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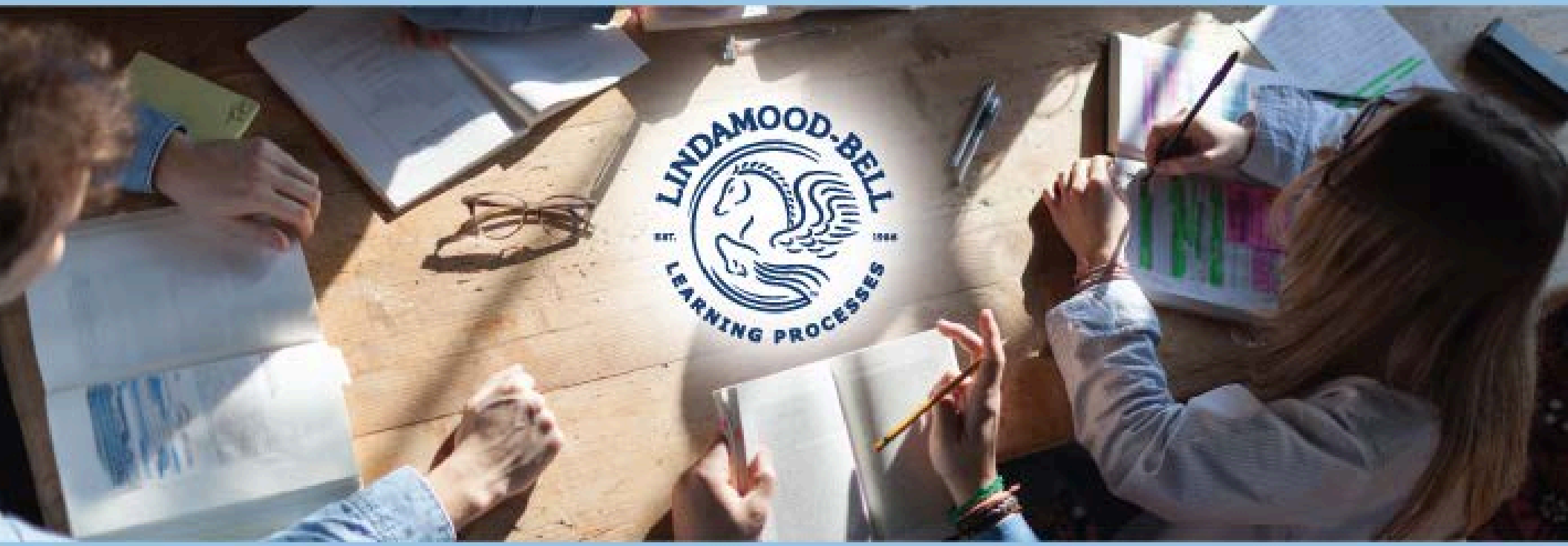

Learning Disability or Literacy Deficit

January 22, 2018

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Agenda

- Literacy Deficits
- Process-based Instruction
- Tiered Intervention & Differentiated Instruction
- School Results
- Research

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LD and Literacy Deficits

- 42% of all special education students are identified as having a specific learning disability
- 80% of LD students have a disability in the area of reading
- Deficits in phonics and fluency are characteristic of students with a disability in reading, yet these two components are critical in reaching the end goal of reading: comprehension
- Students with learning disabilities need explicit, direct instruction in phonics and fluency in order to reach the goal of comprehension

According to the National Center for Learning Disabilities (2014)

