

Treating Dyslexia and Other Reading Disabilities With Research-Based Approaches

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Dys-lex-ia

- A word meaning “difficulty with language” or “difficulty with words”, from the Greek morphemes “dys” and “lex”
- Synonymous with “specific reading disability” – a problem learning to read that is unexpected in relation to experience, originating in neurobiological differences in the way the brain processes language

We Used to Think

- That dyslexia meant “seeing things backwards”
- That dyslexia affected boys more than girls
- That dyslexia only occurred in “average to above average” children
- That left handedness predicted dyslexia
- That we couldn’t diagnose dyslexia until after first grade was completed

Research is Promoting Changes in Practice...

- 30 years of research in reading and learning disabilities at multiple sites by hundreds of researchers from many academic disciplines (educational psychology, cognitive psychology, neurosciences, linguistics, genetics, etc.)
 - Several thousand articles, book chapters, books
 - Funded by the National Institute of Child Health and Human Development (NICHD); United States Department of Education; universities and private foundations
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What Research on Reading?

National Reading Panel (2000)

National Research Council (Snow, Burns,
and Griffin, 1998)

American Psychological Society (Rayner et
al., 2001)

Learning First Alliance (1998, 2000)

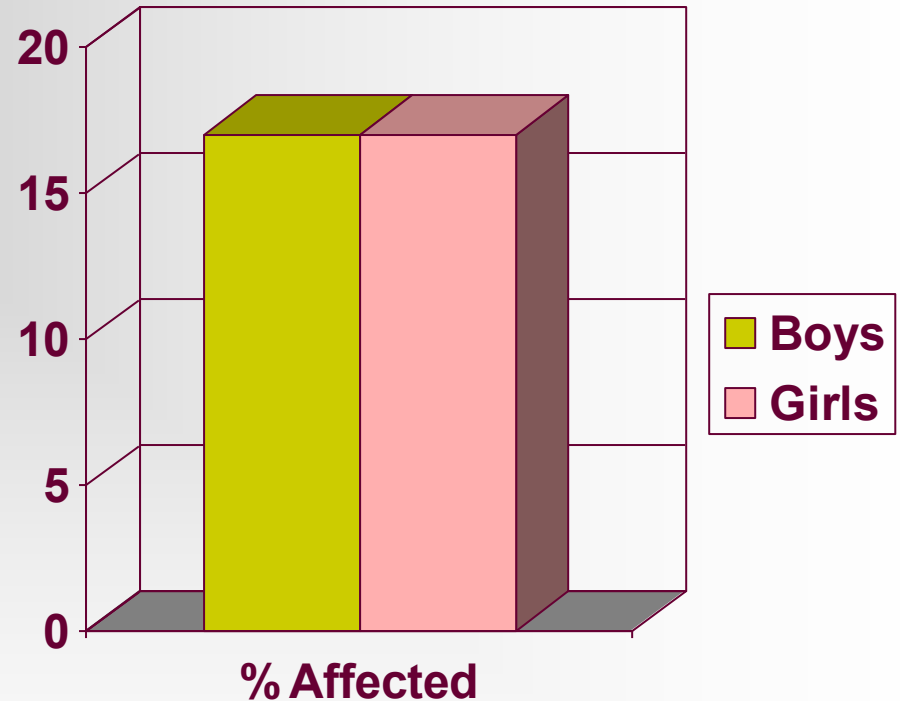
American Speech-Language Hearing
Association (2001)

Research Findings (NICHD)

- Boys and girls are equally afflicted.
- About 20% of all children have significant difficulty learning to read, but the prevalence figure varies according to the instruction available to K-3 students.
- When instruction is optimal, all but about 5% can be brought into the average range in reading.

How Many People Have Reading Disabilities?

- 17 % of children have difficulty learning to read
- Girls are just as likely to be affected as boys



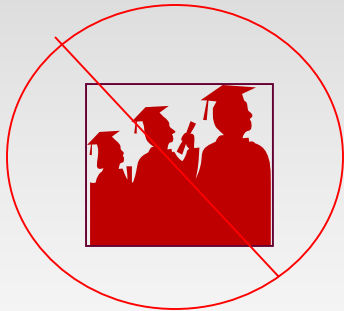
According to the National Institutes of Health (NICHD Branch)

Who Is Affected by Reading Disabilities?



Not dependent on socioeconomic status (SES)

Not dependent on intelligence (can be gifted and dyslexic)

