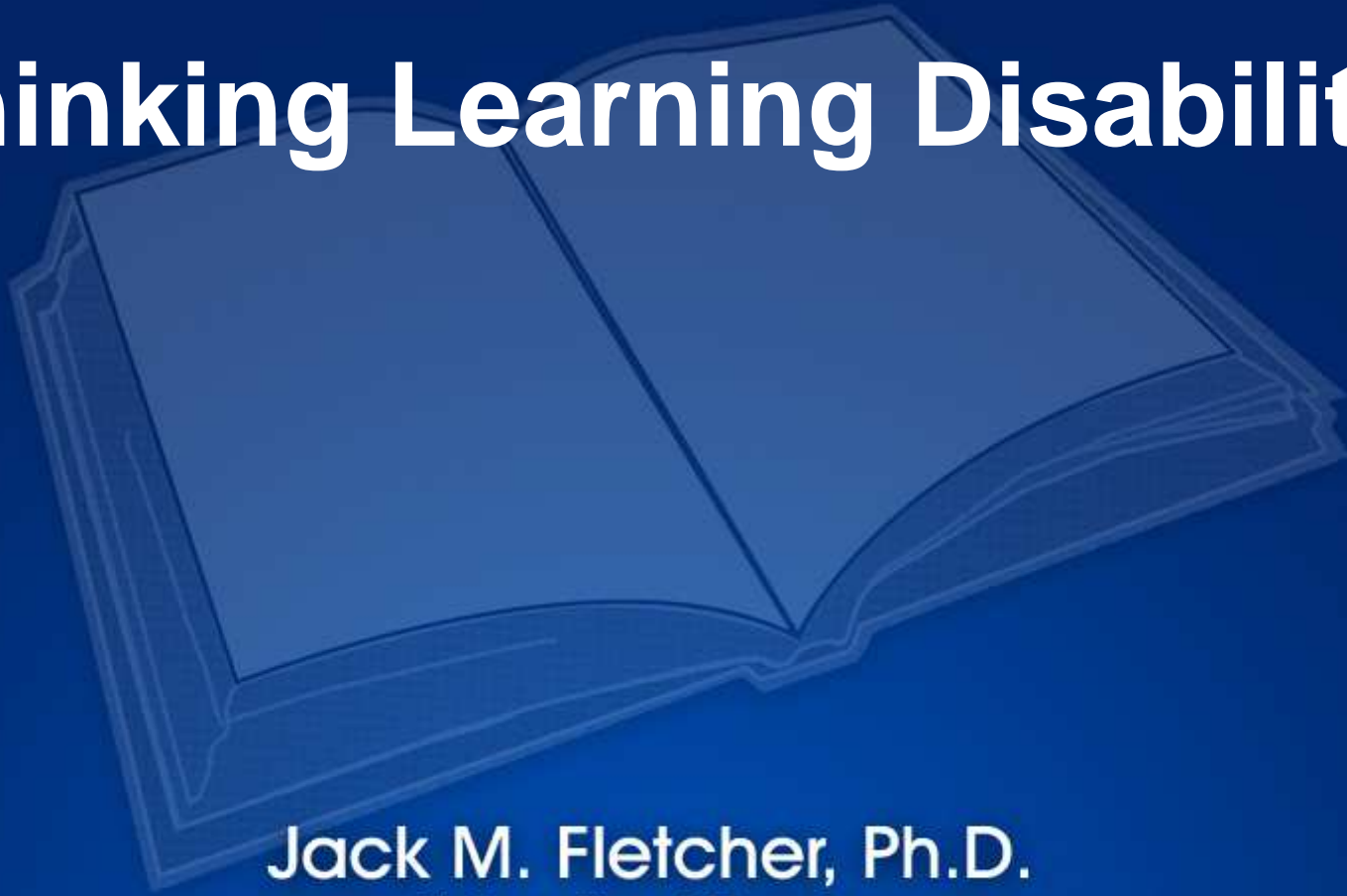


Rethinking Learning Disabilities



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Presentation to HAEYC. March 11, 2008

What are Learning Disabilities ?