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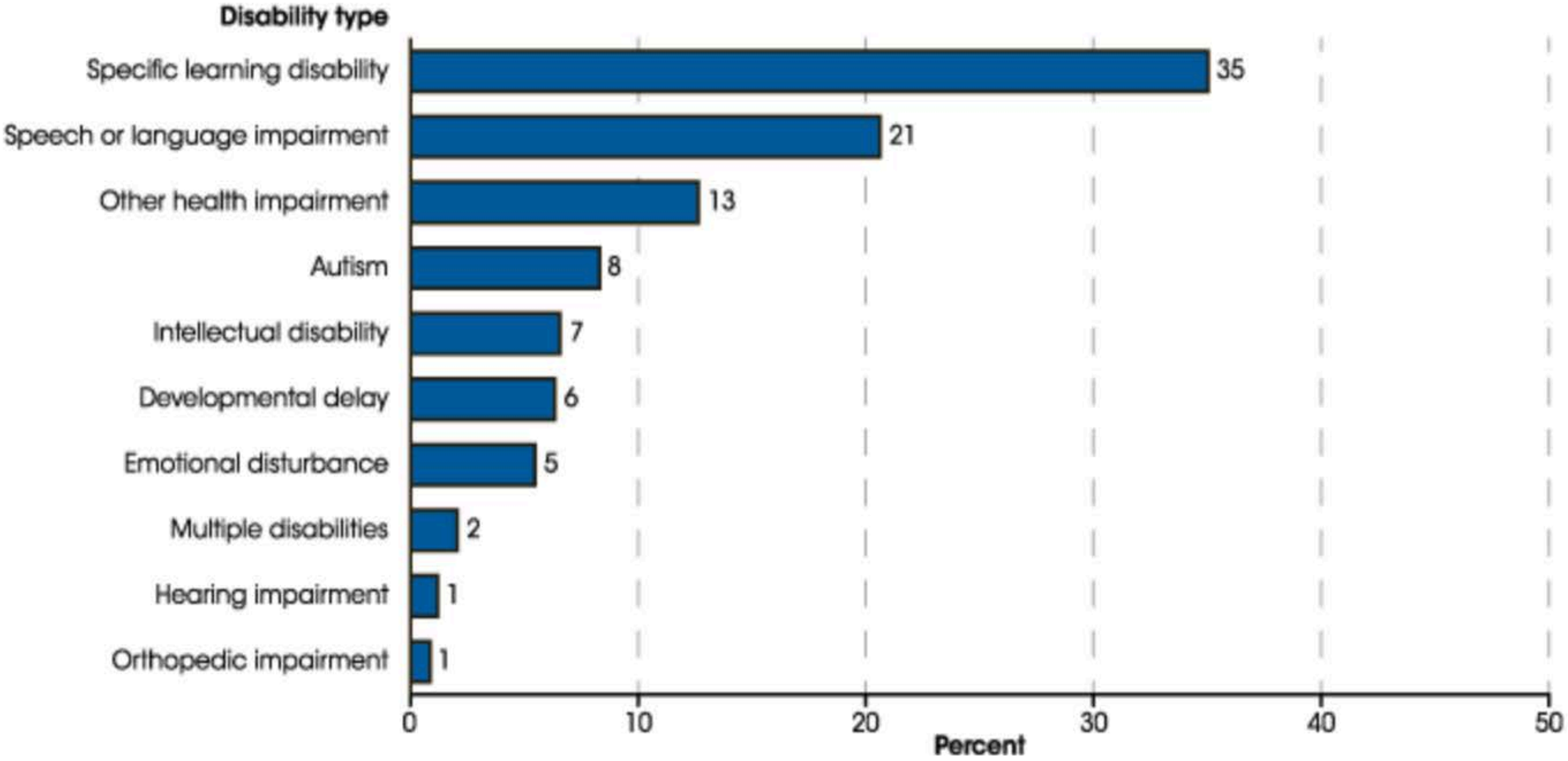
Percentage distribution of children ages 3-12 by disability type: School year 2013-14



SOURCE: U.S. Department of Education, Office of Special Education Programs, Individuals with Disabilities Education Act (IDEA) database, retrieved September 25, 2015, from http://www2.ed.gov/programs/osepidea/618-data/state-level-data-files/index.html#bcc.

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Lindamood-Bell Instructional Model

- Processing language requires **sensory input**.
- Processing language—decoding words and comprehending oral and written language—is a **cognitive act**.
- Instruction in language and literacy should be based on a **theory of cognition**.

