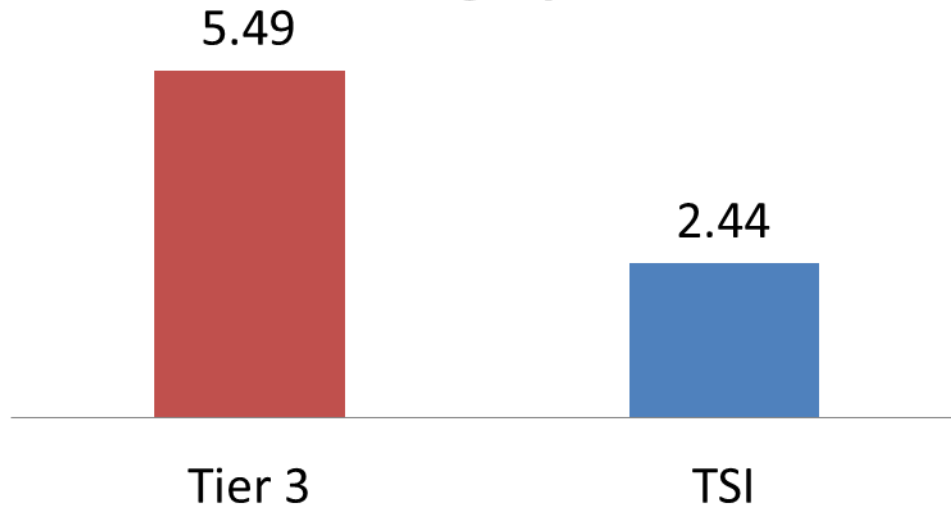
## Word Reading and Decoding Fluency



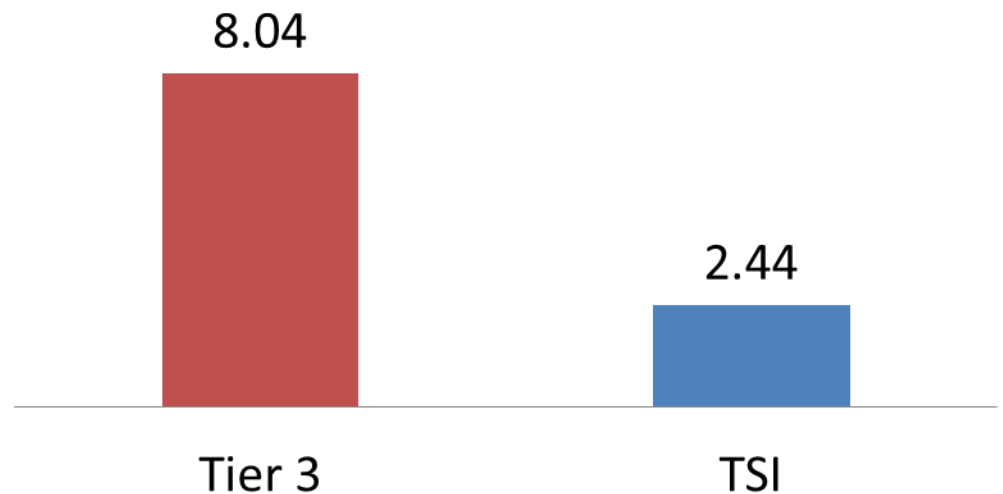
## Oral Reading Fluency (wcpm)



## Comprehension of Paragraphs



## Comprehension of Extended Text (Percentiles Gained)



# But...

- No meaningful differences in oral reading fluency
- Most students remained impaired in fluency and comprehension
- Students with low RTI in Tier 3 are severely impaired in language domains
- They will probably need an **extended period of practice with feedback** as well as **effective vocabulary instruction** and **activities designed to build background knowledge**

# Implications

- Less intensive Tier 2 intervention was not as effective as more intensive interventions
- Tier 3 intervention that was individualized within a framework was significantly more effective than typical school practice on multiple measures
- Oral reading fluency is consistently more difficult to impact; provide extended reading practice with feedback
- Comprehension strategy instruction is probably not enough for very impaired readers: Build vocabulary and background knowledge

# How might this research inform your implementation of RTI?

Identify one idea to take back to your colleagues related to:

- Tier 1
- Tier 2
- Tier 3

# Implementing Interventions: Practical Questions



# **Tier 2 & 3 Implementation: What Can We Learn from Research?**

- When should Tier 2 start?
- Intervention “dosage”
- Group size
- Interventionists and location
- How should we evaluate response?

# When should Tier 2 start?

- Second half of kindergarten?
- Beginning of Grade 1?
- Middle of Grade 1?
- There are tradeoffs
  - Start early: Probably many “false positives”
  - Start later: Waste precious time for students who really need intervention
  - May be a matter of resources and priorities



# Tier 2 Intervention Dosage: Kindergarten

Al Otaiba, Schatschneider, & Silverman, 2005

- Randomly assigned students to receive the same small-group intervention 2 or 4 times per week or to a control condition
- 4 X per week performed significantly better than controls in word reading and comprehension, with large effect sizes
- 2 X per week performed significantly better than controls only on one phonemic awareness measure

# Time in Tier 2 Intervention (Grade 1)

Denton & Mathes, 2003

- Provided intervention to 163 first graders at-risk for reading difficulties
- Intervention provided daily for 40 minutes over 30 weeks in groups of 3-4 students
- Monitored ORF every 3 weeks
- Did not exit students from intervention but analyzed the percentage of students that met benchmarks at different points

# Time in Tier 2 Intervention (Grade 1)

Denton & Mathes, 2003

Percentage of Students Meeting Benchmark of 35 WCPM\* at Each Assessment Point

Assessment Points	Proactive Intervention (n = 80)		Responsive Intervention (n = 83)	
		Cumulative		Cumulative
9 weeks	2 %		0 %	
21 weeks	35 %	37%	46 %	46%
30 weeks	45 %	82%	31 %	77%
Never Met Criteria	18 %		23 %	

\*35 WCPM = 30<sup>th</sup> percentile for first grade, according to Good et al., 2002