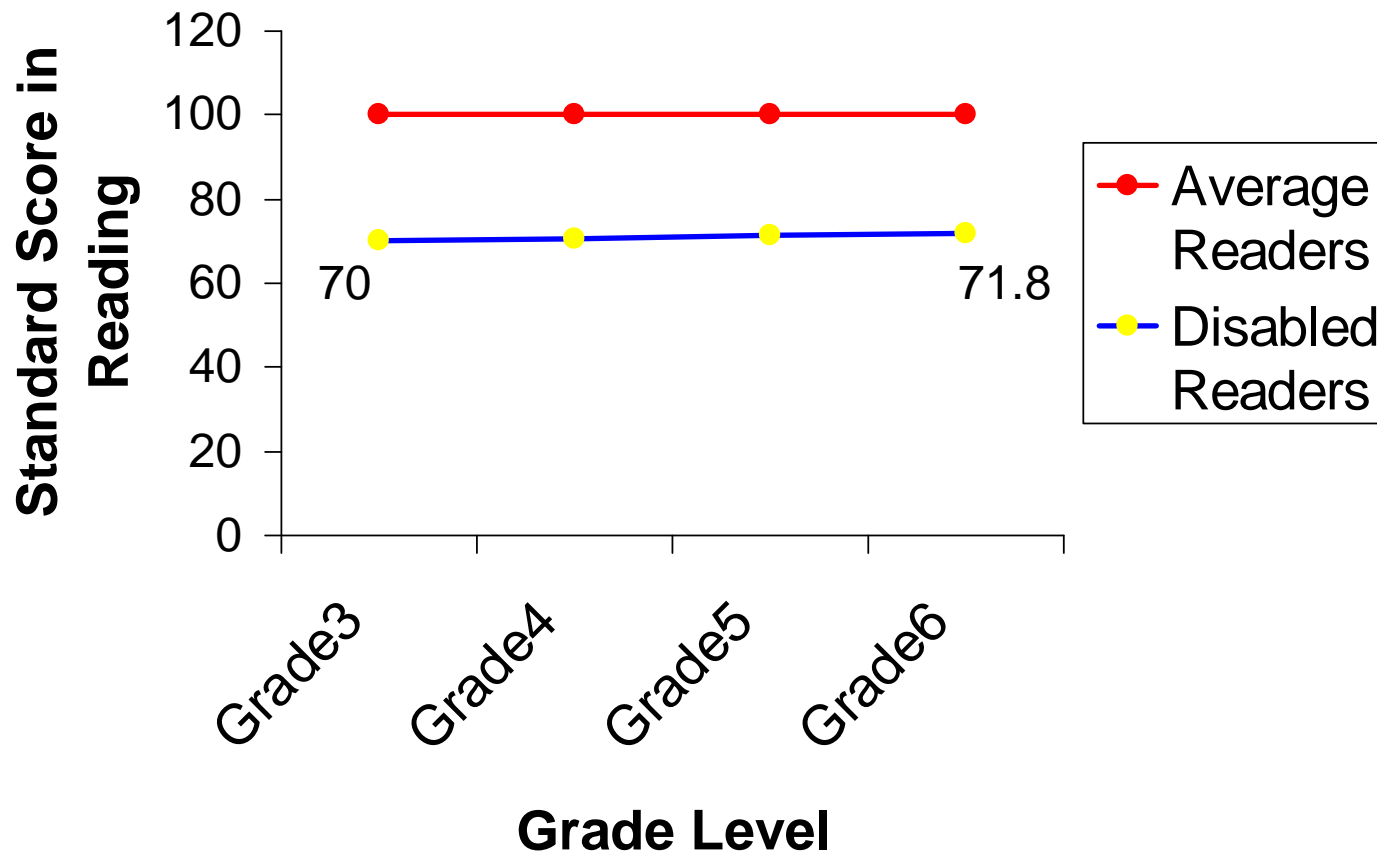
- All disabilities have biological and social realities that vary with “disorder” and “person”
- Learning disabilities are dimensional-variation on normal development
- Model is obesity or hypertension, not measles and mumps- quantitative disorders with variable expression in reading, math, and written expression
- Prevent or remediate? Risk or deficit?

Why prevent? Remediation alone can't fix reading problems

- Number of children identified as LD in special education has increased dramatically since 1975
- Half of the 6.2M children identified for special education- 6% of all children in schools
- 80- 90% identified for reading disabilities (up to 40% of all in special ed)
- IDEA 2004 moves toward NCLB with its focus on EIS, RTI, and “lack of appropriate education in reading or math”
- **General education and special education (and other programs) must work in concert**

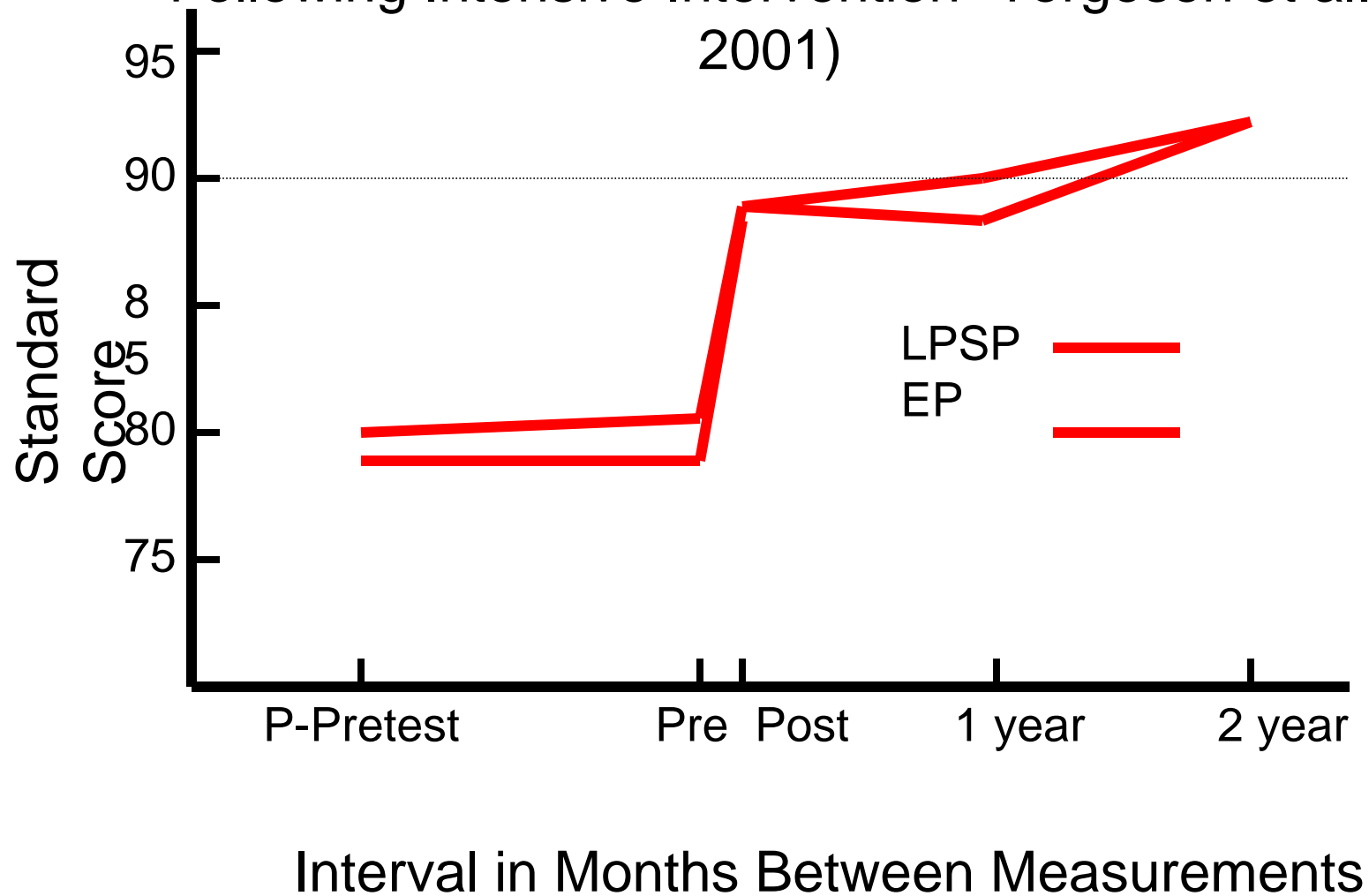
Special Education Alone is not Sufficient