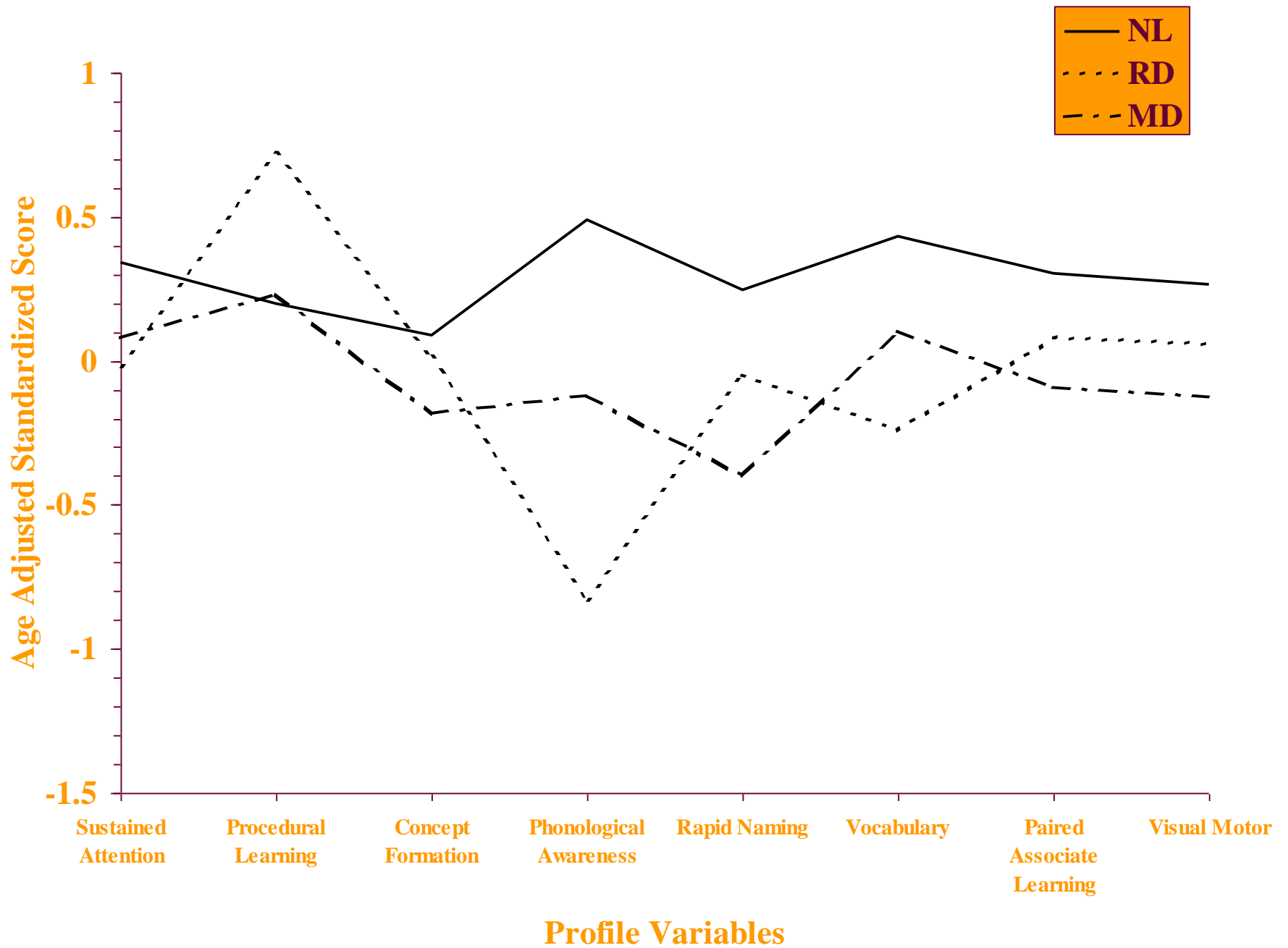


Not dependent on parent's level of education

Dyslexia is a difference in the way the brain processes information. It is influenced by heredity.

The Cognitive Characteristics of a Poor Reader

- Specific weaknesses in phonological processing, letter knowledge, and alphabetic understanding predict reading outcomes, K-2
 - “Lower level” processing difficulties with the alphabetic code:
 - phoneme awareness, phonological memory
 - letter naming speed
 - knowledge of sound-symbol correspondences
 - accuracy and fluency of word recognition
 - Vocabulary, knowledge of literate language (as children get older)
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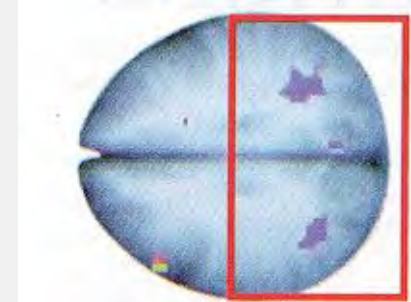


Aspects of Phonological Processing

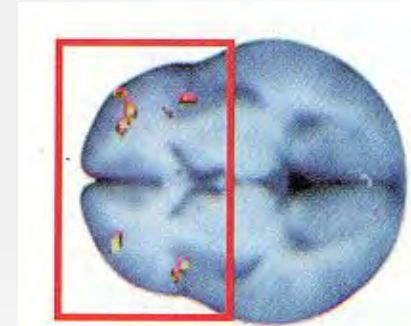
- Phonological awareness
- Phonological retrieval
- Phonological memory (encoding and storage of words, digits, and letters)
- Novel word repetition
- Speech production of single phonemes and phoneme sequences