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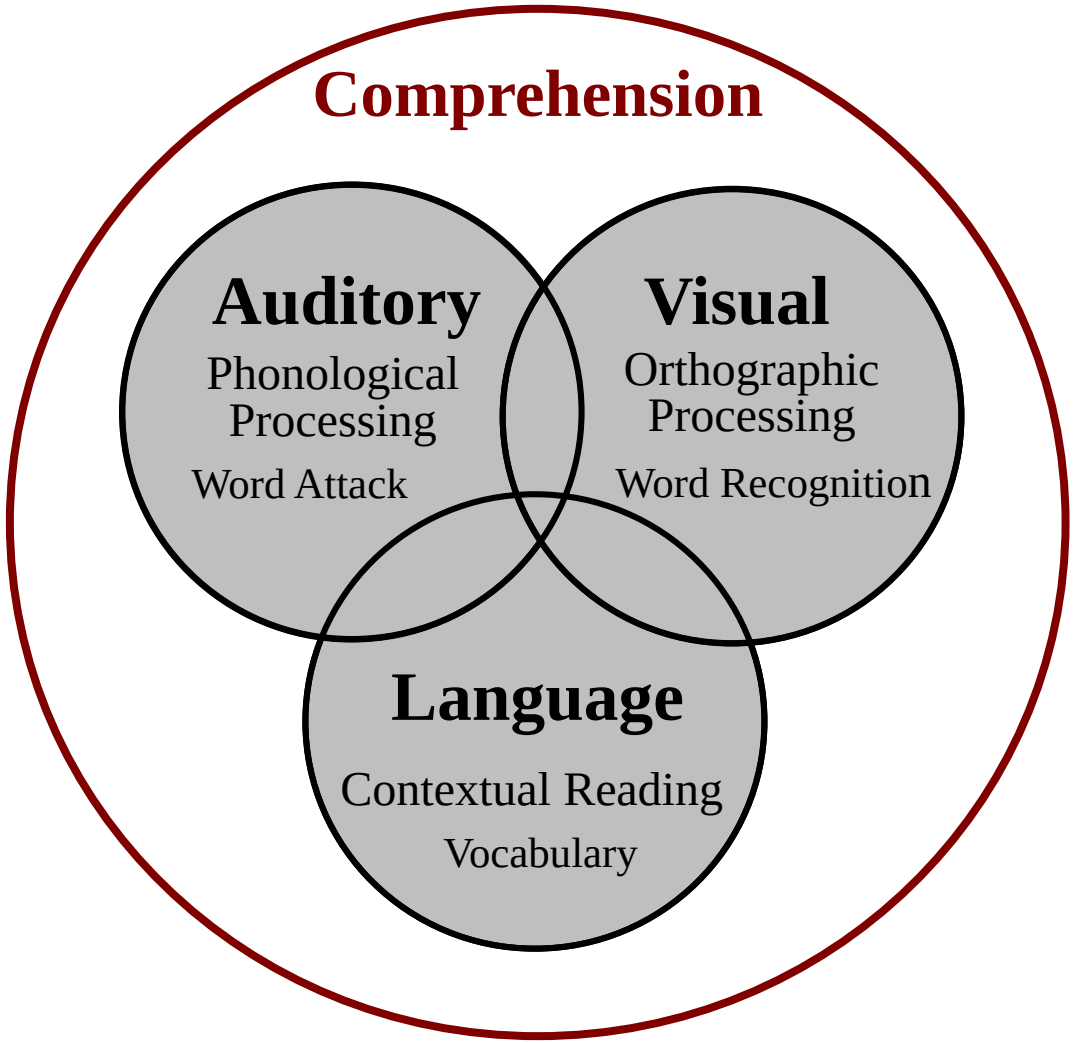
The Reading Circles

Sensory-cognitive functions underlie

these necessary **COMPONENT PARTS** of reading.



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Sensory-Cognitive Functions

- **Phonemic Awareness (PA):** the ability to perceive the identity, number, and sequence of sounds within words.

- **Symbol Imagery (SI):** the ability to create mental imagery for sounds and letters within words.

- **Concept Imagery (CI):** the ability to create an imaged gestalt (whole) from oral or written language.

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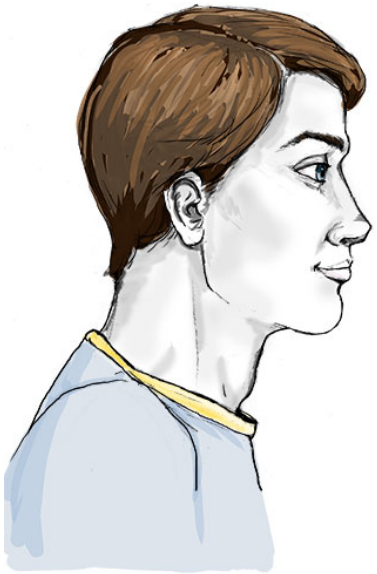
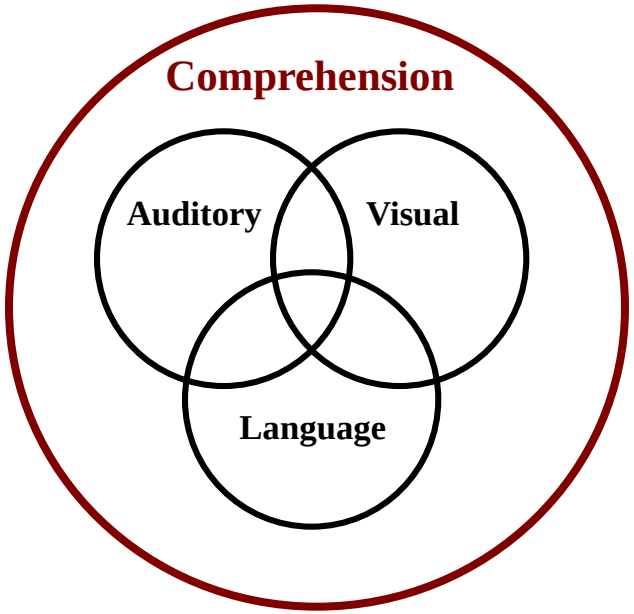
Imagery and the Language Processing Spectrum

Decoding ⟷ Comprehension

Dyslexia — Hyperlexia/Autism





Two types of imagery are needed for language processing:
Symbol Imagery and **Concept Imagery**.