Change in Reading Skill for Children with Reading Disabilities in Special Ed : .04 Standard Deviations a Year

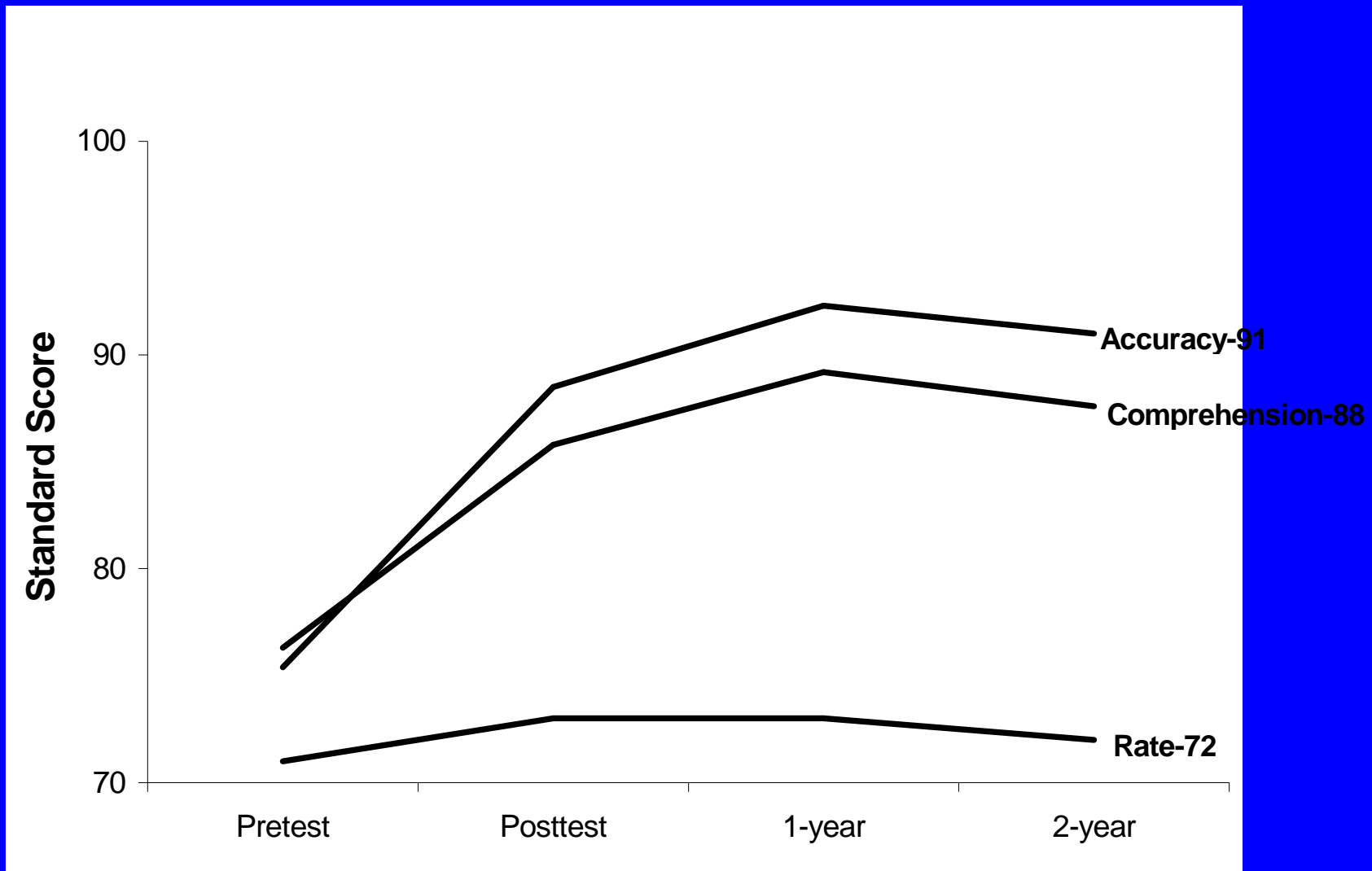


Remediation Requires Intensity

Growth in Total Reading Skill Before, During, and Following Intensive Intervention- Torgesen et al. (2001)



Reading fluency remained quite impaired (Torgesen, 2001)



Remediation is an incomplete solution!

Reading rate is limited because the proportion of words in grade level passages that children can read “by sight” is less than for average readers (Torgesen et al., 2001).

Fluency depends on practice (repeated exposure to letter patterns).

How do you close the gap when the student is already 3- 5 years behind?