The Brain of a Person With Dyslexia Activates Different Areas

Brain of a normal reader (or non-dyslexic) activates at the back



Brain of a dyslexic reader activates primarily in the front

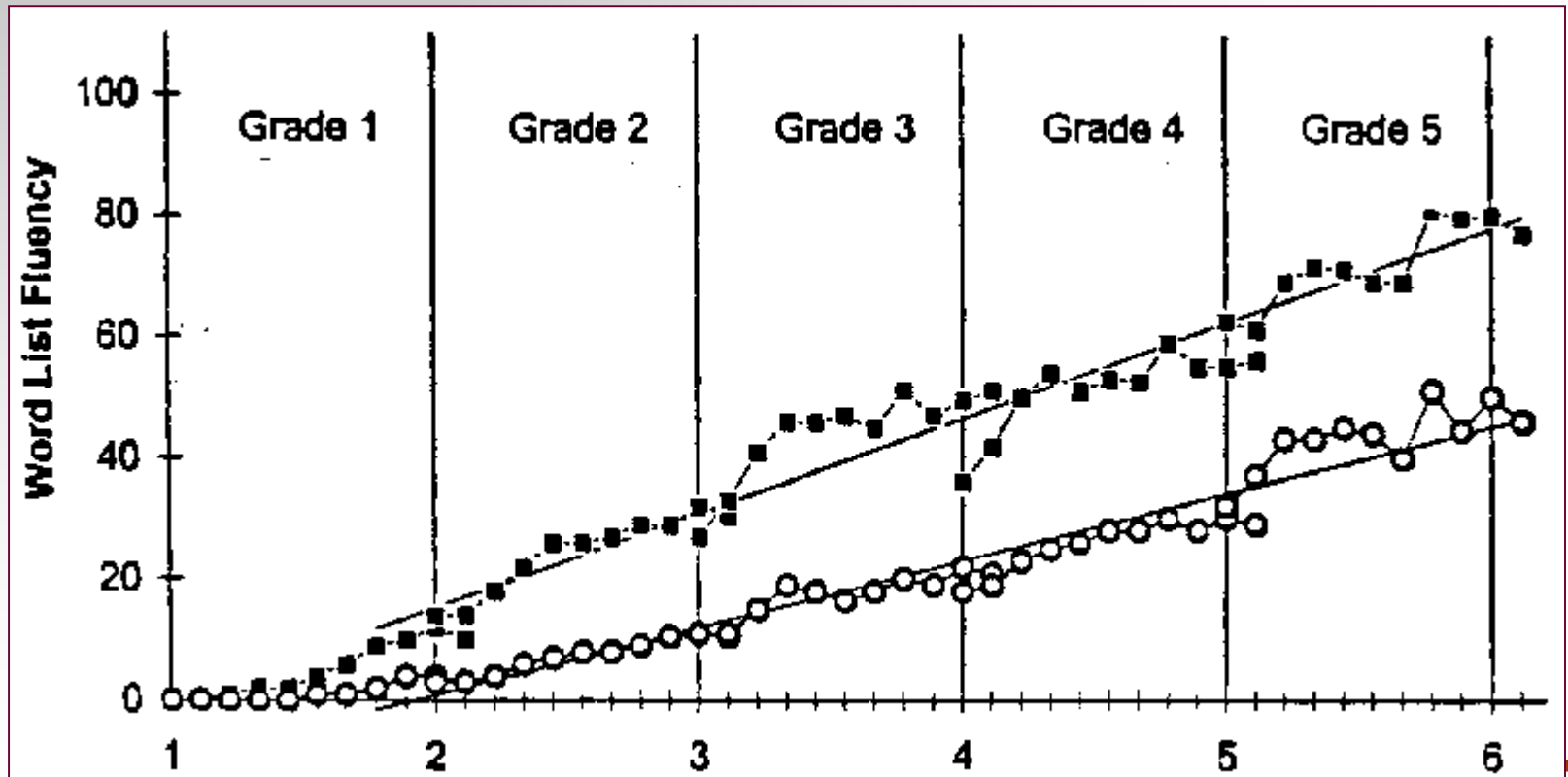


S. Shaywitz, Overcoming Dyslexia

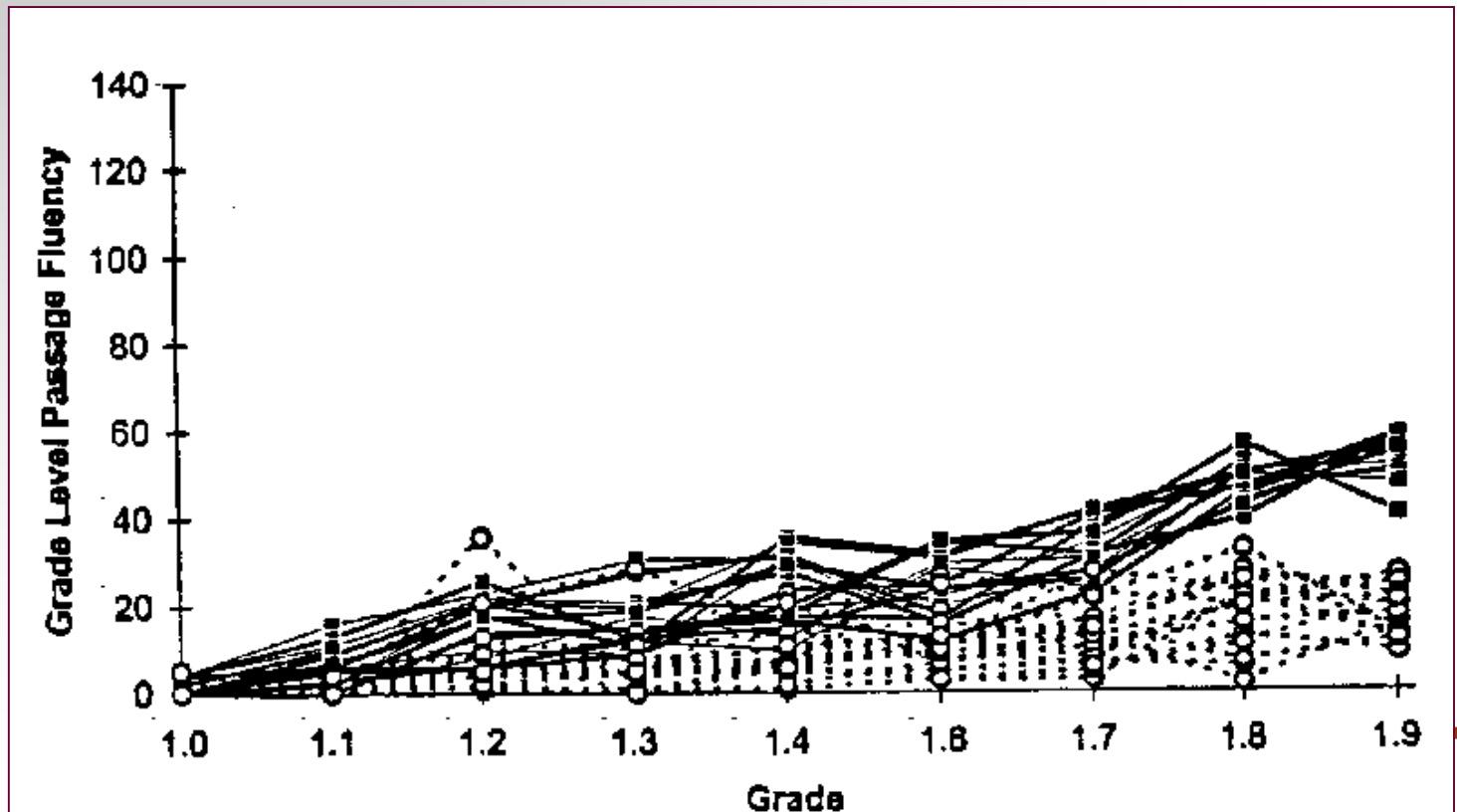
Children Don't Catch Up...

- Once children fall behind, they are likely to stay behind and the gap is likely to widen
 - C. Juel, 1994 (Harvard Graduate School of Education)
 - J. Torgesen, K. Stanovich, F. Vellutino (NICHD)
 - A. Biemiller (Toronto)
 - R. Good, E. Kame'enui, D. Simmons (U. of Oregon)
 - S. Shaywitz and J. Fletcher (Connecticut Longitudinal Study)