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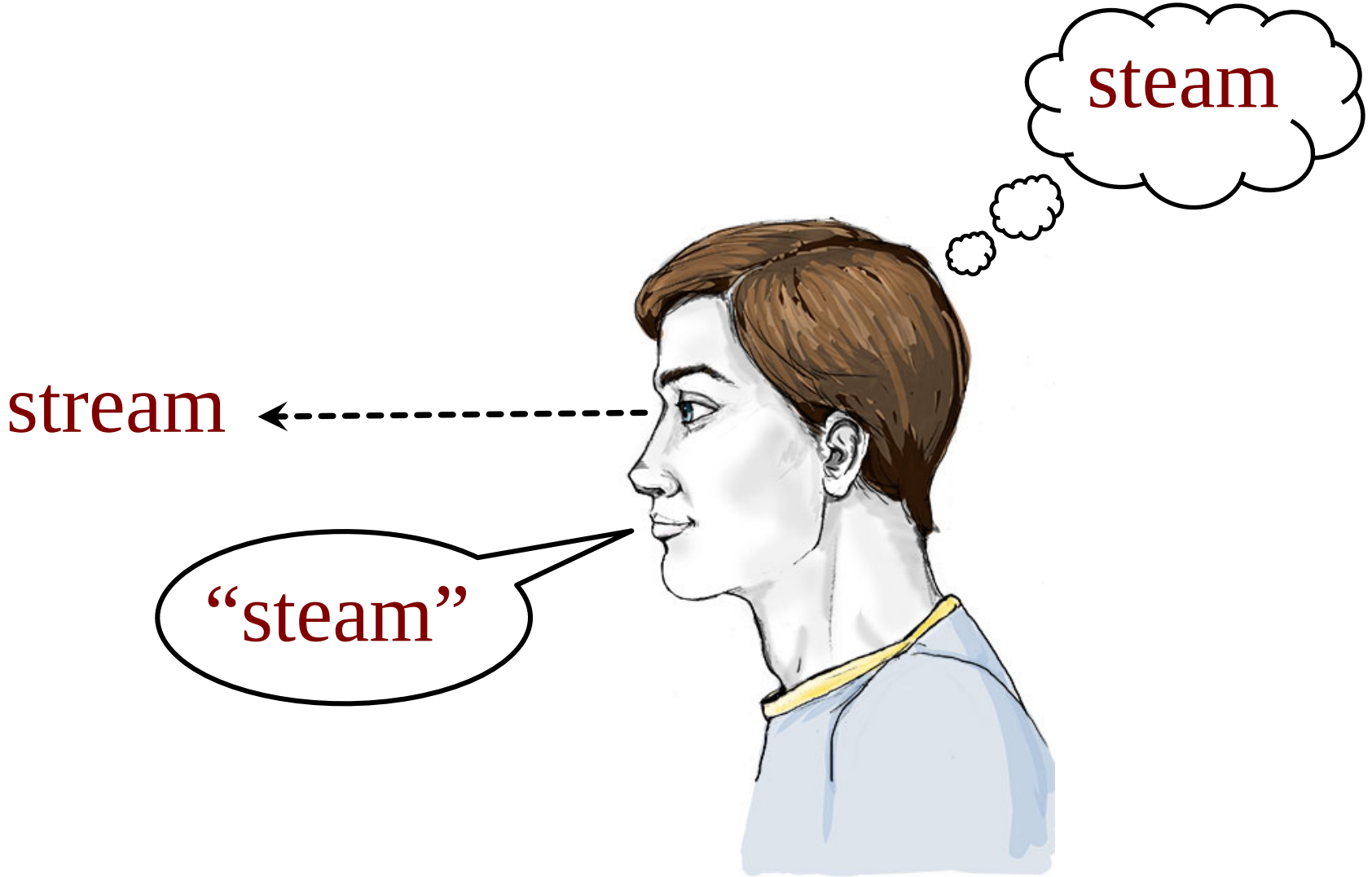
Examples of Weakness in PA & SI



Students cannot self-correct because they cannot **auditorily perceive (PA)** and **visually image (SI)** that they omitted the ‘r.’

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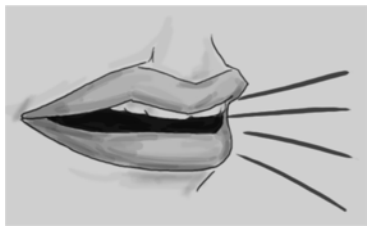
Imagery is sensory information that prevents language from going in one ear and out the other.

Imaged Gestalt (whole)



Oral Language

Written Language

Higher Order Thinking

Main Idea
Conclusion
Inference
Predict/Extend
Evaluate

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Process-Based Education

Teach Reading as a Process, Not a Subject

Process-Based Education brings sensory information to a conscious level so that information can be applied to language and literacy skills.

"We cannot think about something of which we are not consciously aware, and we cannot be aware of something not perceived sufficiently at the sensory level to come to consciousness."

~ Karl Pribram, *Brain and Perception*

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Process-Based Instruction

Underlying cognitive processes (generating images) allow students to access the content.