Early Intervention is Possible

- Risk characteristics present in Kindergarten and G1
- Assess all children, monitor progress, and INTERVENE- first in the classroom and then through supplemental instruction
- Screening measures for reading, math, and behavior

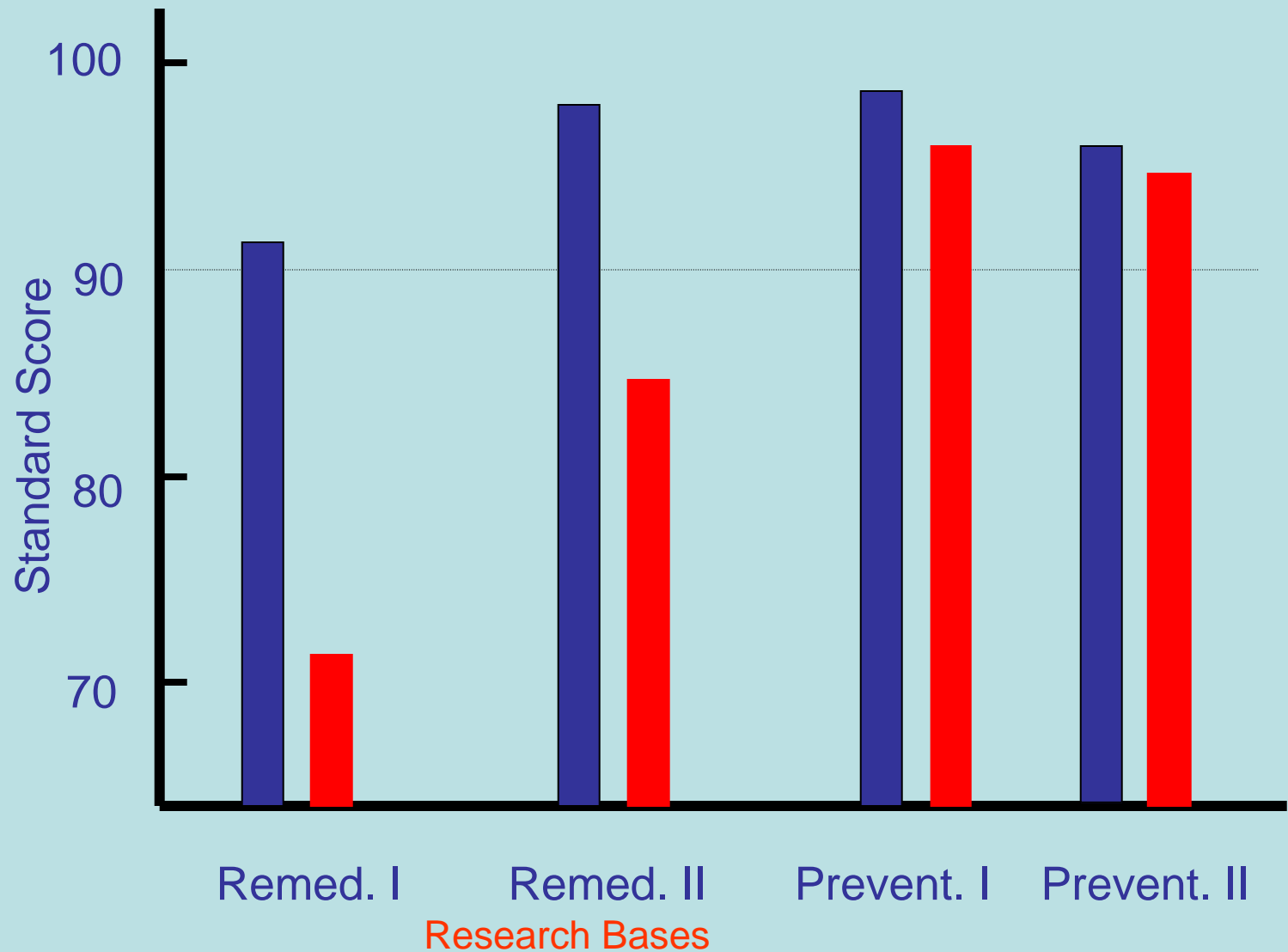
Early Intervention is Effective

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



Courtesy Carolyn Denton

Differences in Outcomes for Basic Reading Skills and Rate in Prevention vs. Remediation Studies



Early Intervention Doesn't Work for Every Student

- Even the very best prevention programs leave behind 2-10% of the school population
- Need to reduce the numbers in order to effectively implement remedial programs

- **How do we connect prevention and remediation?**

Link general education and special education through multi-tiered instruction and RTI

Three Tier Model for Academic and Behavioral Outcomes (NADSDE, 2006)

