Curing Dyslexia: What is Possible?

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Causes of Poor Reading

- Neurological
- Familial
    - Genetic (dyslexia)
    - Economic disadvantage
    - Linguistic diversity
- Instructional (Dysteachia)
- Combination

Genetic Factors of Dyslexia

- Sites on chromosomes 1, 2, 6, 15, -6 and 15 replicated.

- No evidence for genes specific to poor reading.

- Only 50% of the variability explained by genetic factors.

- The environment accounts for the other 50%.

From Genotype to Phenotype

- Genetics predispose a child to dyslexia, a word level reading problem.

- The environment determines how severely the child will experience dyslexia.

- Instruction is the most important environmental factor.

Dyslexia and and Neural Plasticity

- Reading is not a natural process and is not constructed as a result of simple exposure to language or words.

- The process of learning to read rewrites the organization of the brain.

- 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 involved in the development of reading proficiency.

The relation of reading instruction and brain structure and function?

Compensatory or normalizing changes?
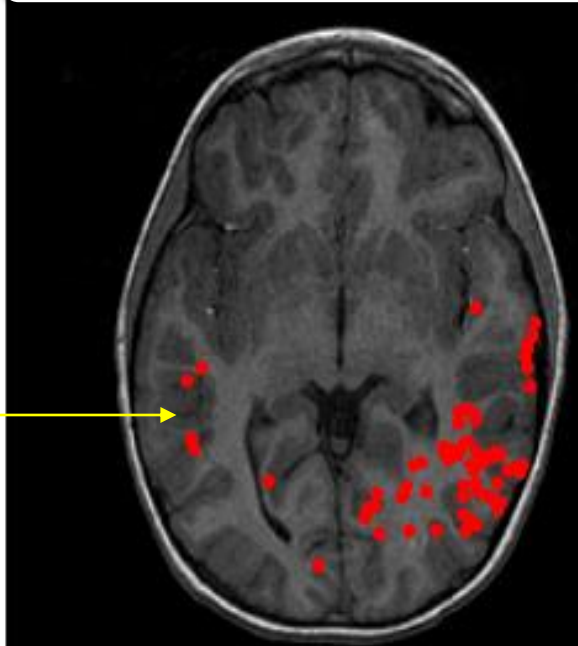
Normal vs. Dyslexic Brains
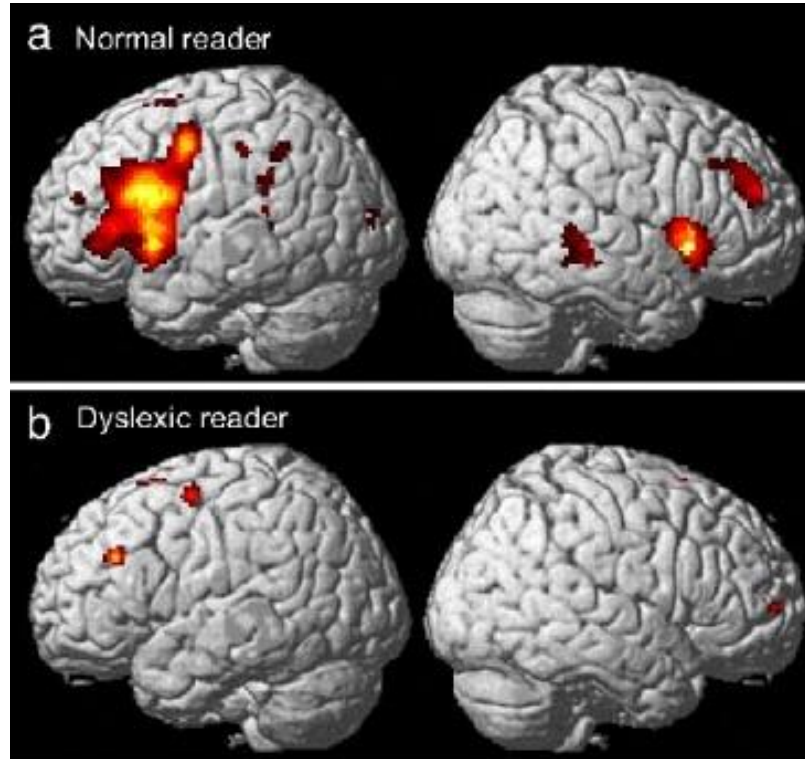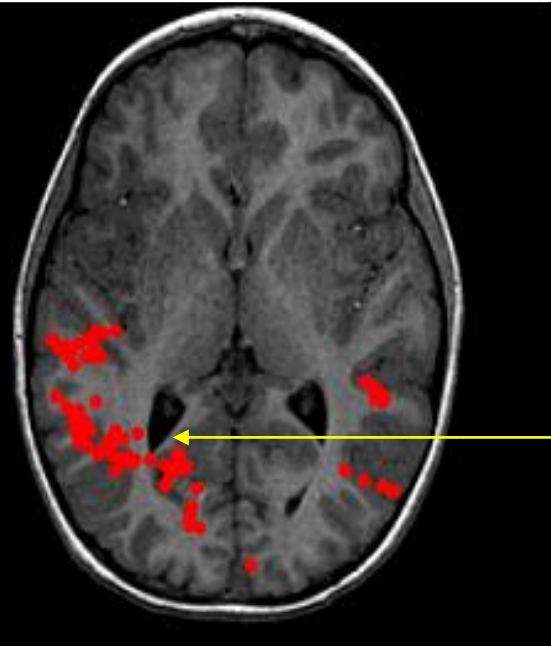
5 Year Olds Before Learning To Read