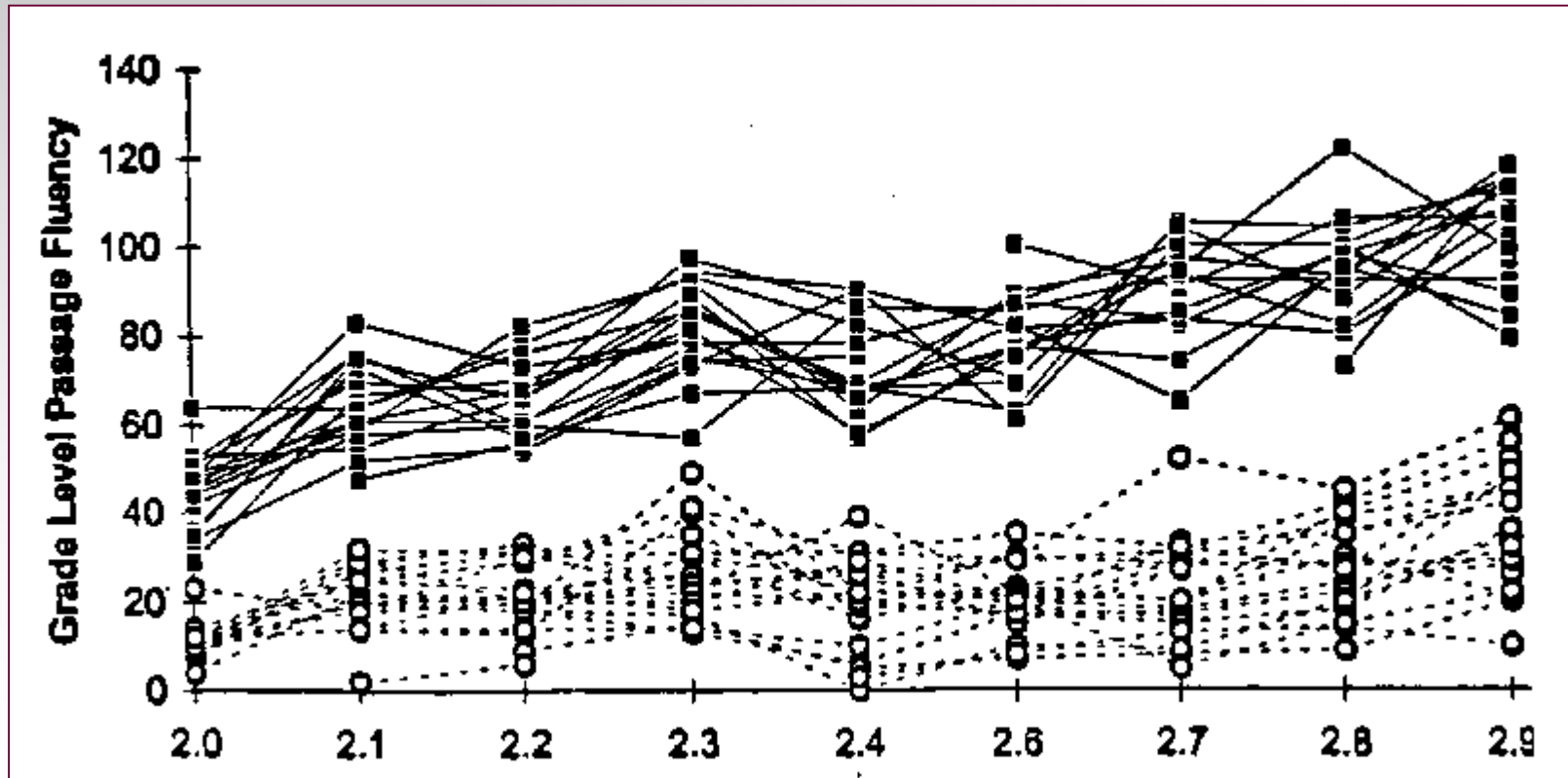
Growth Rate Toward Reading Achievement Is Established Early



Traditional Reading Tests Identify Children Too Late



Established Reading Trajectories Are Difficult to Change



Grades K-2, Symptoms

- Trouble segmenting and blending sounds
- Poor letter-sound recall
- Poor application of phonics
- Inconsistent memory for words & lists
- Mispronouncing words
- Inability to spell phonetically

Grades 3-4, Symptoms

- Phonic decoding is a struggle
- Inconsistent word recognition
- Poor spelling, dysphonetic
- Over-reliance on context and guessing
- Trouble learning new words (spoken)
- Confusion about other symbols

Grades 5-6, Symptoms

- Poor spelling, poor punctuation
- Reverts to manuscript from cursive
- Organization of writing is difficult
- Decodes laboriously, skips unknown words
- Avoids reading, vocabulary declines

Grades 7-8, Symptoms

- Slow reading, loses the meaning
- Persistent phonological weaknesses, less obvious
- Poor spelling and writing
- Confusions of similar words
- Does better with structured, explicit teaching of language

Grades 9+, Symptoms

- Trouble with foreign language study
- Writing and spelling problems persist
- Reading is slow and labored, can't sustain
- Longer writing assignments very difficult
- Can cope when given extra time, study strategies, and structured language teaching

Are Dyslexic Poor Readers Distinguishable From Other Poor Readers?

- 38% of all children are “below basic” on NAEP
- 44% are dysfluent on NAEP (1992 study)
- 25% of the adult population in the US are functionally illiterate (U.S. Dept. Labor)
- 70% or more of low SES, minority children fall behind early and are not likely to catch up to grade level

Are Students With IQ Discrepancies (LD) Different From Other Poor Readers?

In cognitive characteristics?

In characteristics of reading, spelling, and writing behavior?

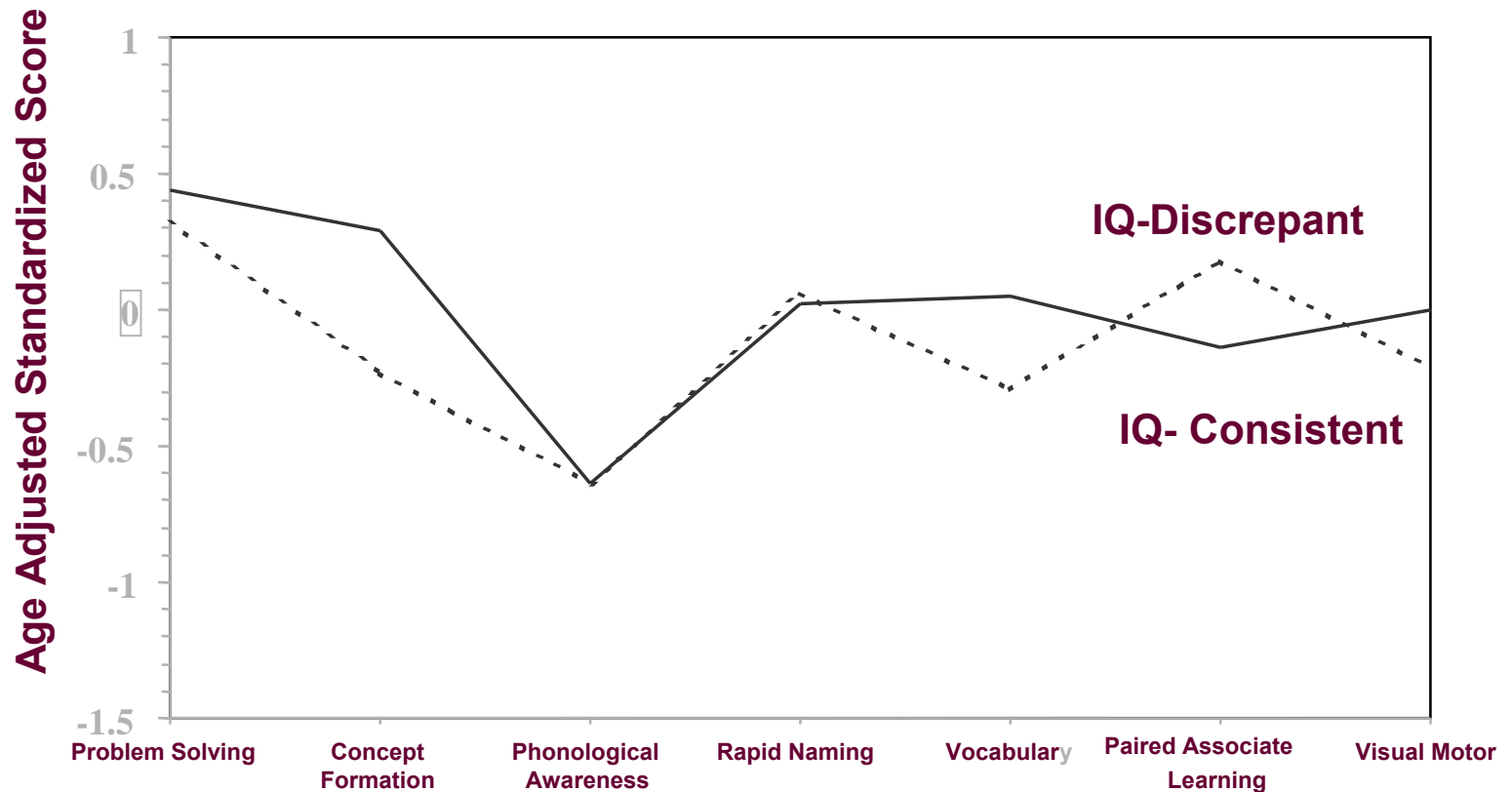
In response to instruction?