ACADEMIC SYSTEMS

TIER 3 *Intensive, Individual Interventions*

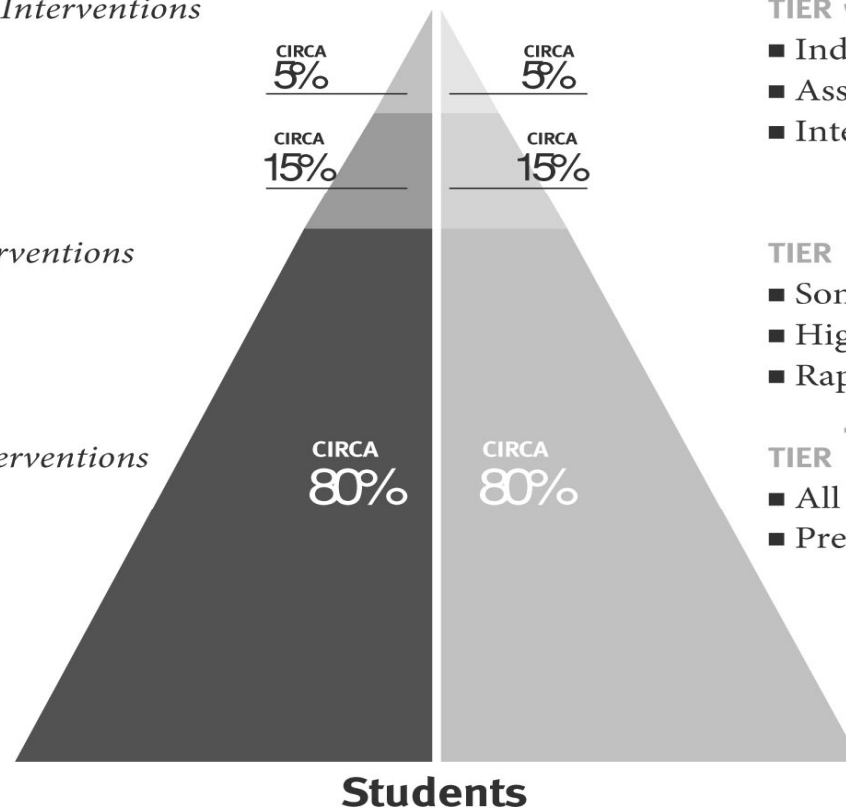
- Individual students
- Assessment-based
- High intensity
- Of longer duration

TIER 2 *Targeted Group Interventions*

- Some students (at-risk)
- High efficiency
- Rapid response

TIER 1 *Core Instructional Interventions*

- All students
- Preventive, proactive



BEHAVIORAL SYSTEMS

TIER 3 *Intensive, Individual Interventions*

- Individual students
- Assessment-based
- Intense, durable procedures

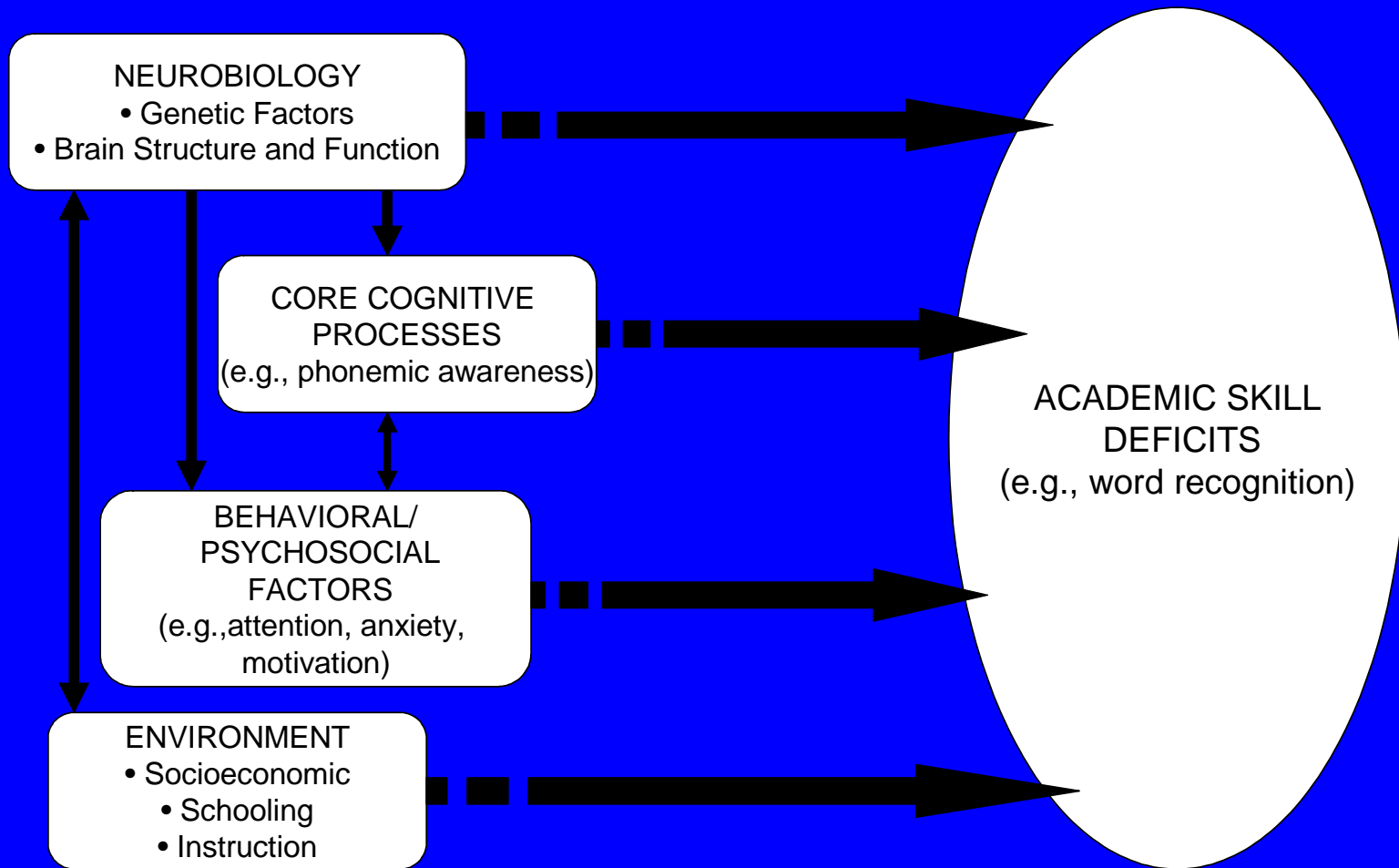
TIER 2 *Targeted Group Interventions*

- Some students (at-risk)
- High efficiency
- Rapid response

TIER 1 *Core Instructional Interventions*

- All settings, all students
- Preventive, proactive

A Model of LD (Fletcher et al., 2007)