# Study of Less Intensive Tier 2

Denton et al., 2011

- 193 at-risk students randomly assigned to 3 conditions; all received same intervention
  - Concentrated: 8 weeks, 4 times per week (32 sessions)
  - Extended: 16 weeks, 4 times per week (64 sessions)
  - Distributed: 16 weeks, 2 times per week (32 sessions)
- Provided *in addition to* Tier 1

# Results

- No significant differences between groups
- Fewer students met standards for adequate response than in our previous studies

STUDY	SCHEDULE	OTHER VARIABLES	Adequate RTI Treatment Group	Adequate RTI Typical Practice Comparison
Mathes et al., 2005	40 min. 5 days/wk 30 weeks	Groups of 3-4 Cert. Teachers <i>Responsive Reading</i>	<b>93 %</b>	<b>84 %</b> (Few got intervention)
Mathes et al., 2005	40 min. 5 days/wk 30 weeks	Groups of 3-4 Cert. Teachers <i>Proactive Reading (EIR)</i>	<b>99 %</b>	<b>84 %</b> (Few got intervention)
Denton et al., 2010	40 min. 5 days/wk 24 weeks	Groups of 3-4 Cert. Teachers <i>Responsive Reading</i>	<b>91%</b>	<b>79%</b>
Denton et al., 2011	30 min. 2-4 days/wk 8-16 weeks	Groups of 3 Paraprofessionals <i>Read Well</i>	<b>74-81%</b>	N/A

# Time in Tier 2 Intervention:

## Vaughn & Linan-Thompson, 2003

- Provided intervention to 45 2<sup>nd</sup> grade struggling readers, outside of regular classroom, groups of 3, 30 min. daily
- Established criteria based on oral reading fluency for exiting intervention
- Exited students who met criteria after 10, 20, and 30 weeks
- Examined continued growth without intervention (defined as gaining at least 1 wcpm per week after exit)

# Time in Tier 2 Intervention (Grade 2)

Vaughn et al., 2003

Assessment Points	% Meeting Exit Criteria	Baseline Mean ORF (sd)	Number Making Continued Growth After Exit
10 weeks	22%	32.5 (7.18)	<u>After 10 more weeks</u> : All 10 <u>After 20 weeks</u> : 7 of 10; 2 made minimal gains and 1 declined
20 weeks	31%	19.80 (9.99)	8 of 14; 2 made minimal gains and 3 declined
30 weeks	22%	13.40 (5.48)	
Never Met Criteria	24%	10.55 (4.76)	



# *Suggested* Intervention “Dosage”

TIER	LENGTH	DURATION
1	60-90 minutes uninterrupted <i>instruction</i> every day	All school year
2	30-40 minutes 4-5 days per week	Usually at least 20 weeks
3	50-60 minutes (or more?) every day	All school year, possibly over several years

If students meet benchmarks, you may consider an earlier exit, but provide regular “booster sessions”.

# Group Size

## Tier 2

- Based on direct research
  - 1:3 has comparable outcomes to 1:1 for most students
  - 1:3 is better than 1:10
- Based on effective interventions: 1:3 to 1:5

## Tier 3

- Based on effective interventions: 1:2 or 1:1 (possibly 1:3)

Elbaum, Vaughn, Hughes & Moody, 2000;  
Vaughn et al., 2003

# Who Can Provide Intervention?

## Tier 2

- Reading Specialists
- Paraprofessionals and other teachers, under certain conditions
- Classroom Teachers, under certain conditions
  - Consider scheduling and other demands
  - Cross-classroom collaboration?

Tier 3: Highly qualified and well-trained teachers with coaching support

# Paraprofessionals and Tutors

- Tier 2 intervention provided by non-certified paraprofessionals or tutors can result in improved outcomes for students (demonstrated in several studies)
- Important considerations
  - Carefully selected tutors (must have adequate PA, be able to learn letter-sounds, etc.)
  - Well-trained
  - **Supervised and *coached closely by a well-qualified teacher***
  - **Implement a well-described program (potentially scripted)**
  - **Keep group sizes small (e.g., 1-3 students)**

# How should response be evaluated?

- Types of measures
  - Progress monitoring (repeated measures)
    - Slope (rate of growth) vs. ending level
  - Final benchmark
  - Combinations
- Reading domains
  - Word reading/decoding
  - Fluency
  - Comprehension
- Actual benchmarks or cut-points: 20<sup>th</sup> %ile?  
25<sup>th</sup>? 30<sup>th</sup>? 40 wcpm?

# Approaches to Evaluation of RTI

Approaches that differ on these dimensions are **likely to identify different students as adequate and inadequate responders**, and there may be little or no overlap in the identified groups!