Hoskyn and Swanson (2000) meta-analysis

Stuebing et al. (2001) Meta Analysis

Negligible Cognitive Differences Between “LD” and “Poor Reader”

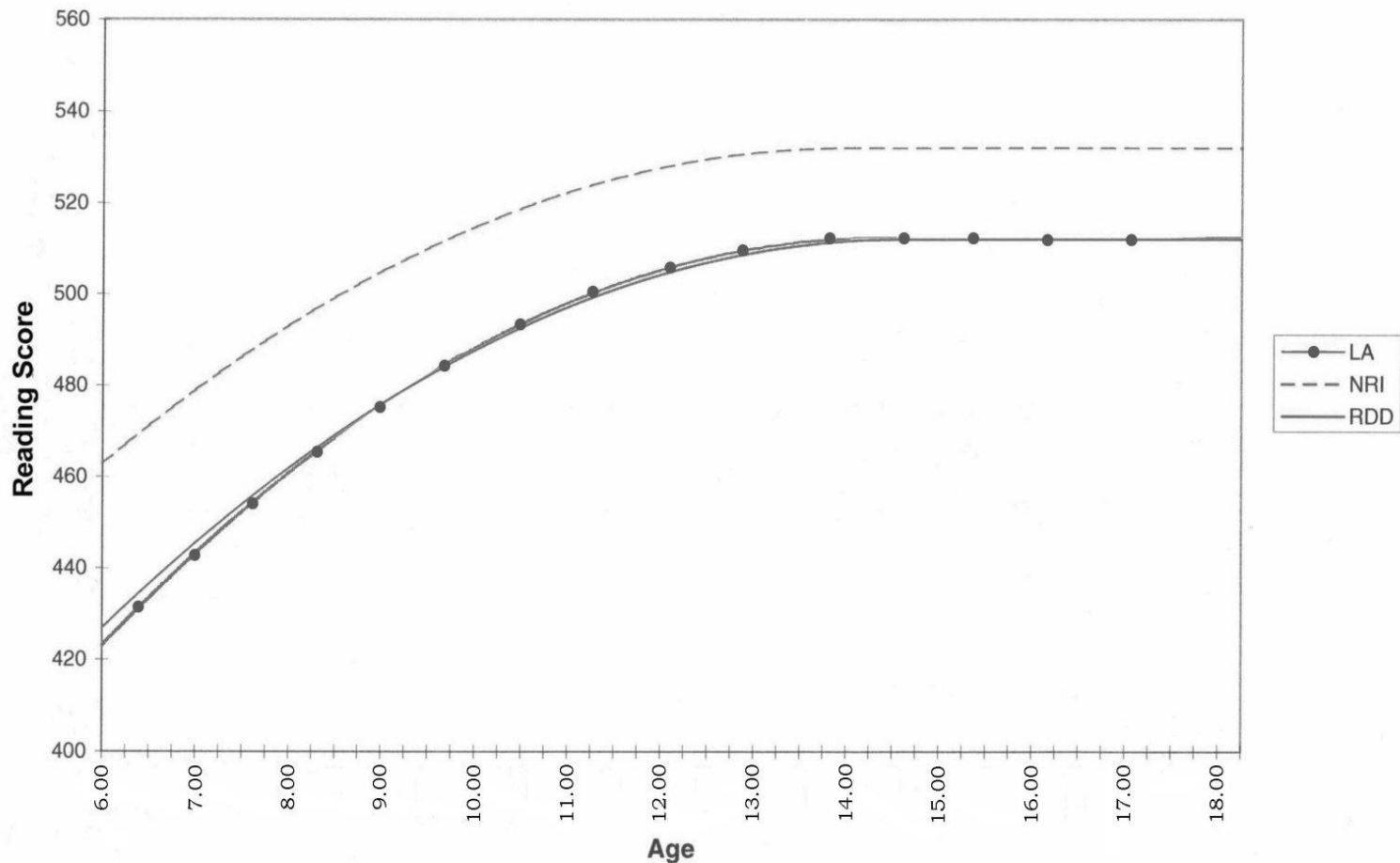
Reading Difficulty Groups



Prognosis: Are Long Term Outcomes Distinctive for “LD” Defined Group?

- Children who are IQ-discrepant and IQ-consistent do not differ in the long-term development of reading ability. (Francis et al., 1996; Silva et al., 1987)
 - “Garden variety poor readers” are numerous and very much like those with certified reading disabilities.
-

Prognosis of Discrepancy-Defined and “Low Achievers” Francis et al. (1996)



In other words...

There is every reason to intervene early with *any* child “at risk” for reading difficulty.

Our goal is to *change the prediction* of long term outcomes.

Children needing intervention should be identified in ways that do not require an IQ measurement.

Children’s response to instruction is one factor in determining whether they are dyslexic.

Response to Intervention

- Studies of responsiveness to intervention generally do not find any difference between children with and without IQ-discrepancies. (Lovett, Morris, Wolf)
- IQ tests are less important in predicting response to intervention than direct tests of specific reading and reading-related skills

What Does This Evidence Mean?

Children classified as “LD” and children who are non-special education poor readers do not differ in:

- Individual Characteristics
- Cognitive Profiles
- Prognosis
- Response to intervention

(Stanovich & Siegel, 1994, p. 48)

Indications for Policy and Practice (1)

We should focus much more on intervention and outcomes for all poor readers, rather than eligibility for special services.

- Promote school-wide ownership of literacy outcomes and reading problems.
- Find children “at risk” BEFORE they fail; focus resources on validated reading interventions for all children who need them.