Seeing Stars is process-based instruction that intentionally and systematically develops symbol imagery– the ability to create mental representations for sounds and letters in words–and phonemic awareness.

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Process-Based Instruction

Underlying cognitive processes (generating images) allow students to access the content.

Visualizing and Verbalizing is process-based instruction that intentionally and systematically develops concept imagery– the ability to create an imaged gestalt–as a basis for comprehension and higher order thinking.

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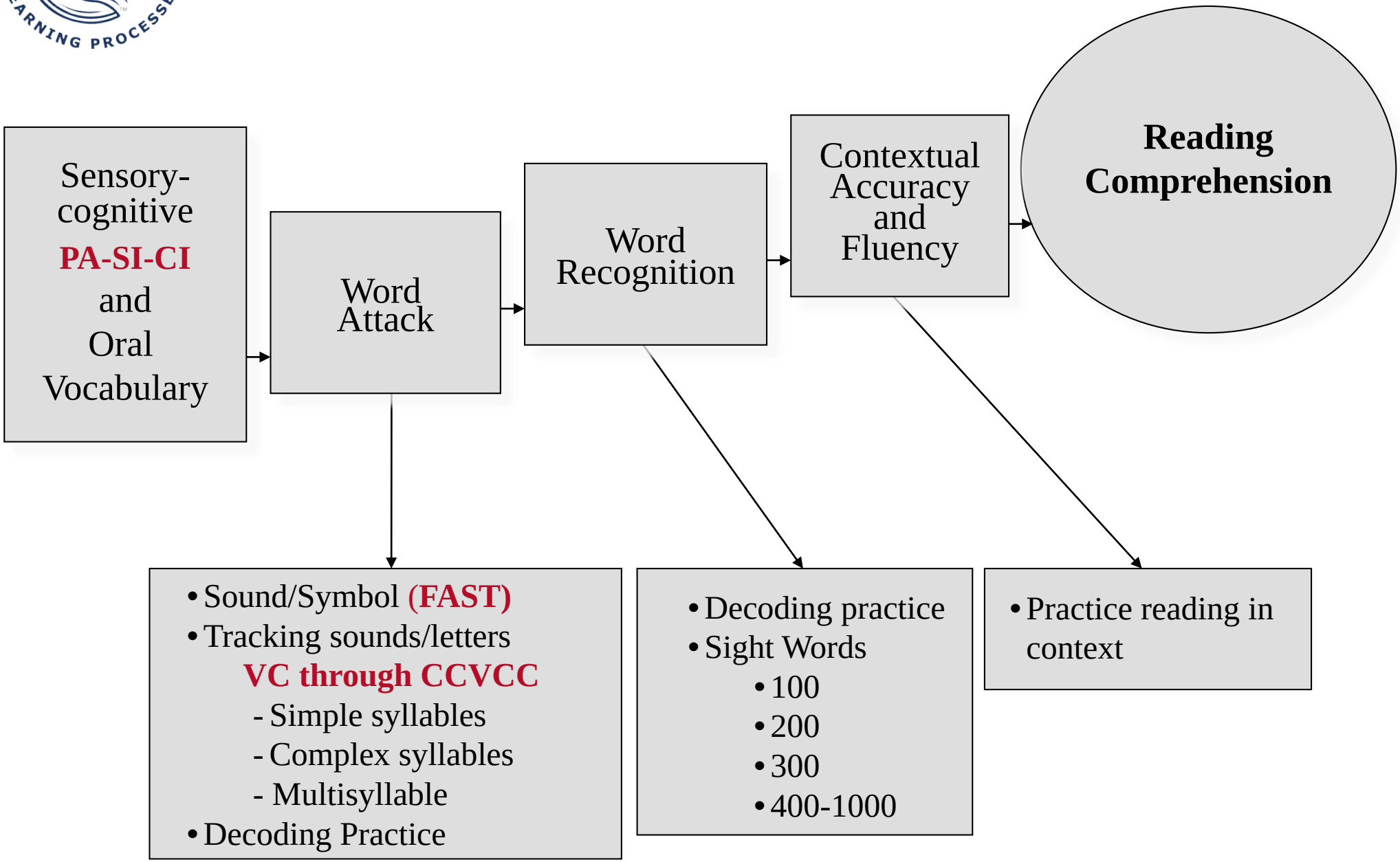
Cascade for Reading Competency



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Independence

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Independence

Self-Correct

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Independence

Self-Correct

Monitor

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Independence

Self-Correct

Monitor

Sensory Input

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Dual Coding Theory

Allan Paivio created Dual Coding Theory (DCT), a general theory of cognition.

"Performance is mediated by the joint activity of verbal and nonverbal systems…cognition is always an interplay between the verbal and nonverbal systems."

This, of course, applies to all academic performance.