Barth et al., 2008; D. Fuchs et al., 2008

# An Evaluation of Criteria for Grade 1 Reading: Which approaches best predicted status at the end of Grade 2?

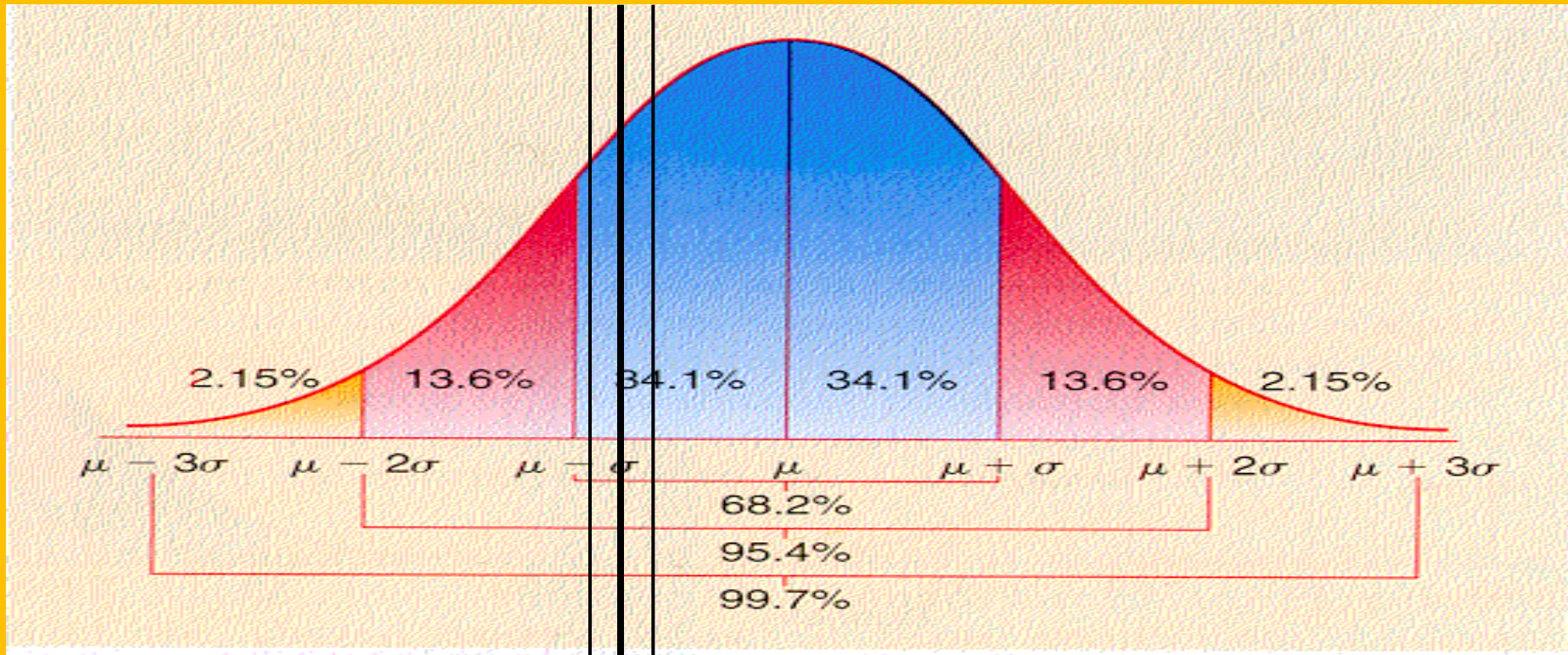
- Low *pre-test* scores on a test of word reading fluency
- Final benchmark of the 20<sup>th</sup> % ile on the *Test of Word Reading Efficiency* Sight Word Efficiency subtest
- Word Identification Fluency slope at least 1 *SD* below a normative sample

# Other Considerations

- **Final benchmarks** of performance at the 20<sup>th</sup> or 30<sup>th</sup> %ile on standardized tests of **word reading or word reading fluency** have been used in research
- **Fewer students will meet fluency** benchmarks than word reading benchmarks, but fluency is closely related to comprehension in the primary grades.
- **Multiple measures are better** than a single measure
  - All tests contain error
  - Any time a single cut-score is applied to make decisions, there will be errors on both sides of the cut-off



# Error



If you gave the same test to the same student tomorrow, the score would be a little different.

# Other Considerations

- There are **mixed findings on the use of slope** (rate of growth) on repeated fluency measures (Schatschneider, Wagner, & Crawford, (2008).
- Oral reading fluency passages are not “truly” equivalent in difficulty, introducing error into calculations of slope (Francis et al., 2008)
- **Definitely** use progress monitoring data to inform instruction.
- **Comprehension standards may make more sense beyond Grade 1**

# Challenges: Implementing an RTI Model

There is never enough

*TIME*

There is never enough

*MONEY*

There are never enough

*TRAINED PERSONNEL*



The numbers of children who still have reading difficulties after intervention is related to the *nature, quality, quantity* and *intensity of instruction*.

## The Power of Instruction!



What is the biggest challenge to RTI implementation in your school?

What is ONE idea for overcoming that challenge?

# RTI in Middle School







Learning for SUCCESS  
[www.texasldcenter.org](http://www.texasldcenter.org)

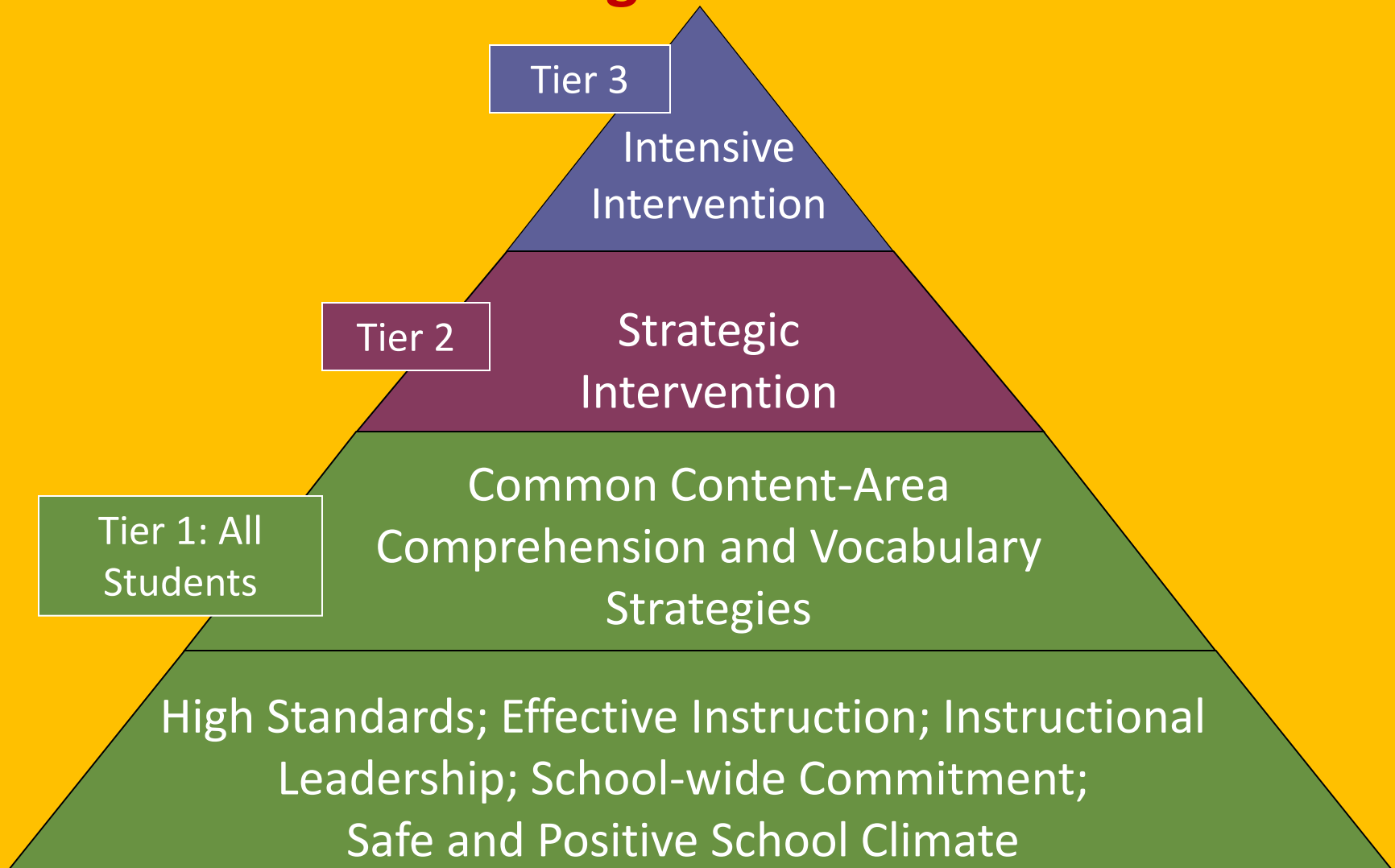
Jack Fletcher and David Francis,  
University of Houston  
Sharon Vaughn, University of Texas at  
Austin

