Dyslexia and the Construction of the Reading Brain

The Illiteracy Epidemic

- Only 36% of U.S. children read proficiently by the end of third grade (NAEP 2015)
- “By 2020, all Georgia children will be on a path to reading proficiently by the end of third grade.” (Gov. Nathan and First Lady Sandra Deal, Get Georgia Reading)
# Fourth Grade Reading Proficiency Levels (NAEP, 2015)

<table>
<thead>
<tr>
<th>Group</th>
<th>Proficiency</th>
<th>Below Basic Proficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>46%</td>
<td>21%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>46%</td>
<td>21%</td>
</tr>
<tr>
<td>African American</td>
<td>49%</td>
<td>18%</td>
</tr>
<tr>
<td>Ineligible for Lunch</td>
<td>52%</td>
<td>17%</td>
</tr>
<tr>
<td>Eligible for Lunch</td>
<td>44%</td>
<td>21%</td>
</tr>
</tbody>
</table>

Legend:
- Blue: Proficiency
- Yellow: Below Basic Proficiency

# A View of Atlanta

**Socioeconomic Map**

**Literacy Map**
The Atlanta Speech School

- **4 Schools**
  - Hamm Center
  - Kenan Preschool
  - Stepping Stones
  - Wardlaw School

- **5 Clinics**

- **Rollins Center & Cox Campus**
  - 21,000 educators reached
  - Approx. 230K students reached
  - Members in 48 states, 24 countries

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**Construction of the Reading Brain**

**Expanding: Age 8-End of Life**
Read to Learn/for Knowledge; Build Syntax and Vocabulary Complexity and Volume (min 4000 words per year); Develop Complex Written Language; Use Language to Integrate Knowledge, Ideas, Emotions, and Actions

**Teaching & Monitoring: Age 5-8 (K-3rd Grade)**
Learn to Read through explicit instruction in Phonemic Awareness, Phonics, Vocabulary, Fluency, and Comprehension in School Ecosystem of Listening, Respect, and Self-Regulation

**Preparing: Last Trimester-Age 5**
30,000 Loving Words a Day from Parents, Serve and Return (Jack Shonkoff – Harvard), Narration/Play by Play, Parentese, Phonemes, Vocabulary, Affirmation, Empathy, and Executive Function (“a History of Good Choices” – Dr. Patricia Kuhl, U. of Washington)
We now know that phonemic awareness is a language ability (Werker & Tees, 2002; Kuhl et al., 2005; Kenner et al., 2017).

Warning Signs

- Word Retrieval weaknesses may be the first indication of a problem in very young children.
- Rapid naming of objects, colors, digits, or letters requires efficient retrieval of phonological information from memory – a critical skill for reading.
- Add to that a phonemic processing weakness in the form of articulation errors or mispronunciations and you have the warning signs of dyslexia.
Call 911 when:

- a child experiences word retrieval difficulties in on-demand language and grade-appropriate decoding is difficult. (RAN)
- phonemic awareness is weaker than expected, impacting articulation, pronunciation, listening or decoding at the word level.
- a child forgets the word he has decoded and must decode the same word each time it appears on the page. (Working Memory)
- fluency or automaticity with letter names, sounds, or words is not developing as it should.
- a child is an outlier in his/her reading group/class and available support isn’t enough.
- retention is being contemplated because of reading performance.
- a child is reluctant to read.

The Dyslexic Brain in the Classroom

Dyslexia is a language-based learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities.

5–20% of the population have some of the symptoms of dyslexia, including slow or inaccurate reading, poor spelling, poor writing, or mixing up similar words.

Anatomical and brain imagery studies show differences in the way the brain of a person with dyslexia develops and functions.

If a child isn’t learning to read and assessment isn’t possible, assume the child has dyslexia and TEACH accordingly.
A Portrait of Dyslexia

- Brain processes information less efficiently
  - Activation for reading is weaker or nonexistent in areas present in typical readers.

Dyslexia is:
- a language-based learning disability
- neurobiological in nature.
- associated with difficulty in processing the orthography (the written form) and phonology (the sounds) of language
- impacted by weak rapid retrieval of letters, sounds, words, etc.
- hereditary
- impacted by the child’s ecosystem at home and at school.

Dyslexia IS NOT:
- a reversal of letters
- a visual disability
- the result of low IQ
- seeing things backwards
- outgrown by third grade if given time
- responsive to whole-class instruction in reading
- improved by being read to
- a difficulty that benefits from memorization of whole words.
Preparing: Last Trimester-Age 5

Ecosystem may provide rich language experiences but processing differences, working memory and rapid retrieval weaknesses and/or moments of inattention create gaps in language and specifically phonemic development.

Teaching & Monitoring the Dyslexic Brain: Age 5-8 (K-3rd Grade)

Learn to Read through explicit, systematic instruction in Phonemic Awareness, Phonics, Vocabulary, Fluency, and Comprehension in School Ecosystem that fosters Listening, Respect, and Self-Regulation. Reading skill development is slow and laborious in the beginning. Specialized instruction creates activation in areas of the brain necessary for reading. Dyslexia must be addressed through explicit, systematic instruction.