At-Risk | Normal

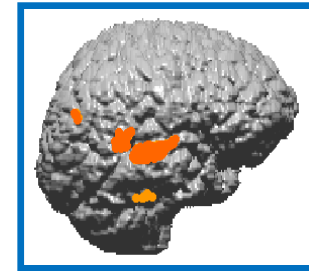Little activity in left hemisphere

Normal left hemispheric activation

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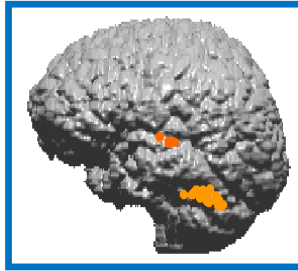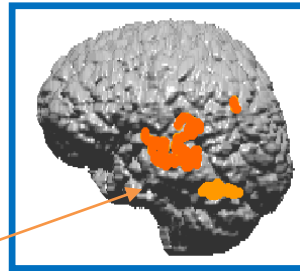Hoot Education

Intervention Normalizes Brain Activation Patterns

Before Intervention

After Intervention

normalized

Left
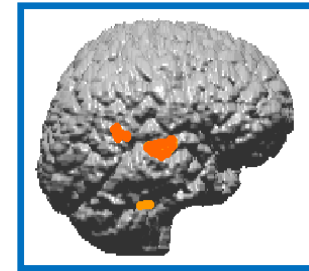
Right

Activation patterns of older children

Normal

Dyslexic

Pre-intervention   Post-Intervention
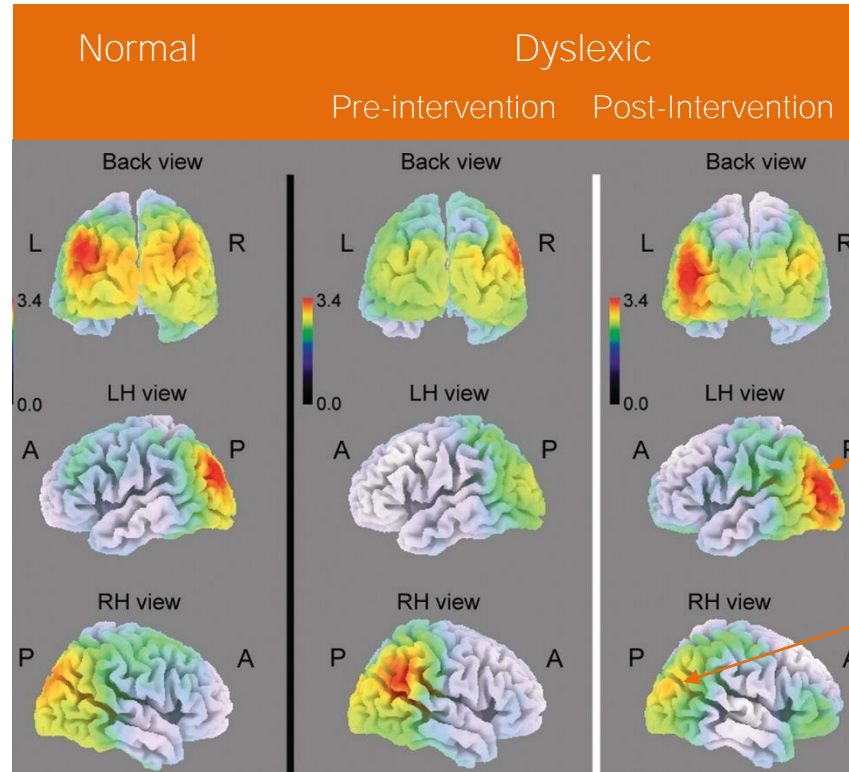
Normal left hemispheric activation

Right hemisphere also normalizes

Importance of Intervention

- Intervention can normalize location of brain activation.