Funded by the National Institute of Child  
Health and Human Development (NICHD).  
**Award # P50 HD052117-01**

The Texas Center for  
Learning Disabilities  
(TCLD) investigates  
the classification, early  
intervention, and  
remediation of learning  
disabilities.



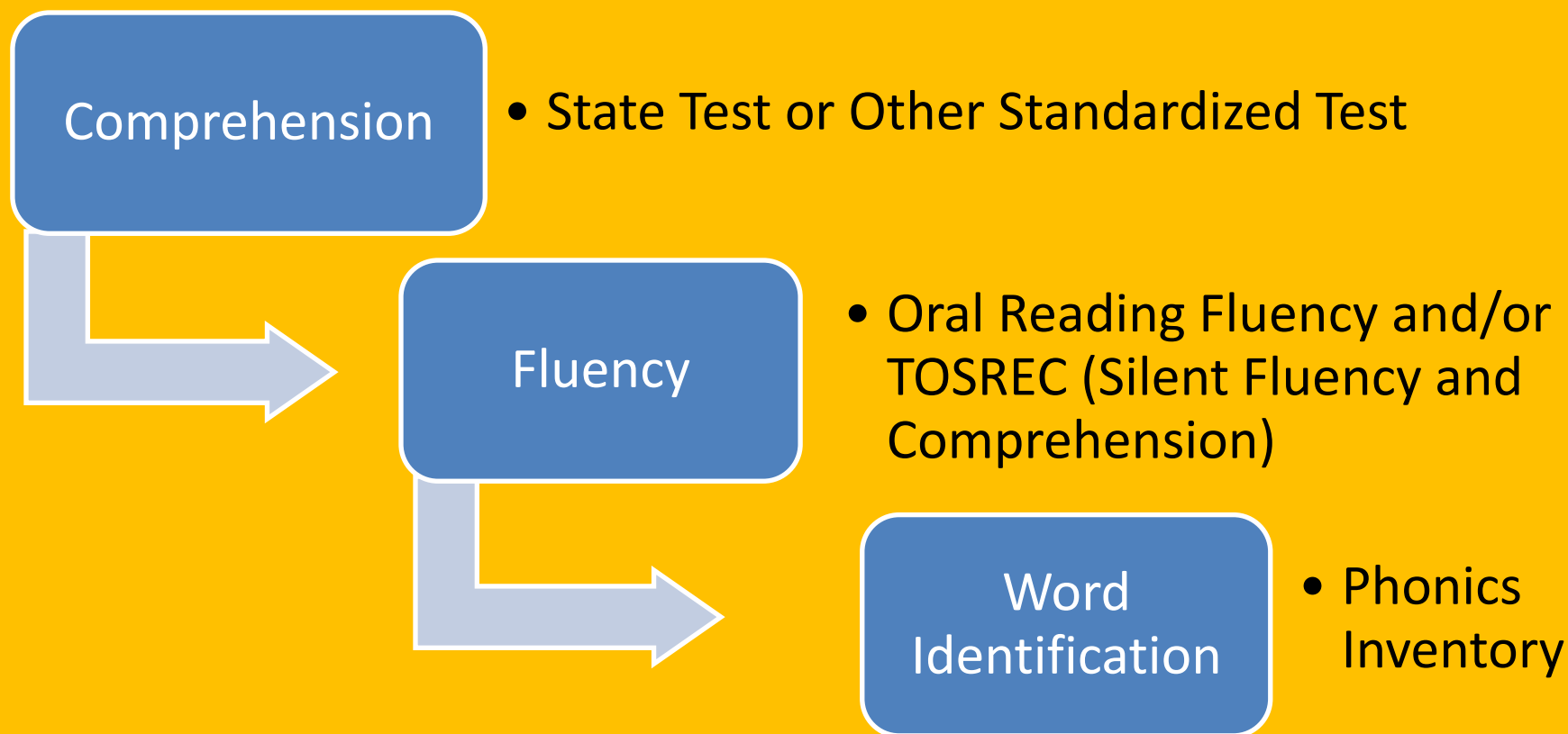
# One Example of a Tiered Middle School Reading Intervention



Denton et al., 2012, Brookes publishing.