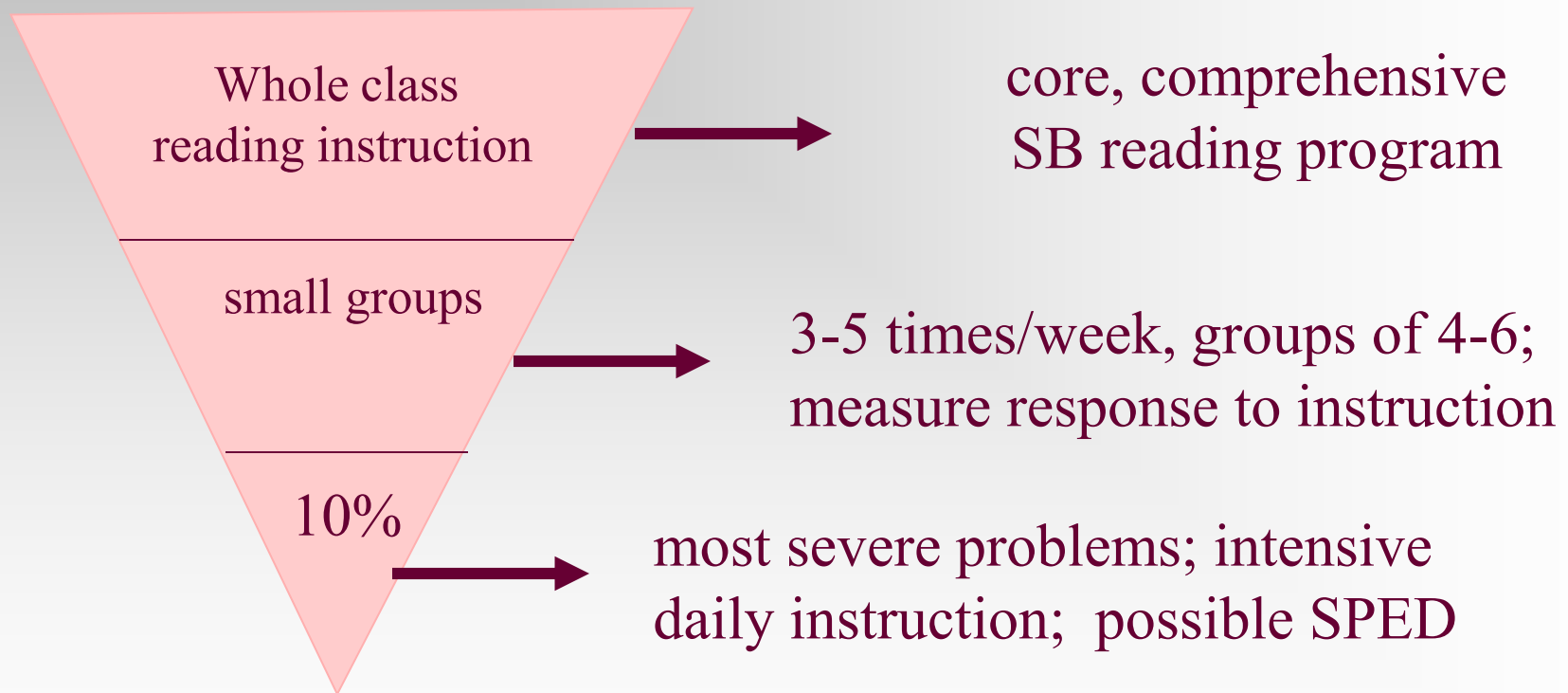
Indications for Policy and Practice (2)

- Prioritize assessment for instruction, not classification.
 - Use efficient, valid, reliable screening tools with ALL children beginning in kindergarten or earlier, if possible.
 - Expect classroom teachers to collaborate with specialists in delivery of research-based reading instruction and to use research-validated instructional programs and methods.

Indications for Policy and Practice (3)

- Organize instructional resources around a “three tier” model
 - (Tier 1) regular classroom core, comprehensive reading program
 - (Tier 2) small group instruction for those mildly “at risk”
 - (Tier 3) intensive, systematic reading instruction for those below the 10th %ile

The “Three-Tier” Intervention Model



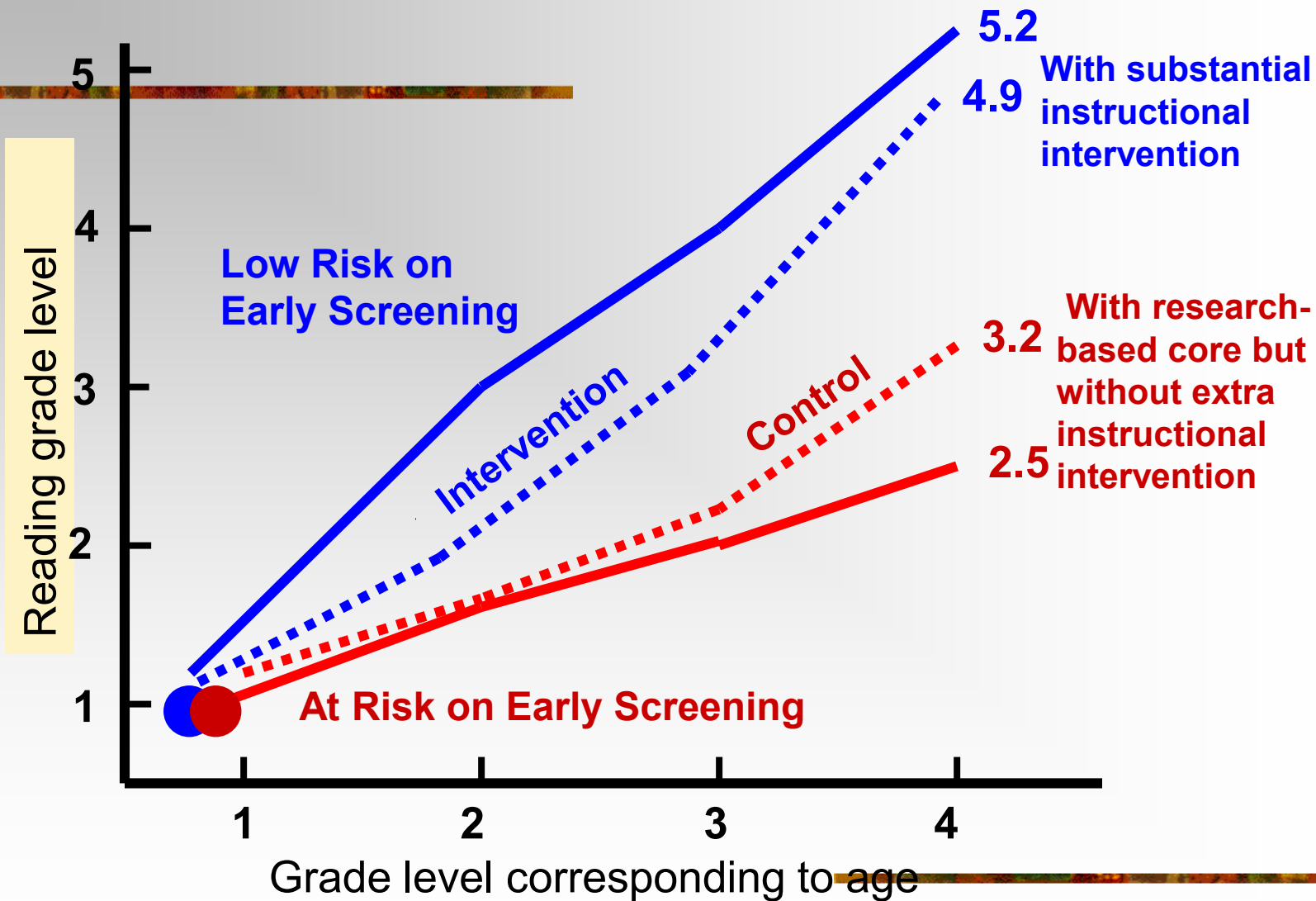
Early Detection Instruments...

