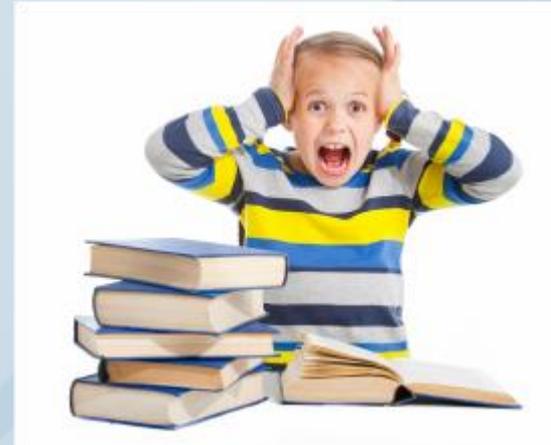


Overview

Academic success can be predicted with reasonable accuracy based on knowing a student's reading skills at the end of 3rd grade.

Children who fall behind in first grade have a 1 in 8 chance of ever catching up without extraordinary effort.

74% of children who are poor readers in third grade remain poor readers in ninth grade.



Causes of Poor Reading

- Neurological
- Familial
 - Genetic (Dyslexia)
 - Economic
 - ELLs
- Inadequate Instruction
- Combination



Genetic Factors of Dyslexia

- Markers on Chromosomes 1,2,3,6,15,and 18
- Genes have been identified as being involved in a number of reading-related processes, but no gene specific to poor reading.
- About 50% of the variability is explained by genetics.
- Environment accounts for the other 50%

Genetic and Environment Factors

- Genetics predispose children to dyslexia.
- Dyslexia is a word-level reading problem.
- The child's environment determines how severely genetics impact the child's experience with dyslexia.
- **INSTRUCTION** is the most important environmental factor.

NEURAL PLASTICITY AND LEARNING TO READ

Oral language is a natural process.

Reading is not a natural process and is not constructed as a result of exposure to language.

The process of learning to read requires a neural reorganization of the brain. Brain circuits designed for oral language must re-wire neurons in order to read.

The structure and transparency of the language interacts with the brain's ability to learn to recognize words automatically.

Reading instruction is always brain-based and is involved in the development of reading proficiency.



A brief look at the brain

Left hemisphere – processes factual, sequential- explicit processing e.g. language

Right hemisphere – big picture, implicit processing – inferential

Corpus Colossum – connects LH with RH

Central Sulcus – divides frontal cortex and posterior lobe

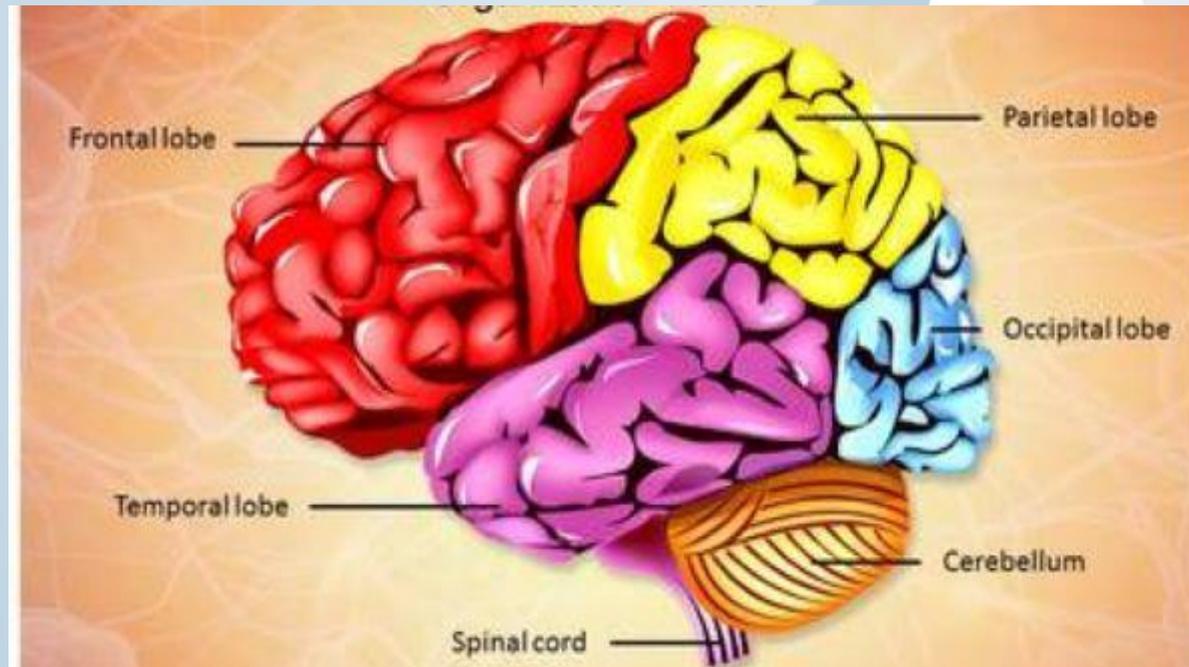
Frontal cortex – outputs, attention, working memory, self-monitoring