Expanding the Dyslexic Brain: Age 8-End of Life

With appropriate instruction and exposure to more sophisticated texts and information auditorially, children have great potential to read on or above grade level and achieve age-appropriate skill. Reading fluency may be delayed well beyond third grade and should be practiced with easier texts. Encoding may lag.

Reconstruction of the Dyslexic Brain into a Reading Brain

Working Beneath the Surface of Dyslexia

TIP OF THE ICEBERG

Language Pinnacle

- Written Language
- Reading
- Oral Expression

Oral

Written

Oral

Phonemic Awareness

Foundational Language Abilities

Rapid Retrieval

Oral

Written

Oral

Phonology

Orthography

Syntax

Semantics

Morphology

Maryanne Wolf, RAVE-O

Word Retrieval (RAN)
PARALLEL INTERVENTION

When professionals work in silos, each attempting to guide a child’s reading brain toward reading proficiency, tutors, Speech-Language Pathologists, and Educators meet with the child outside of the classroom and each does what he/she determines to be of the most importance. The Child’s development can become fragmented and without direction.

THE INTEGRATED INTERVENTION OF THE WARDLAW SCHOOL

The Reading Program Every Child Deserves

National Reading Panel – 1997-2000

Congress asked the NICHD to work with the U.S. Department of ED to evaluate the existing research and evidence to find the best ways of teaching children to read. What makes a good reader a good reader. The researchers chose the following components – Now known as the BIG 5.

- Phonemic Awareness
- Phonics Instruction/Decoding
- Fluency
- Vocabulary
- Comprehension
Reading – The mapping of language onto symbols

- **Phoneme**
  - The smallest unit of language – an oral speech sound
    verbal/auditory /s/, /t/, /v/

- **Phonological Awareness**
  - The ability to hear, identify, count and manipulate words in sentences and word parts – verbal/auditory

- **Phonemic Awareness**
  - The ability to hear, identify, and manipulate the individual sounds (phonemes) in spoken words – verbal/auditory

- **Phonics**
  - Sound + symbol - Letter-sound correspondences necessary for the mastery of reading and spelling
    verbal/auditory/visual

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Phonemic Awareness/Phonics Instruction

The difference between phonemic awareness and phonics:
- phonemic awareness involves sounds in spoken words and phonics involves the relationship between these sounds and written symbols
- Instruction in phonemic awareness (PA) involves teaching children to focus on and manipulate phonemes in spoken syllables and words. PA instruction is frequently confused with phonics instruction, which entails teaching students how to use letter-sound relations to read or spell words.” **NRP, 2000**
Phonological Awareness: Words in Sentences

How many words do you hear in this sentence? Show me the words you hear in this sentence.

That                boy                loves

Younger students may clap or draw dashes from left to right to indicate each word heard.

Phonological Awareness: Compound Words

Say: /cowboy/
Now say /cowboy/ but don’t say /cow/
Phonological Awareness

Say: /pumpkin/

Now say /pumpkin/ but don’t say /kin/.

Phonemic Awareness

Manipulation of Sounds in Words

If this says /foz/, make it say /boz/.
Phonemic Awareness
Manipulation of Sounds in Words

If this says /boz/, make it say /baz/.

Phonemic Awareness
Manipulation of Sounds in Words

If this says /baz/, make it say /blaz/.
Phonemic Awareness Assessment/Instruction

Assessment:
CTOPP - Comprehensive Test of Phonological Processing – Torgesen, et. al
Assesses phonological awareness processing abilities related to reading in students from 5-24 years with this norm-referenced test.

Rosner, Jerome, *Helping Children Overcome Learning Difficulties*
Rosner, Jerome, Phonemic Awareness Skills Program (PASP)
Nonsense Syllables
Hearbuilder
Lindamood Phoneme Sequencing Program (LiPs)
Earobics
Teaching Reading Sourcebook (CORE)

Putting It All Together

Provide direct Instruction in each of the following – Everyday

- Phonemic Awareness – 10 minutes
- Phonics – 15 minutes
- Vocabulary from text – 10 minutes
- Guided Reading – 15 minutes
- Comprehension Strategies – 10 minutes
- Fluency – 15 minutes

Time the components based on the needs of your students.
Add Ecosystem.
Key Factors in Programming

- Explicit
- Systematic
- Provides repetition
- Overlearning
- Decoding and encoding taught together
- Higher frequency sounds and spellings taught first
- Separate introduction of visually similar letters
- Separate introduction of letters with similar sounds

Instruction: Teaching the Reading Brain Workshop Model for Differentiation

Sample K – 1st 120 minute Readers Workshop with 60 minute Writers Workshop
(Students Rotate through Guided Reading plus 6 Literacy Stations, daily)