# Screening, Identification, and Diagnostic Assessment



# RTI In Middle School

(Vaughn, Fletcher, and Others)

- Year 1: Tier 1 and Tier 2 intervention, Grades 6-8
- Year 2: Tier 3 Intervention for Low Responders, Grades 7-8
- Year 3: Continued Intervention for Low Responders, Grade 8

# Tier 1 in Middle School

- Implemented **across content area classes and reading classes**
- Small number of evidence-based **vocabulary and comprehension strategies taught and used consistently across classes**
- Teacher study groups in which they collaboratively planned lessons
- **“Bell-to-bell teaching”**
- **Active student involvement**



# Effective Instruction for Middle School Students with Reading Difficulties: The Reading Teacher's Sourcebook

Free Download from

[http://www.texasreading.org/utcrla/materials/middle  
school\\_instruction.asp](http://www.texasreading.org/utcrla/materials/middle_school_instruction.asp)

By Carolyn Denton, Sharon Vaughn, Jade Wexler,  
Deanna Bryan, & Deborah Reed

Also available from Brookes Publishing

## Tier 2 Students

- Struggling readers had failed the state high-stakes reading comprehension test or were on the “bubble” , or had not taken the test at grade level
- All read at least at a 3<sup>rd</sup> grade level
- Many had decoding and fluency problems as well as comprehension problems

# 6<sup>th</sup> Grade Study: Tiers 1 + 2

Vaughn et al., XX

- Struggling readers in 7 middle schools randomly assigned to Tier 2 intervention (n at posttest = 212) or Typical School Practice (n at posttest = 115)
- 3 urban schools (2 “inner city”); 4 located near a small city

# Tier 2 Implementation

- Took the place of an elective, about 50 minutes daily, year-long
- Class sizes of 10-15 students
- Researchers hired and supervised intervention teachers, who received substantial professional development



# Tier 2 Description

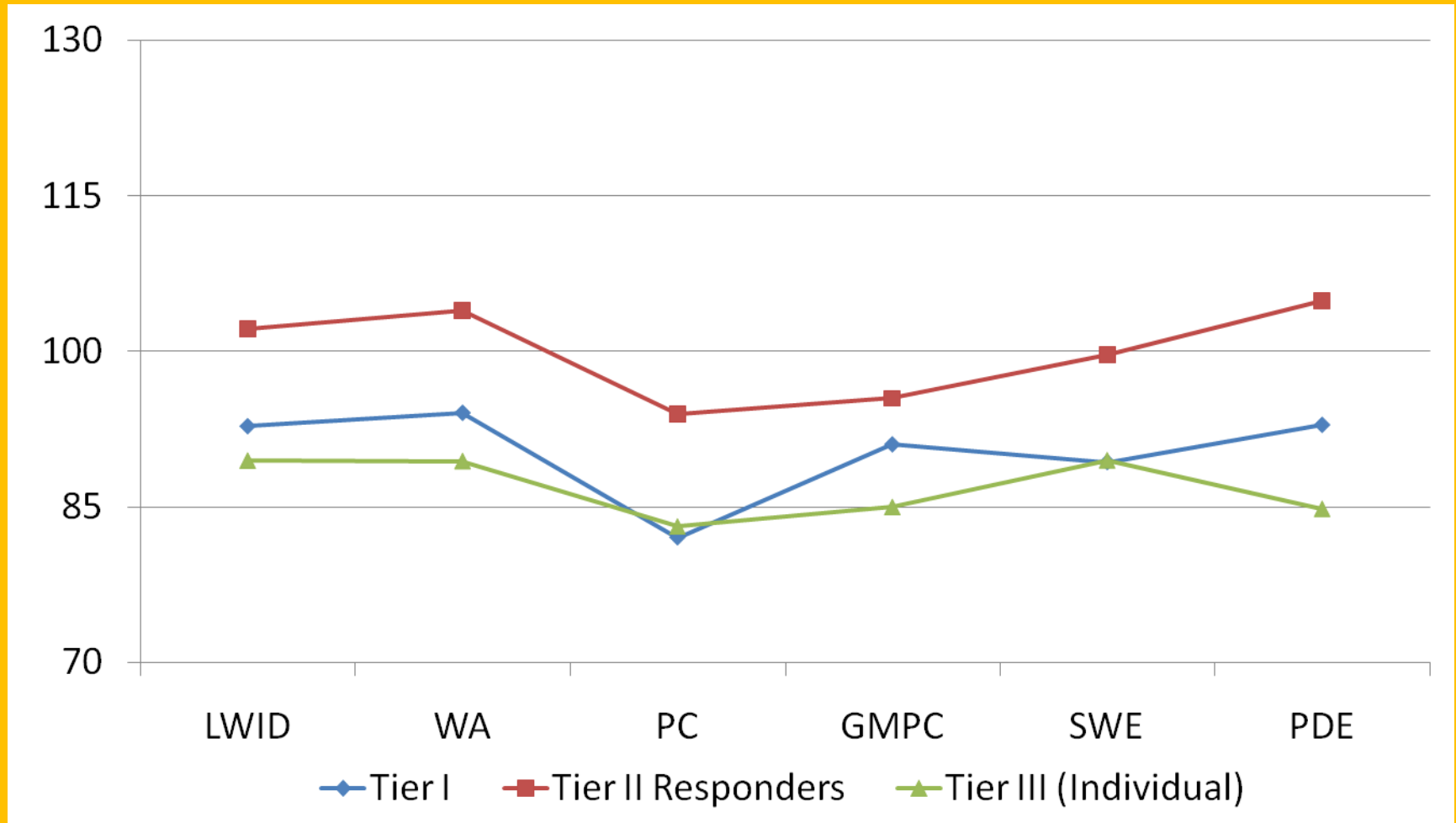
- Phase 1: Primary emphasis on multisyllable word study and reading fluency with secondary emphasis on vocabulary and comprehension (7-8 weeks)
- Phase 2: Primary emphasis on vocabulary and comprehension with secondary emphasis on word study and fluency (application of multisyllable word reading strategies learned in Phase 1) (17-18 weeks)
- Phase 3: Continued vocabulary and comprehension, with greater emphasis on independent student application of skills and strategies (8-10 weeks)



# Results: 6<sup>th</sup> Grade Study Tiers 1 + 2

- Tier 2 Intervention Group outperformed Typical Practice Group on word attack, spelling, the state accountability comprehension test, passage comprehension, and phonemic decoding efficiency.
- But...actual gains were small
- Effects were more apparent in particular subgroups of students (at a given site or at certain levels of pretest performance or age)