Posterior lobes – inputs

Temporal – auditory information

Occipital- visual information

Parietal – perception of movement, orientation, spatial information.



A lot can go wrong

Occipital-temporal convergence

letter-box, orthographic storage- whole words, phonics.

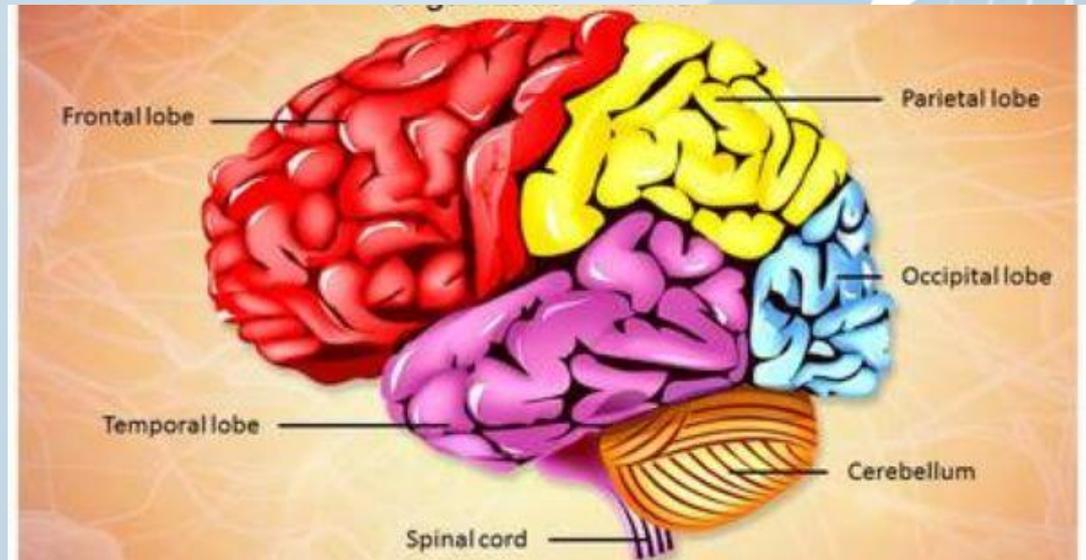
Temporal-parietal convergence

Wernicke's area – letters and sounds are linked. Phonological processing, phonemic processing.
semantic processing – meaning.

Broca's area – back of the frontal lobe
Expressive language.

Wernicke and Broca connected by arcuate fasciculus.