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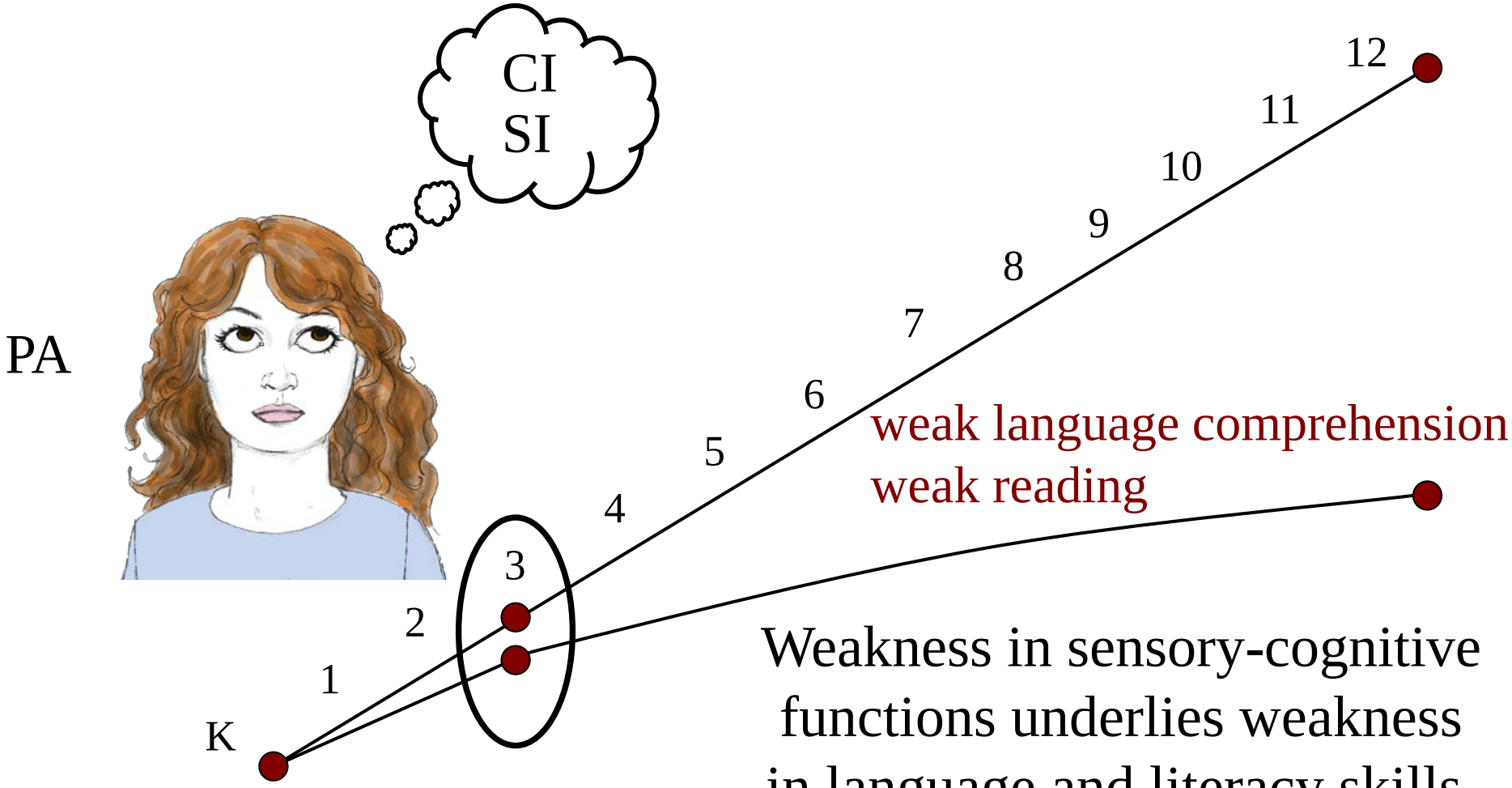
The K-12 Pipeline

Weak language and literacy skills are the primary cause of failure to make one year of gain for one year of instruction.