Neurobiological Factors

- Reading, math, and writing are heritable traits
- In reading, heredity accounts for 50- 80% of variance in outcomes
- No genes specific to poor development (e.g., no dyslexia genes)
- Strong understanding of neural systems
- Field is moving away from “bad- gene, bad brain” theory to the idea of genes that make brains at risk and risk is modified by environment
- No simple biological test for LD

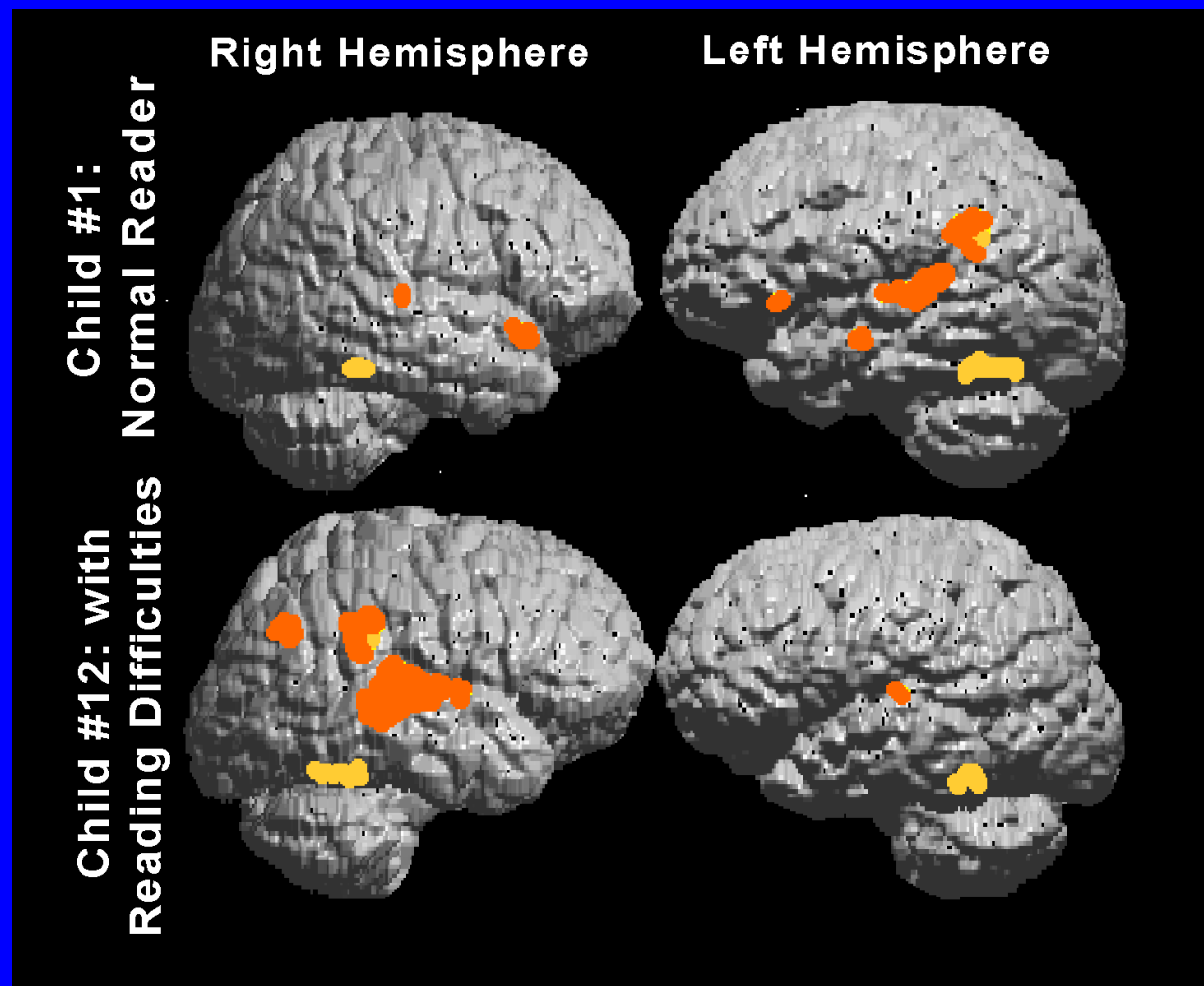
Environmental Factors

- Home environment and quality of language
- Socioeconomic factors: parental education, poverty
- Quality of instruction (schools, teachers)
- No simple behavioral or environmental test for LD

Center for Clinical Neuroscience- Papanicolaou



Neural Signature of Reading Disability (Papanicolaou)