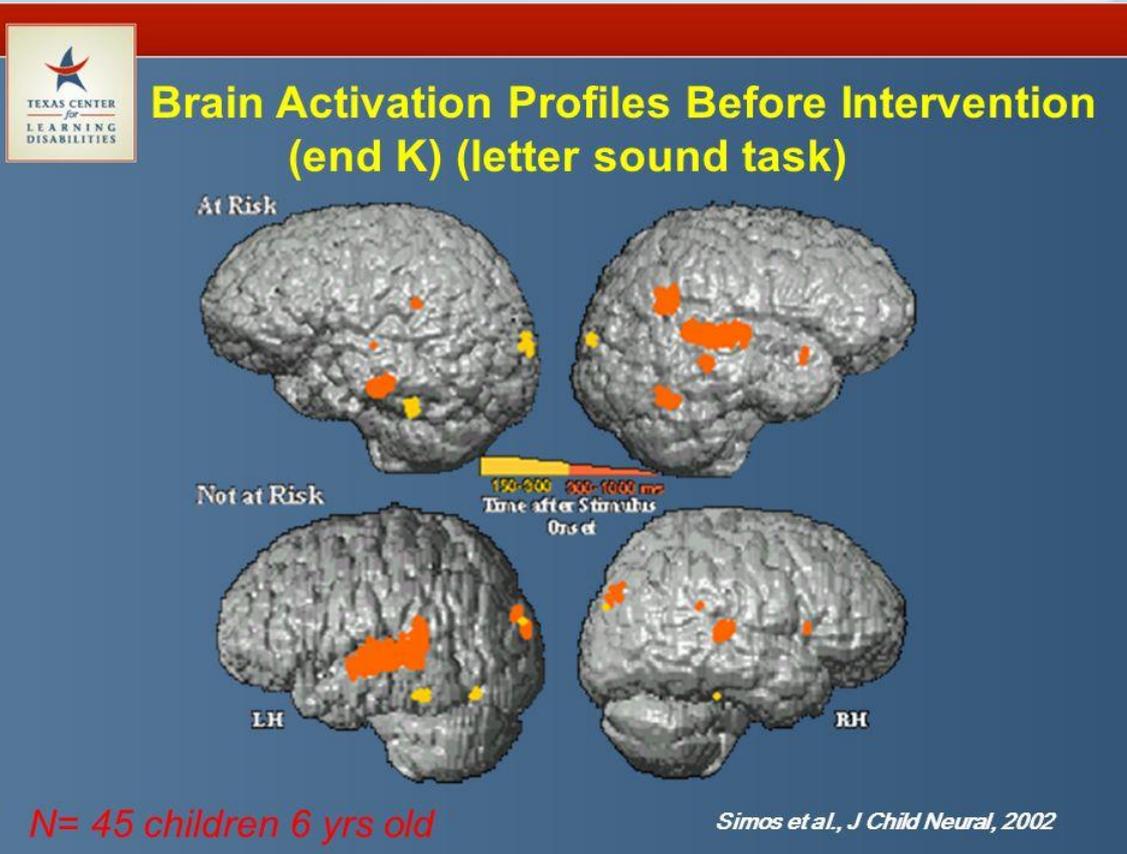
Pre-frontal cortex – attention, executive functioning