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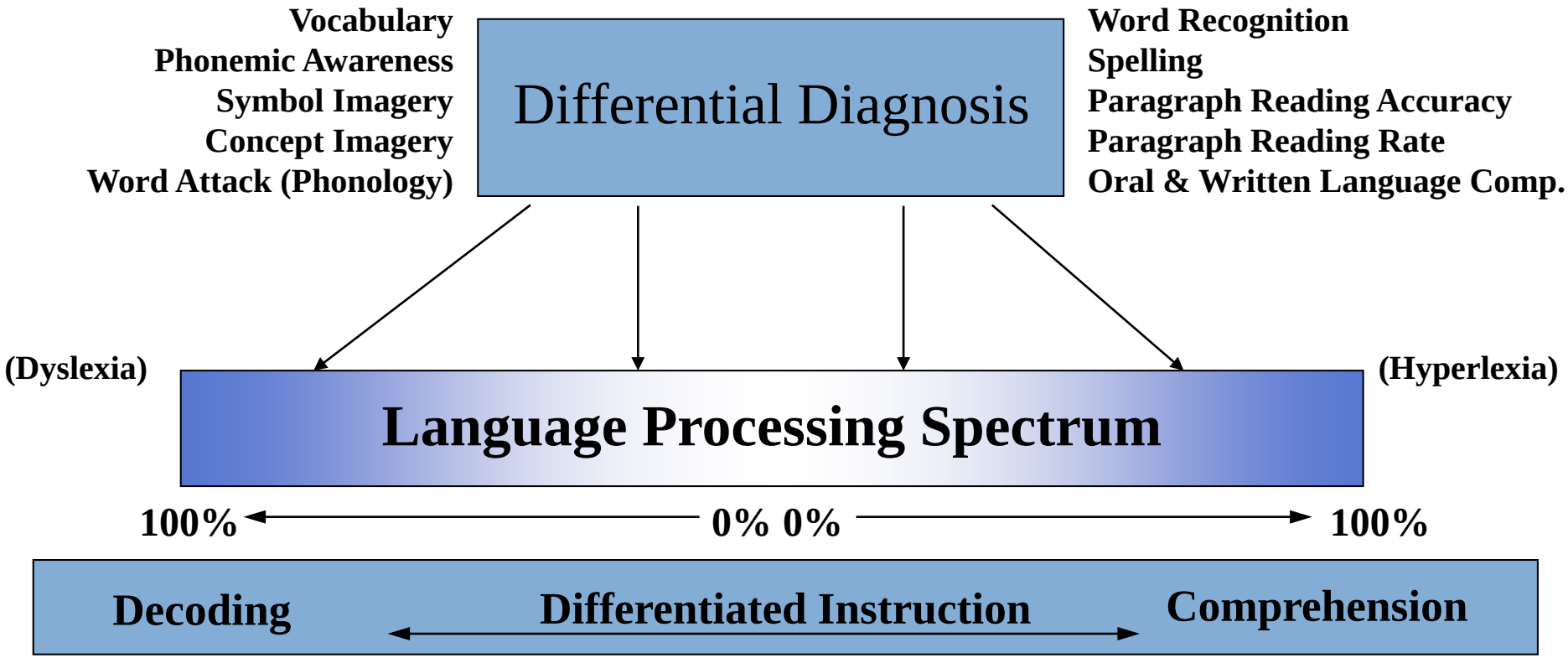
Differentiated Instruction



Weighted Assessments
Word Attack
Word Recognition
Spelling
Rate } Decoding Fluency
Accuracy
Achievement Tests

Weighted Assessments
Vocabulary
Fluency
Oral Comprehension
Written Comprehension
Oral Directions
Achievement Tests

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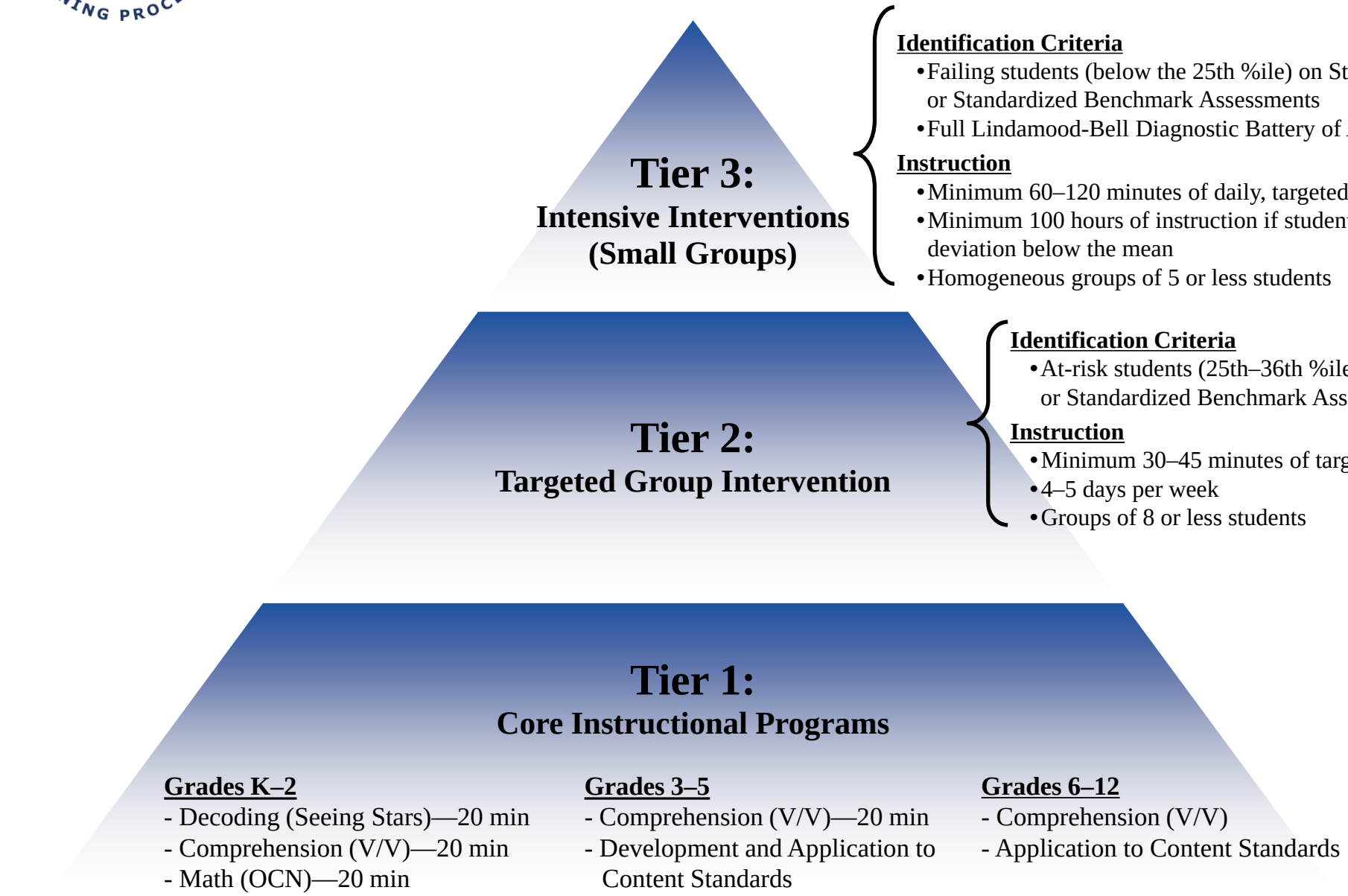
The Lindamood-Bell RtI Model