# Pretest Scores for Tier 3 Study



Mean = 100, sd = 15

# Tier 3: Grade 7

(Vaughn et al., 2011)

- Treatment students with low response in Grade 6 randomized to receive a standardized or individualized intervention
- Students still below benchmark in the comparison group continued in comparison condition
- No significant differences between standardized and individualized
- Treatment outperformed comparison on several reading outcomes

# Extended Tier 3: Grade 8

(Vaughn et al., 2012)

- Low responders to Grade 7 intervention received continued intervention in Grade 8
- Students still below benchmark in the comparison group continued in comparison condition
- Groups of 2 to 4, individualized intervention
- Treatment students performed significantly better than comparison in word identification and reading comprehension
- BUT treatment students did not close the gap with average students; **they maintained their discrepancy, while comparison students declined.**



Many people are suggesting a “triage” approach rather than a “tiered” approach for older students. Secondary struggling readers with the most severe problems are several years behind.

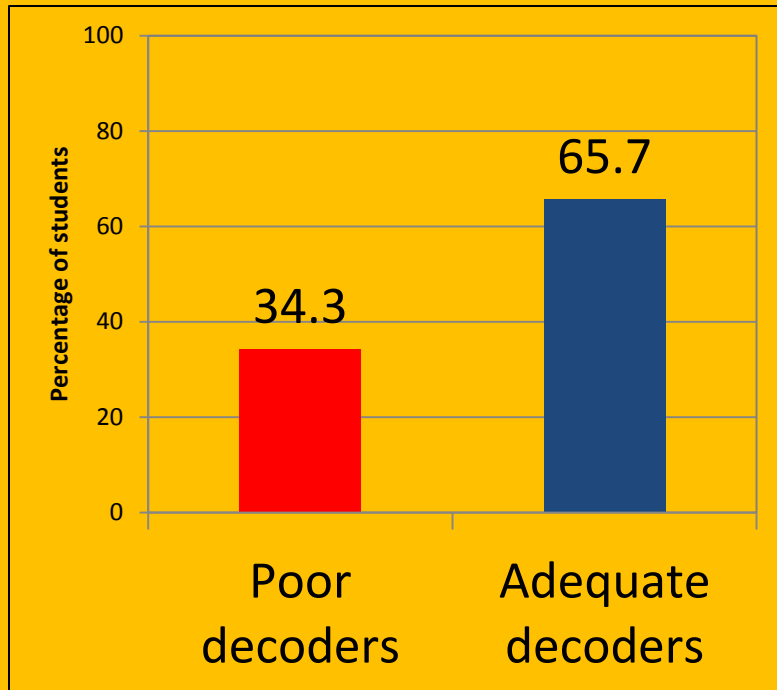
**Why put off intensive intervention?**

Vaughn, Denton, Fletcher, 2010

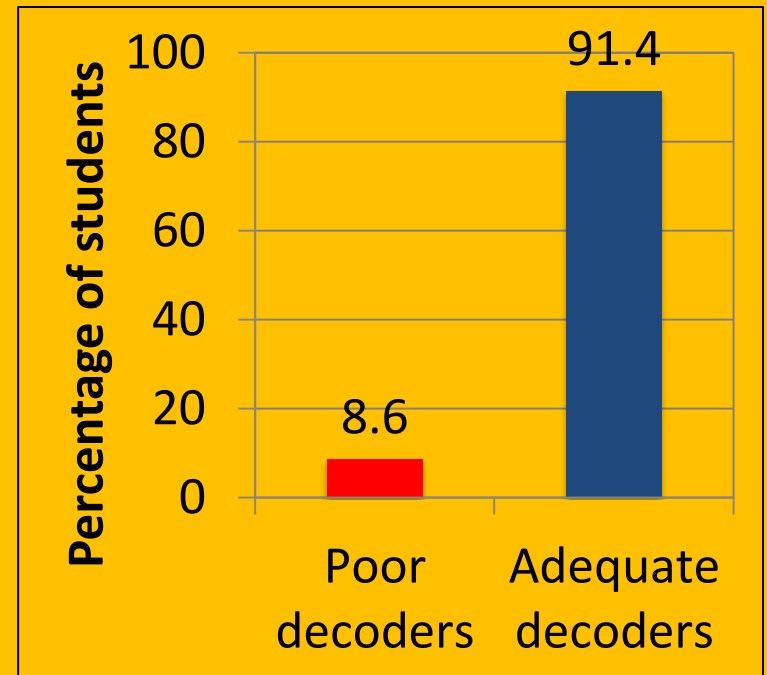
# Intervention for Older Students: Take-Away Messages

- **Adolescence is *not too*** late to intervene
- Problems are more complex, and **progress is typically slower** than in the primary grades
- **Serious reading difficulties are not easily remediated**; it may take several years
- Many students with comprehension difficulties also have word-reading problems; **provide a word identification program if needed**

# Percentage of Adolescents (G7-12) who Fail and Pass the Texas State Comprehension Test who are Adequate Decoders (above the 20<sup>th</sup> %ile on WJ III Letter-Word Identification)



**Poor  
Comprehenders**



**Adequate  
Comprehenders**

- **Implement a school-wide approach to enhanced vocabulary instruction** and the use of **a small number of consistent comprehension strategies** in every class
- **Comprehension strategy instruction is probably not enough** to overcome deficits in vocabulary and background knowledge.
- **Prioritize high-quality vocabulary instruction** and **look for ways to build background knowledge.**
  - **Read aloud** to students
  - Prioritize **expository text** reading
  - Ensure that **students read text** in content-area classes (use partner formats, etc.). Use graphic organizers to guide their reading.



# Interactive Graphic Organizers

- Help students understand relationships among key facts and concepts
- Can take many forms
- More effective if students are required to actively label, illustrate, sequence, etc.
- Students may write study guide questions using the graphic organizer.
- This supports literal understanding; students should be asked to use this literal information in some way to solve a problem or to connect it with other information

# Ocean Life

```
graph TD;
    OL[Ocean Life] --> P[Plankton];
    OL --> N[Nekton];
    OL --> B[Benthos];
```

## Plankton

What?