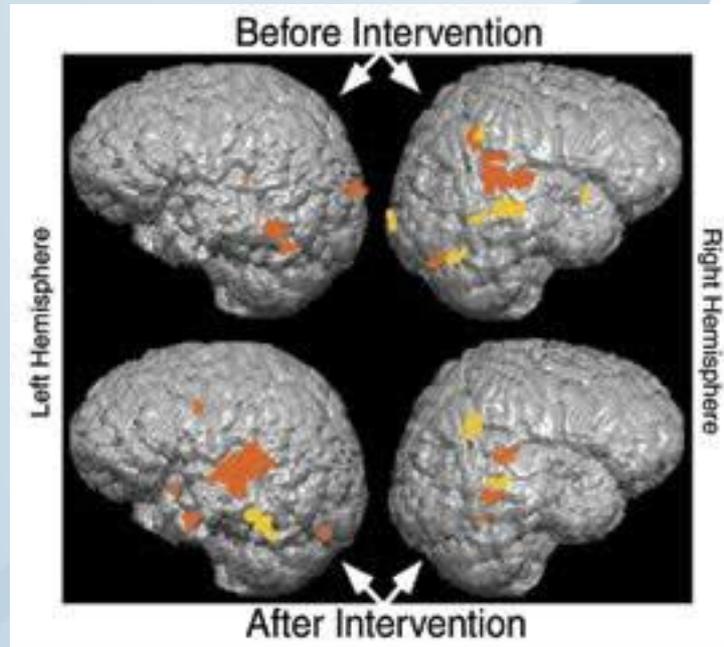




Compensatory or normalizing changes ?

Reading instruction affects brain structure and function !





Intervention normalizes brain activation patterns

Instruction helps normalize the reading brain.

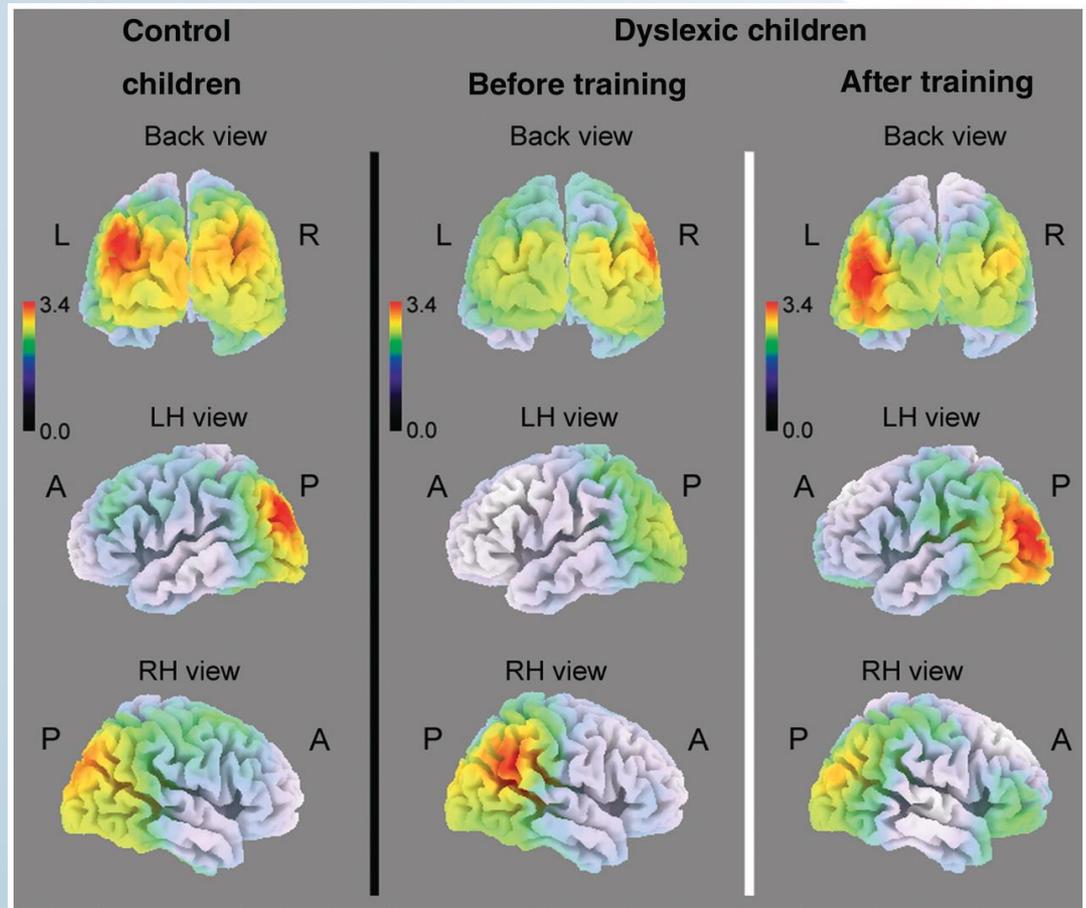
Intervention with very young children shows that they look very much like their peers.