Neural Response to Intensive Intervention

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

8 children with severe dyslexia

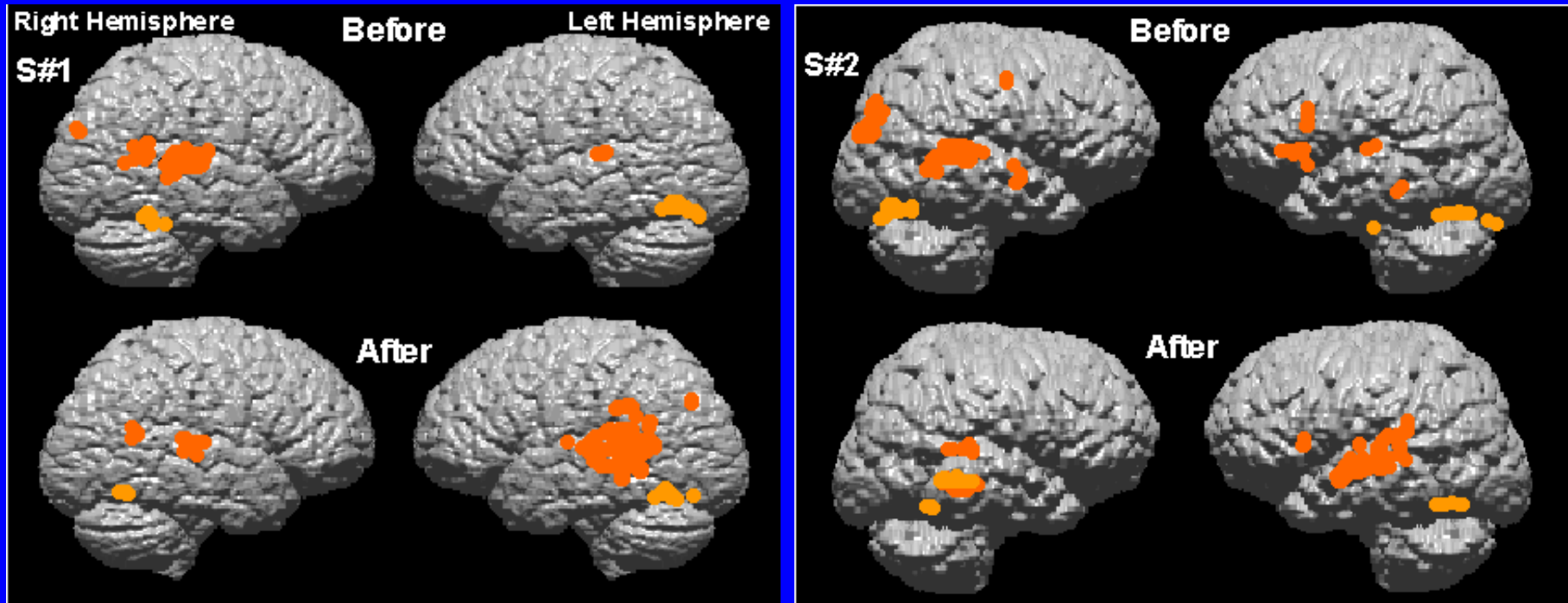
8 week intense phonologically- based intervention
(2 hours a day= up to 80 hours of instruction)

Simos et al., *Neurology*, 2002

Demographic Information

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 Brain on Reading!



Early Development of Reading Skills: A Cognitive Neuroscience Approach

(Jack M. Fletcher – PI)

Grade I Multi-tiered Intervention

Patricia Mathes and Carolyn Denton - P1:
Early Reading Intervention (Mathes et al.,
RRQ, 2005)*

Andrew Papanicolaou - P2: Brain Activation
Patterns (Simos et al., Neuropsychology,
2005; JLD, in press)

*Albert J. Harris award, IRA, 2006



The Interventions

Enhanced Classroom Instruction

- District provided extensive professional development and new materials
- All children identified as at-risk for principal, teachers, and parents
- Progress monitored with feedback to principal, teachers, and parents

Supplemental Instruction

- Some children also received an additional 40' of daily small group instruction for 30 weeks using one of two comprehensive reading programs constructed using different philosophies
- A small group received intensive intervention

What percentage of children don't respond adequately to quality intervention?

Primary only: 15/92 = 16% (3.2% of school population)

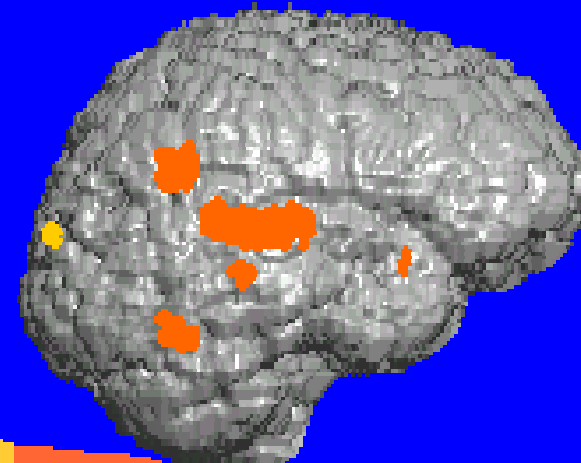
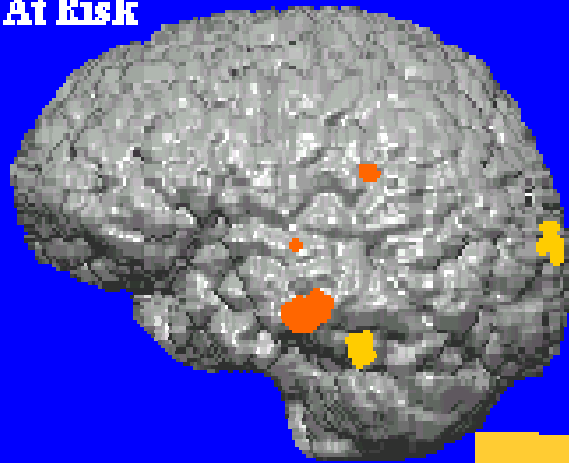
Primary + Secondary:

- **7/163 = 4% (<1% of school population)**

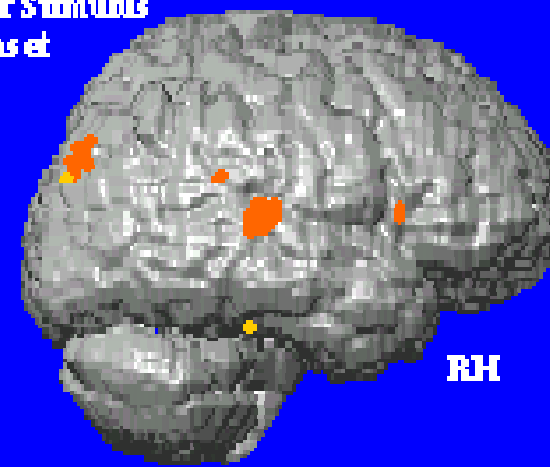
(Woodcock Basic Reading < 30th percentile)