- DIBELS (University of Oregon)
 - TPRI (University of Texas)
 - AIMSweb
 - Voyager benchmark assessments
 - Fox in a Box (Marilyn Adams, McGraw Hill)
 - Wagner and Torgesen's Comprehensive Test of Phonological Processing
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Diagnostic Tests for Dyslexia

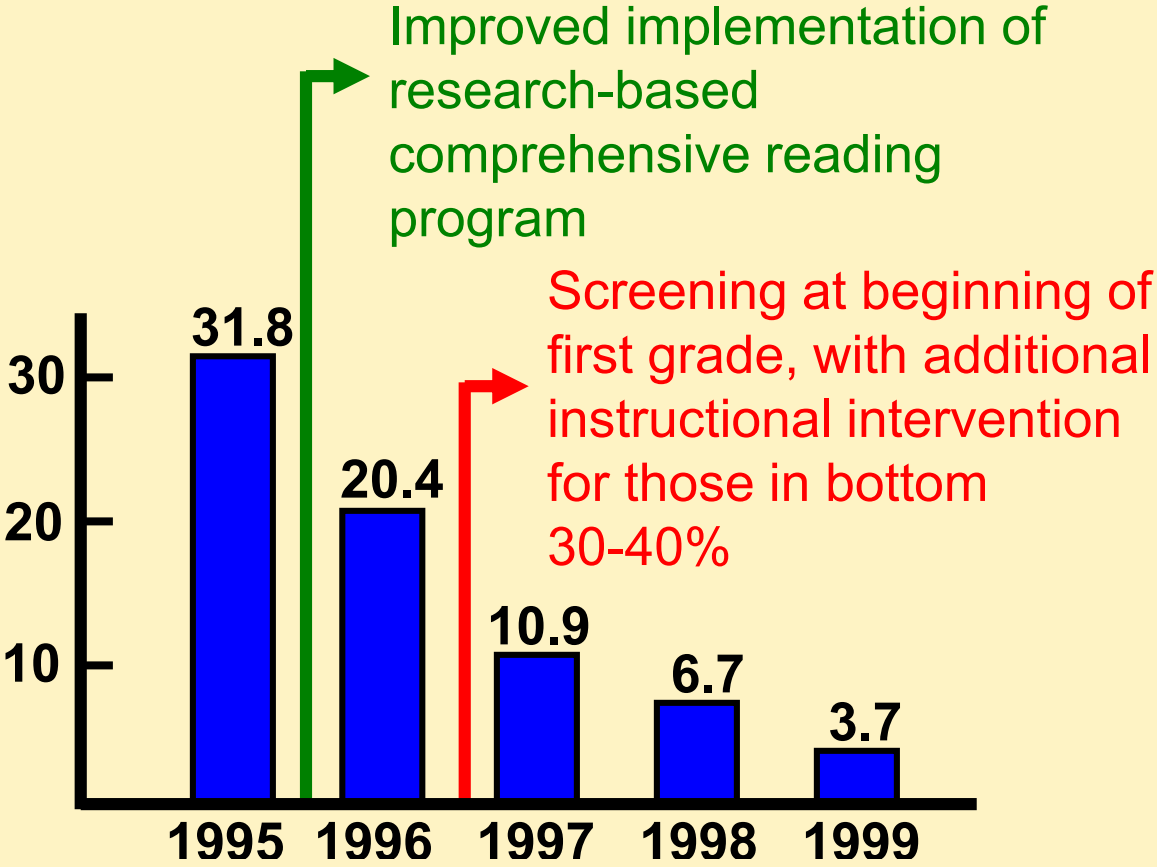
- Phonological awareness
 - Nonword repetition (oral)
 - Rapid automatic naming of objects, colors, letters, numbers
 - Phonics and spelling
 - Text reading fluency and accuracy
 - Test of word reading efficiency (Torgesen, Pro-ed), real and nonwords
-

Early Intervention Changes Reading Outcomes



Hartsfield Elementary School Progress Over Five Years

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



Average Percentile for entire grade (n=105)

1995 48.9 1996 55.2 1997 61.4 1998 73.5 1999 81.7

Comprehensive, Integrated Instruction: It *is* Rocket Science!

Comprehension and Written Expression
Reading Fluency
Vocabulary Knowledge
Phonics, Word Study, and Spelling
Phoneme Awareness
[written expression and oral language]

-*Put Reading First, 2001*

All Components of Language Must Be Addressed (ASHA & IDA)

Phonological processing – awareness of speech sounds

Orthographic processing – attention to and memory for letters and letter patterns in printed words

Morphology – the meaningful parts of words and how they are typically spelled

Word meanings (semantic processing)

Sentence sense (syntactic processing)

Academic discourse – paragraph organization and genre structures, figurative language, word choice and word use in formal contexts, inferential comprehension

What Happens In a Lesson?

- Speech sound awareness
 - Sound-symbol links (see, say, write)
 - Learning a new letter pattern in print
 - Blending sounds in the printed word
 - Increasing speed in word, phrase, sentence, and book reading
 - Writing words with the patterns learned
 - Vocabulary – building word meanings
 - Applying comprehension strategies
-

Phoneme Awareness AND Phonics: They Are Not The Same!