They have not had the chance to fall behind.

Older children also show “normalization” with intervention.

These children will not be performing the same as their peers, because they have a gap in their background knowledge.

They have not had the same practice as their peers.



RAN/RAS-beyond phonemic awareness

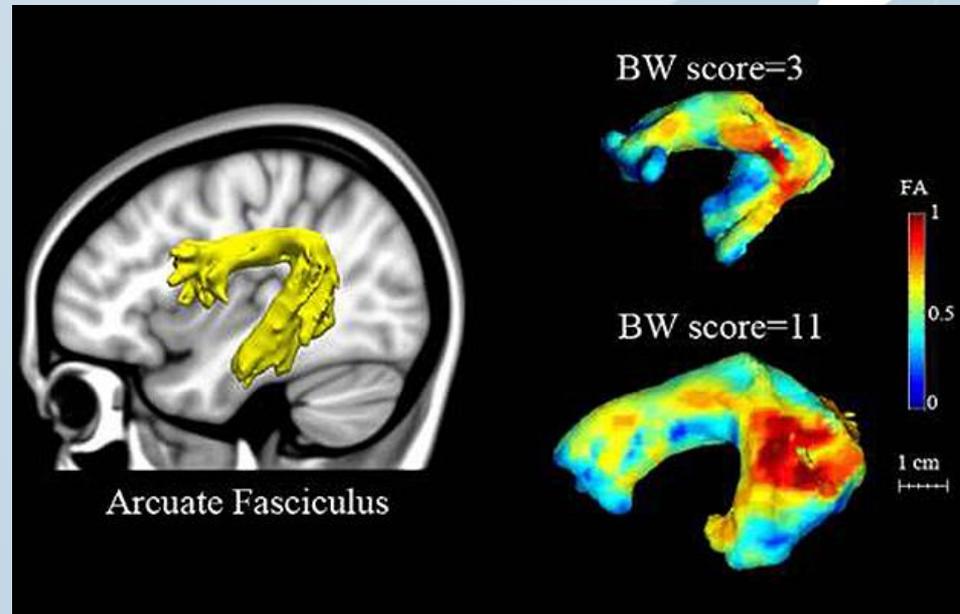
RAN and phonological processing assessments are both excellent predictors of reading ability.

Problems with RAN are early indicators of fluency problems.

Intervention should include fluency tasks.

RAN task difficulties combined with phonemic awareness difficulties often indicate a more severe form of dyslexia.

Before a child is able to read connected text, RAN is the best predictor of dysfluency.



Importance of early intervention

Children with a genetic predisposition for dyslexia will respond positively to scientifically validated intervention.

HOWEVER, once a child experiences failure, a whole set of additional obstacles begin to appear.