Early Detection of Aberrant Brain Activation Profiles for Reading (end K)

At Risk



Not at Risk



150-300 300-1000 ms
Time after Stimulus
ms et

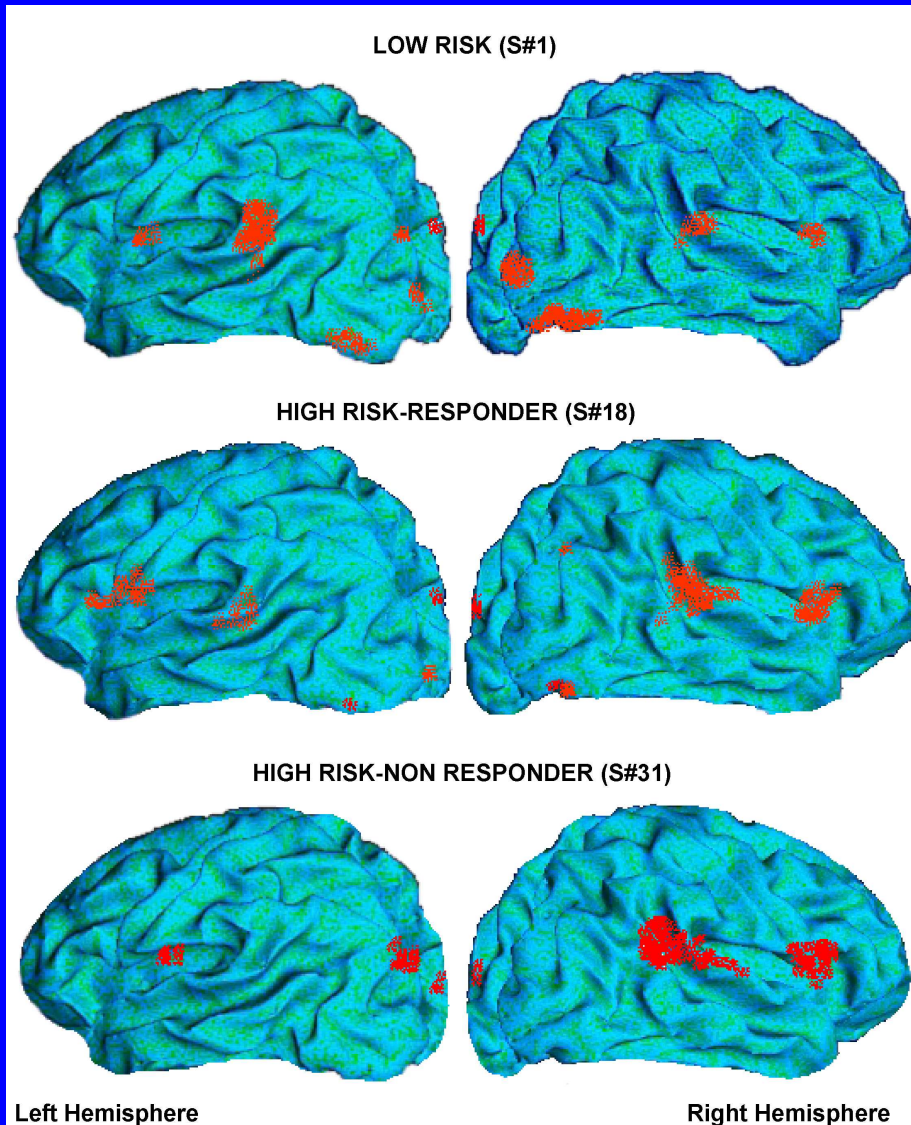
LH

RH

N= 45 children 6 yrs old

Simos et al., J Child Neurol, 2002

Grade 1 Intervention



Simos et al.
(Neuropsychology,
2006)- after Grade
1 intervention in
Mathes et al.
(RRQ, 2005)

IDEA 2004: RTI **or** Discrepancy?

- (2)(i) The child does not make sufficient progress to meet age or State-approved grade-level standards in one or more of the [8 domains of achievement] when using a process based on the child's response to scientific, research-based intervention; **or**
- (ii) The child exhibits a pattern of strengths and weaknesses in performance, achievement, or both, relative to age, State-approved grade-level standards, or intellectual development, that is determined by the group to be relevant to the identification of a specific learning disability, using appropriate assessments, consistent with §§300.304 and 300.305;

IDEA 2004: Inadequate instruction is an exclusion

To ensure that underachievement...is not due to lack of appropriate instruction in reading or math, the group must consider, as part of the evaluation described in §§300.304 through 300.306—

- (1) Data that demonstrate that prior to, or as a part of, the referral process, the child was provided appropriate instruction in regular education settings, delivered by qualified personnel; and
- (2) Data-based documentation of repeated assessments of achievement at reasonable intervals, reflecting formal assessment of student progress during instruction, which was provided to the child's parents.

IDA DEFINITION OF DYSLEXIA

Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often **unexpected** in relation to other cognitive abilities and **the provision of effective classroom instruction**. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

Adopted by the Board of Directors: November 12, 2002

Who is LD?

- The student who does not respond to quality instruction: **hard to teach, not unable to learn**
- Low achievement AND inadequate instructional response
- Often preventable (K-2) with early intervention
- Requires closer integration of general education and special education
- Results are more important than process



Learning for SUCCESS
www.texasldcenter.org

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



Process becomes less important if there is accountability for results:
Prevent disabilities through effective instruction

Funded by the National Institute of Child Health and Human Development (NICHD) and the Texas Education Agency

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