- Phoneme awareness provides the foundation for learning phonics and for differentiating similar words in speech

/b/	/r/	/l/	/t/
↓	↓	↓	↓
b	r	igh	t

The Alphabetic Principle: Phoneme-Grapheme Mapping

c	o	t				
c	augh	t				
sh	ou	t	i	ng		
s	l	u	dge			
s	c	r	i	m	p	s

Phoneme-Grapheme Fluency:

- Read as fast as you can:

rid ride hid hide kit kite

ride hide rid hid kit hide

hid kit rid hid kite kit ride

Word Identification Fluency

- Read as fast as you can:

do does done don't any many

does any done do does don't

any does many do don't done

does any many don't does done

many do any does do

(P. Fischer, Concept Phonics Speed Drills, Oxton House, Morrill, Maine)

Pattern Recognition & Recall

How do we spell /j/ at the ends of words?

charge

wage

dodge

splurge

stooge

ridge

bilge

stage

fudge

indulge

oblige

wedge

sponge

huge

badge

Syllable Types and Connections

napkin

circus

Friday

poodle

muffin

perfect

lady

cattle

connect

turkey

motor

people

helmet

market

even

hobble

amaze

describe

complete

admire

awake

postpone

From Syllables to Morphemes

- trac-tor
- gen-tle
- mo-vie
- wan-ted
- ma-king

- tract-or
 - gent-le
 - mov-ie
 - want-ed
 - mak(e) – ing
-

Beyond Phonics – Word Study and Spelling

Layers of English	Sound-symbol	Syllable	Morpheme
Anglo-Saxon	<i>truck, bump, grab, smell</i>	<i>shinny surface</i>	<i>dumped leftover</i>
Latin			<i>department observe</i>
Greek			<i>bronchitis</i>

Systematic Instruction

- Directly teach a set of sound-letter, syllable, and morpheme spellings
- Give guided and independent practice of what has been taught
- Follow a developmental sequence until fluency is achieved

The past tense “ed” is pronounced three different ways, /t/, /d/, and /ed/. Let’s see if we can tell which sound ends each word:

liked

hoped

recovered

decided

Systematic Instruction (2)

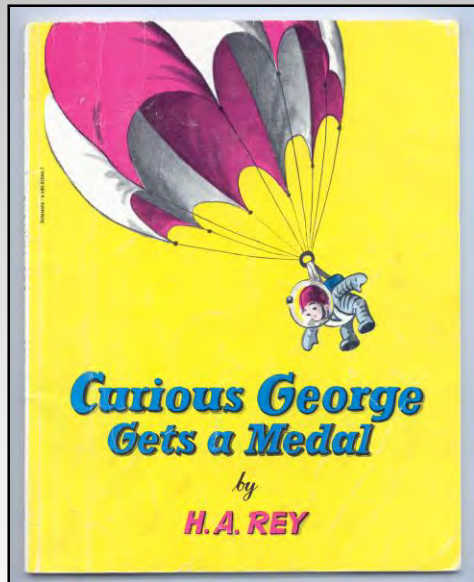
1. listen for the endings
2. identify the endings in print
3. read words with the endings
4. write words and sentences with the endings
5. add the right ending on to fit the meaning of a passage
6. use words with endings in own writing

wiped
discovered
reminded
frightened
watched
enchanted
forested
picnicked

Instructional Goal:

- Accuracy of sound and symbol identification
- Accuracy at syllable, morpheme, and whole word levels
- Speed and automaticity – word recognition without conscious attention
- Reading passages fluently for meaning and enjoyment

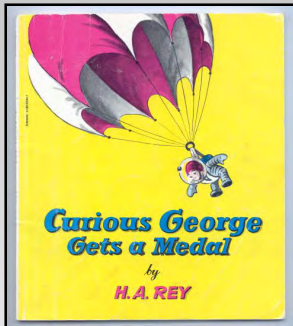
Reading Aloud to Your Child Builds His Vocabulary



Sample Vocabulary Words in <i>Curious George Gets a Medal</i>		
<i>Scenes at the House</i>	<i>Scenes at the Farm</i>	<i>Scenes at the Spaceship</i>
<ul style="list-style-type: none">• curious• fountain pen• funnel• blotter• garden hose• tap• lather• escape• portable pump	<ul style="list-style-type: none">• shed• loop• hurled• latch• grunting• squealing• grazing• rattling	<ul style="list-style-type: none">• professor• flash• signal• bail out• emergency rockets• permit• space suit• launching site• lever• groping• parachute

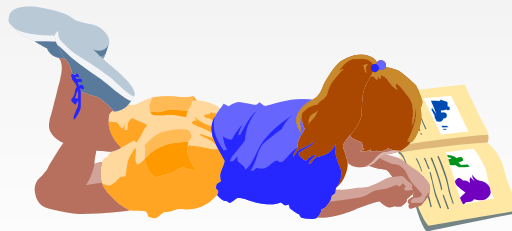
A Child with a Large Vocabulary has an Advantage in Learning to Read

He learns the word while listening to the story...



“When we flash you a signal you will have to open the door and bail out with the help of emergency **rockets.**”

...Then your child can more easily sound out the word if it is part of his listening and speaking vocabulary.



rock-ets

Most Children Can Learn to Read

- Incidence of “below basic” reading was 5% in the 1st grade regular classrooms where the code-based program was well implemented; very few children had severe reading problems (NICHD Early Interventions Project, Washington, DC)



Good Programs and Approaches

- Orton-Gillingham
 - Wilson Language
 - Alphabetic Phonics
 - Phonographix
 - SpellRead P.A.T.
 - Spalding: Writing Road to Reading
 - Lexia Learning Systems
 - Slingerland
 - Lindamood-Bell
 - Project Read
 - LANGUAGE!
 - REACH – Direct Instruction
 - ReadWell, SpellWell
 - Watchword
-

Education of Educators

- Structure of language
- Language development and issues in second language learning
- Psychology of reading acquisition
- Use of screening, progress-monitoring, and diagnostic assessments to inform instruction
 - Familiarity with lower incidence handicapping conditions
 - Internship in teaching a structured language approach with students of different disability profiles

An Achievable Goal



Almost every child with reading difficulty will progress yearly in relative standing, as a consequence of early, expert, intensive, collaborative intervention based on an understanding of best practices supported by research.

Resources

Organizations and Web sites



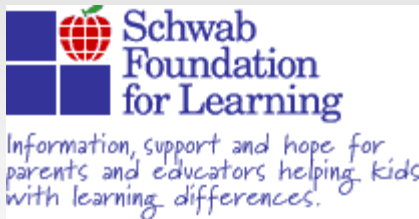
- **International Dyslexia Association (IDA)**
 - (410) 296-0232 or (800) ABC - D123
 - www.interdys.org



- **Web site of Coordinated Campaign for LD**
 - **ldonline.com**



- **Learning Disabilities of America (LDA)**
 - (412) 231-1515



- **Schwab Foundation for Learning**



Straight Talk About Reading Website

www.ProActiveParent.com

Acknowledgements

- Some material in this presentation was derived from presentations by my colleagues:
 - Lyon et al., 2000 at the Fordham/PPI Conference
 - Fletcher et al., 2001 at the OSEP LD Summit (www.air.org/ldsummit), and
 - testimony by D.J.Francis for the President's Commission on Excellence in Special Education
 - Susan Hall, of Straight Talk About Reading and Parenting a Struggling Reader