\_\_\_\_\_

How Move?

\_\_\_\_\_

How Small?

\_\_\_\_\_

Examples:

Algae \_\_\_\_\_

Animals

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

## Nekton

What? \_\_\_\_\_

How Move? \_\_\_\_\_

Where Live?

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

Examples:

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

## Benthos

What? \_\_\_\_\_

What Eat?

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

Examples:

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

**Photosynthesis**



**Respiration**

**Plants and Algae Use:**

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

\_\_\_\_\_ is combined  
with \_\_\_\_\_ to use the  
\_\_\_\_\_ in food.

**To Make**

1 \_\_\_\_\_

2 \_\_\_\_\_

**Produces**

1 \_\_\_\_\_

2 \_\_\_\_\_



# Voices of Students

“I would not mind starting over...But can you do that without my friends knowing about it? If so, I would love to learn my letter sounds again and learn how to pronounce words right. It would be good if I could figure out what words mean and could figure out what those stories mean.”

...A middle school student

McCray, Vaughn, & Neal, 2001

# Voices of Students

“I have been learning a lot. Some of the good things this year are that I can read what is on the menu for lunch. I tried to read the menu and would get so frustrated and I just had to stop. I used to shut down. I ate the same thing every day at school because I couldn’t read the menu. Now I still get frustrated, but I’m getting better.”

...A middle school student

McCray, Vaughn, & Neal, 2001

# Schools that “Beat the Odds”



# Characteristics of Schools with High Reading Performance Despite Challenges

- Strong instructional leadership
- Goal-setting and planning
- Regular assessment and monitoring of student progress
- Targeted instruction and intervention (A “whatever it takes” attitude)
- A “no excuses” approach with high expectations for every student
- A sense of urgency and a public commitment to learning

Denton, Foorman, & Mathes, 2003

# Cortez Elementary: Instructional Leadership

- Intervention is **not just for the students**. The principal, a former first grade teacher, is the **leader of her instructional team**.
- When a teacher needs assistance, the principal provides **mentoring and coaching**. She may personally go into a classroom to coach the teacher and model instructional approaches, send a reading specialist in, or send the teacher to get targeted training.
- At the same time, **the principal supports the teachers and provides what they need to succeed**. She has removed many of their duties, freeing their time for collaboration and planning for at-risk students.



# Pinedale School: Goal-Setting, Shared Responsibility with Central Coordination

- **Nothing is left to chance**, and no child is allowed to “fall through the cracks”
- At the beginning of each year, the teachers ***evaluate each child and set individual goals*** based on the results.
- **Classroom teacher is the “case manager”** for each student in her room. Students may receive services from other specialists, but the teacher coordinates the services and has ultimate responsibility for the student.

# Pinedale School: Assessment

- **Reading progress** of each Tier 2 and 3 child is **monitored weekly**
- **Principal meets with teams of teachers weekly** to look at the results and discuss changes that need to be made if a child is not on track to meet his/her reading goals.
- When a child is not on track, **everyone works together** to devise a plan
- Discussion is *descriptive* rather than *punitive*. **ALL** teachers and administrators are responsible for the progress of **ALL** students.

# Cortez Elementary: Intervention

- Principal describes “relentless” intervention
- Classroom teachers : 90 minutes of core reading instruction each day plus short-term Tier 2
- If needed, tutoring before or after school (in addition to the above).
- If needed: extra 45-minutes from a reading specialist each day
- Most at-risk taught by a dyslexia specialist.
- The most at-risk students, and students with reading difficulties who move into the school get “intensive care”, a special short-term intervention during recess (with prizes and pizza for motivation).

# Prospect School District Elementary Schools: Concentrated, Coordinated Intervention

- Universal screening and progress monitoring with **extensive use of the data** at the district, school, and classroom levels
- **Extensive, targeted teacher professional development** (principals attend too)
- **Tier 1: 90-minute daily reading instruction** with an **evidence-based core program** and small-group instruction
- **Classroom reading teachers provide extra short-term skills-based intervention** based on specific needs

# Prospect School District Elementary Schools: Grade 1 Intervention

- Reading specialists “push-in” to provide small-group intervention to Tier 2 and 3 Students during the **regular reading block** (intervention students receive a small group lesson from their regular teachers AND another one from the specialist)
- The same reading intervention teachers provide **supplemental “Tier 3” intervention to students with the most severe needs** (identified at the beginning of Grade 1 rather than waiting for Tier 2 to be ineffective)

## ***Eastport Elementary: Thinking Outside the Box***

- No designated reading interventionists; 4 first grade classrooms
- For 40 minutes every day, at-risk students go to intervention while all others have science/social studies
- Every day, during science and social studies times, 2 1<sup>st</sup> grade teachers take larger classes to free up the other 2 to deliver intervention; 2 special education teachers also provide small-group intervention during the same period
- Intervention is provided to 4 groups of 3-4 of the most at-risk students from each classroom for 40 min. per day
- Teachers are trained and coached in delivery of a research-validated intervention

# MLK Middle School: Instruction and Intervention

- **All students receive a reading class every day**
- Students are grouped according to ability; assessed and re-grouped every 6 weeks; instruction is provided at students' levels
- **ALL teachers at a grade-level provide reading instruction during one class period each day** (including content-area teachers, the gym teacher and the librarian!)
- Implement a research-supported scripted program
- Teachers receive professional development and coaching in implementing the program
- Struggling readers receive small group intervention during this same period.