- Even so, there is often ongoing latency.

  - Latency is expressed as dysfluency.

- Intervention that includes early fluency work results in even more normalization of the brain.

Age Matters --- A Lot!

- Children who have a genetic predisposition for dyslexia will respond positively to scientifically validated intervention.

- However, once a child experiences failure, a whole set of additional issues begin to cascade.

  - Social-emotional problems.

  - Missed learning opportunities.

  - Lowered expectations.

  - Extremely difficult to catch-up with peers.

Early Intervention is the Key

- When intensive intervention is provided early, before failure has occurred, dyslexia can be largely avoided.

  - Will still need careful monitoring.

  - May struggle with spelling & organization, but so do most children!

- Children at risk for dyslexia who learn to read at normal levels by the end of first grade continue to perform at normal levels across the grades.

- Replicated finding.

Highly Effective Intervention

1. Teaches children to become sensitive to the sounds they hear in words.
2. Teaches children how the sounds they hear map onto printed words.
3. Continues through the 6 syllable types and into multisyllabic word work.
4. Moves quickly from letter-sound recognition to word building.
5. Brings in vocabulary and comprehension from the beginning.
6. Systematically works on fluency from the beginning.
7. Incorporates spelling in service to word recognition.
8. Incorporates writing in service to comprehension.

Adopt an intervention with proven effectiveness!

- Has specific scope and sequence.
- Teaches only one or two new items on any one day.
- Provides extensive cumulative practice.
- Includes speeded practice, from the beginning.
- Integrates new content with previously learned content.
- Delivered in small groups.

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Importance of Early Identification

- Can only provide early intervention if we know who is at risk for experiencing Dyslexia, if left untreated.

- Not necessary to do brain scans to determine risk.

- Typical assessment tools of early reading are very accurate.

Assessment of Risk

Pre-K & Kindergarten

- Phonological Awareness
  - Alliteration
  - Rhyming
- Phonemic Awareness
  - 1st sound isolation
  - Blending tasks
- Letter-Knowledge
  - Letter-Names
- Rapid Naming of Objects and/or Colors

First Grade

- Phonemic Awareness
  - 1st sound isolation
  - Blending tasks
  - Phoneme Segmentation
  - Elision
- Letter-Knowledge
  - Letter-Names
  - Letter Sounds
- Rapid naming of known object, colors, digits, and/or letters.

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Teachers and Administrators Need Support

Personalized Learning
- Coach selected learning modules for teachers.
- Coach organizes teachers into study groups based on their shared needs.

Coaching
- Data analysis.
- Classroom observations.
- Face-to-face problem solving.
- Interactive workshops.

Community
- Teacher profiles.
- Discussions.
- Challenges:
  - Teachers post challenges.
  - Peers give support.
- Success Stories:
  - Teachers post successes.
  - Peers give awards.

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IDA Resources

- **Early Identification and Treatment of Dyslexia: A Brain-based Perspectives** -- A recent issue of **Perspectives on Language and Literacy** that provides a brain-based perspective on the early identification and treatment of dyslexia.

- **Effective Reading Instruction** -- A fact sheet describing the components of Structured Literacy instruction.

- **IDA Fact Sheets** -- Convenient, professionally reviewed materials designed to improve understanding and support advocacy initiatives. Fact sheets are frequently used to enrich and supplement IEP meetings, school board discussions, and district policy initiatives.

- **Annals of Dyslexia** -- An interdisciplinary, peer-reviewed journal dedicated to the scientific study of dyslexia.

- **Perspectives on Language and Literacy** **--** A quarterly publication featuring articles for educators and other professionals dedicated to the identification and intervention of dyslexia and other related learning differences.

- **Examiner** **--** **A** monthly e-letter reporting on dyslexia and literacy-related events and information in the field and around the world.

- **Basic Facts about Dyslexia** -- A book by Louisa Moats and Karin Dakin distilling the most significant research in the field.

- **Expert Perspectives** **--** collection of articles by leading authorities on dyslexia and other reading problems (available from www.dyslexiaida.org)

- **Knowledge and Practice Standards for Teachers of Reading** -- standards for classroom educators and dyslexia specialists that define what all teachers of reading need to know to teach students to read proficiently.

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