social-emotional problems

missed learning opportunities

lowered expectations

difficulty catching up with peers



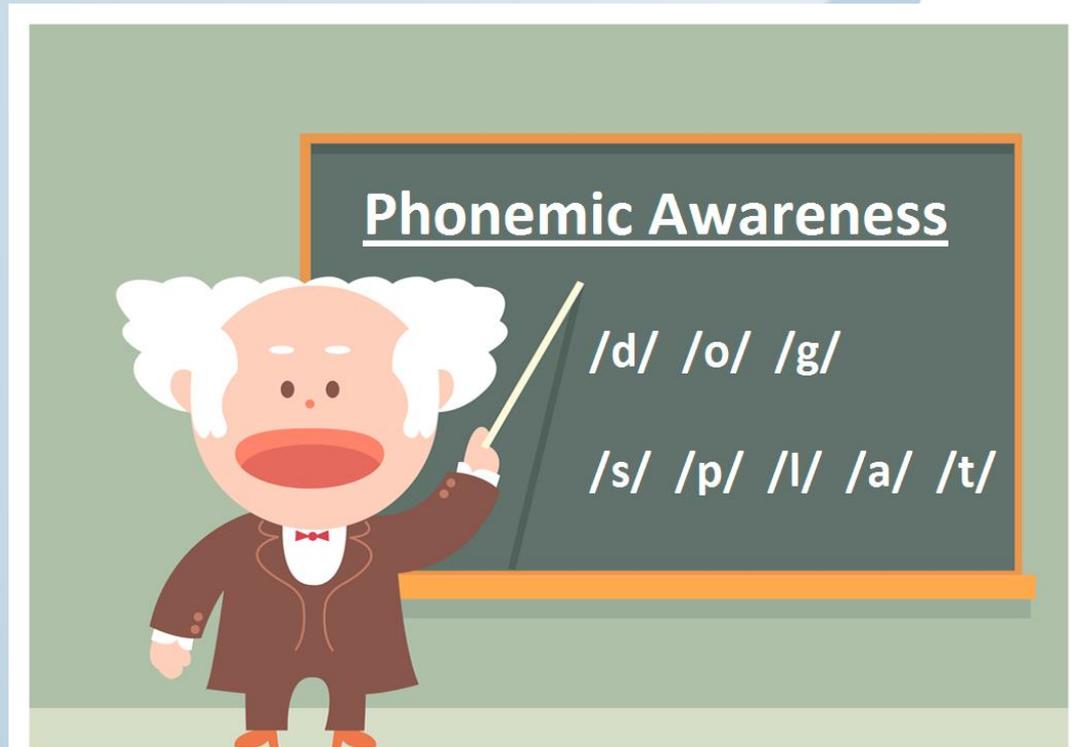
AGE MATTERS

Early intervention using appropriate instruction is the key

By providing intensive intervention BEFORE failure has occurred, much of the struggles attributable to dyslexia can be avoided.

At-risk children who learn to read at normal levels by then end of first grade continue to perform at normal levels across the grades.

Children who do not reach normal reading levels by the end of first grade have a 1 in 8 chance of ever catching up.



Assessment of Risk

Pre-K & Kindergarten

- Phonological assessment
 - rhyming
- Phonemic Awareness
 - 1st sound isolation
 - blending
- Letter knowledge
 - Letter names
- Rapid naming known objects and or colors

1st grade

- Phonemic Awareness
 - 1st sound isolation
 - Blending tasks
 - Phoneme segmentation
 - Elision
- Letter knowledge
 - Letter names
 - Letter sounds
- Rapid naming of known objects, colors, numbers, and/or letters

Effective Intervention

phonemic awareness, phonics, fluency, vocabulary, comprehension

- Teaches children to become sensitive to the sounds they hear in words –(phonemic awareness)
- Teaches children how the sounds they hear correspond with printed words (phonics)
- Teaches the six syllable types and four syllable division patterns. (esp. important for multi-syllable words.)
- Moves quickly from sound-symbol recognition to word building
- Incorporates vocabulary and comprehension strategies from the beginning (syntax, semantics, morphology).
- Practices fluency from the beginning
- Incorporates spelling – sounds to symbols, symbols to sound
- Incorporates writing

Choosing an intervention

- Specific scope and sequence
- Introduces only one or two new concepts per lesson
- Provides extensive cumulative practice
- Speeded practice
- Integrates new content with previously learned content.
- Small groups

Archived webinars

- <http://readingmatterstomaine.org/videos/>
 - Reading and the Brain – Dr. Chris Kaufman
 - Phonics in the Classroom – Dr. Lexis Kiburis, Dr. Eileen Harris
- Synthetic phonics
- <https://www.youtube.com/watch?v=kaGMRF0OyJo>
- <https://www.youtube.com/watch?v=Mcg1hwZsKU0>

Acknowledgements

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