# “No Excuses” Attitude: Cortez Elementary

Principal:

*“We (should be) able to see that we are teaching what the child needs to learn, and if not--why? And so we always are looking at ourselves. Is it our curriculum; is it the strategies the teacher might not have?”*



Teacher at Cortez Elementary: “As  
*professional educators we are  
responsible for teaching children to  
read. If they have an awful home life,  
we still have to teach them to read.  
We can’t have excuses, even if parents  
are in jail or homeless.”*

# A Sense of Urgency

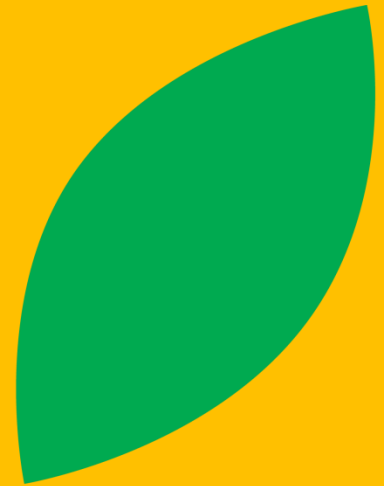
*“If (there is) a very at-risk child, ...we adjust the schedule of the child. If he needs extra help, that next day he will have a reading specialist work with him. If that’s not enough, then we have tutorials, and another teacher will work with him. We’ve built all of these safety nets to protect children who are at-risk. **A child who is very at-risk will have a schedule that is very different from other students.**”*

...A school principal in Denton, Foorman, & Mathes (2003)

# The bottom line...

*Students who are performing below grade level will only close the gap with their classmates if they learn **FASTER** than other students.*

***More Instruction  
Efficient Instruction  
More Practice***



*How can you convey a sense  
of urgency in your school or  
schools?*

# Einstein's Definition of Insanity

*Doing the **same thing** over and over again and expecting different results.*



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Carolyn Denton, Ph.D.

[Carolyn.A.Denton@uth.tmc.edu](mailto:Carolyn.A.Denton@uth.tmc.edu)

Parts of this presentation were based on the article:

Denton, C.A. (2012). Response to intervention for reading difficulties in the primary grades: Some answers and lingering questions. *Journal of Learning Disabilities*, 45, 232-243.

## **RTI: Selecting and Implementing Evidence-Based Reading Interventions**

### **Reflections**

**1. *How might our current understanding of reading difficulties and disabilities affect practices in your school or classroom?***

**2. *Where is your school in implementing RTI?*** (Universal screening, Tier 1, Tier 2, Tier 3, Progress monitoring, Professional development)

- Exploration
- Commitment and Adoption
- Partial Implementation
- Full Implementation
- Sustainability

**3. *How might research on RTI in the early grades inform your implementation of RTI?***

*Identify one idea to take back to your colleagues related to each intervention tier.*

- Tier 1
- Tier 2
- Tier 3



***4. What is the biggest challenge to RTI implementation in your school?***

***What is one idea for overcoming that challenge?***

***5. How can you convey a sense of urgency in your school or schools?***

## **Resources for Information on Research-Validated and Evidence-Based Programs and Practices**

### **1. What Works Clearinghouse Practice Guides**

- Teaching Elementary School Students to Be Effective Writers
- Improving Mathematical Problem Solving in Grades 4 through 8
- Developing Effective Fractions Instruction for Kindergarten through 8th Grade
- Improving Reading Comprehension in Kindergarten through 3<sup>rd</sup> Grade
- Using Student Achievement Data to Support Instructional Decision Making
- Helping Students Navigate the Path to College: What High Schools Can Do
- Structuring Out-of-School Time to Improve Academic Achievement
- Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools (2009)
- Assisting Students Struggling with Reading: Response to Intervention (RtI) and Multi-Tier Intervention in the Primary Grades (2009)
- Turning Around Chronically Low-Performing Schools
- Reducing Behavior Problems in the Elementary School Classroom

### **2. What Works Clearinghouse Intervention Evaluations**

Sample WWC Reading Intervention Reports

- Reading Mastery
- Waterford Early Reading Program
- Early Interventions in Reading (SRA)
- Ladders to Literacy (Early Childhood)
- Read 180

NOTE: The WWC reviews have VERY high standards for research quality.

3. **Florida Center for Reading Research:** [fcrr.org](http://fcrr.org)

4. **Meadows Center for Preventing Educational Risk :** [meadowscenter.org](http://meadowscenter.org)

5. **Texas Center for Learning Disabilities:** [texasldcenter.org](http://texasldcenter.org)

6. **Center on Instruction:** [centeroninstruction.org](http://centeroninstruction.org)

- Literacy
- Science, Technology, Engineering, Mathematics (STEM)
- English Language Learning
- Special Education
- RTI
- e-Learning
- Early Learning

7. **National Center on RTI**

**Tool Charts-** Resources for evaluation of studies on interventions and assessments

<http://www.rti4success.org/>

<http://www.rti4success.org/instructionTools>

Program	Study	Study Quality					Effect Size			
		<u>Participants</u>	<u>Design</u>	<u>Fidelity of Implementation</u>	<u>Measures</u>		# of Outcome Measures	Mean based on adjusted posttests	Mean based on unadjusted posttests	Disaggregated Data Available
					<u>Proximal</u>	<u>Distal</u>		Proximal (P) Distal (D)	Proximal (P) Distal (D)	
<a href="#">Lexia Reading</a>	<a href="#">Macaruso &amp; Rodman (2009)</a>	●	◐	○	●	●	6 Reading 1 Writing	P = 0.10 D = -0.08	P = -0.35 D = -0.19	No

Macaruso, P., & Rodman, A. (2009). *Benefits of computer-assisted instruction for struggling readers in middle school. European Journal of Special Needs Education, 24(1), 103-113.*

### Lexia Reading - Effect Size - Full Sample

**Proximal Measures** (closely aligned with the intervention)

Construct	Measure	Effect Size	
		based on adjusted posttests	based on unadjusted posttests
Reading	Word Attack	0.51	0.27
Reading	Letter-Word Identification	0.05	-0.46
Reading	Reading Fluency	-0.20	-0.67*
Reading	Reading Vocabulary	-0.03	-0.51
Reading	Passage Comprehension	0.16	

NOTE: Effect sizes of .20 = small; .50 = medium; and .80 = large. Effect sizes of .25 and larger are considered “substantively important” by the What Works Clearinghouse. Positive effects favor the experimental treatment; negative effects favor the comparison group.

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## Handout 3

### Adaptation Activity

Imagine that a first grade teacher has taught a lesson on sounding out words with the ai vowel team (rain, train, etc). One group of students impulsively guesses words rather than using sounding-out strategies.

How might the teacher adapt instruction for this group? Think about all 4 types of adaptations.