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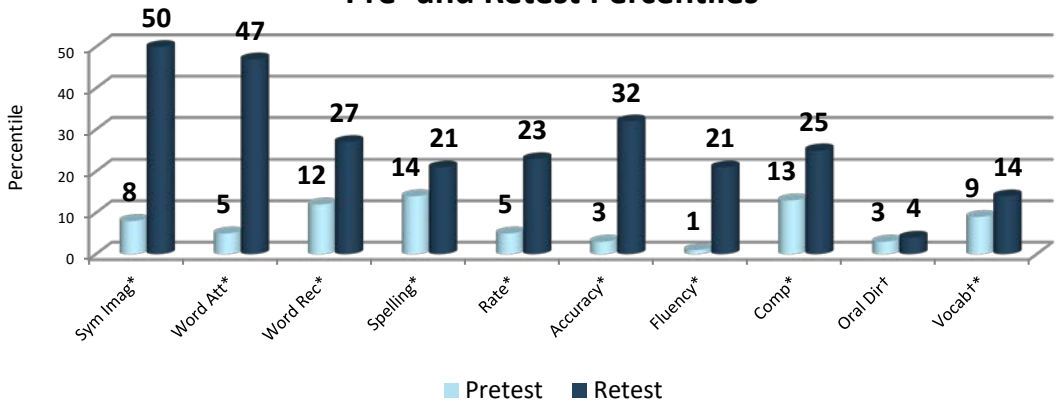
Test Results

All Schools Combined

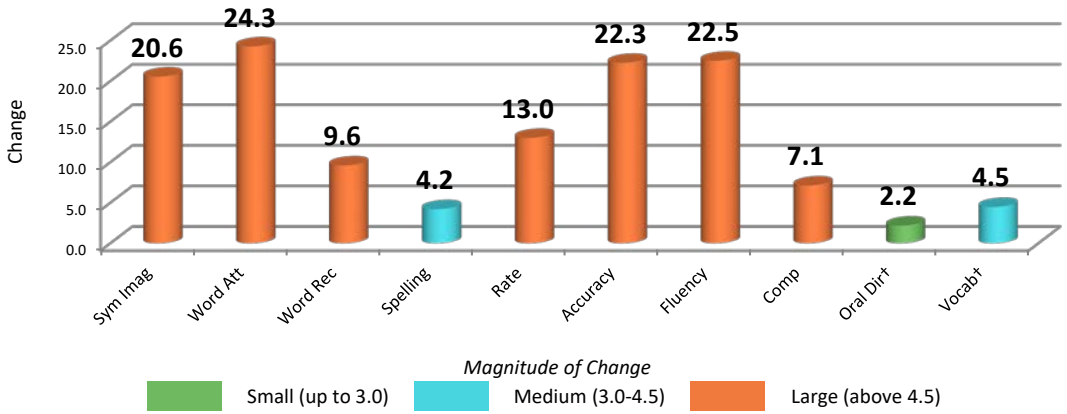
Demographics	
Number of Students	40
Average Age	11.5

Pre- and Retest Percentiles



*Statistically significant ($p \leq .05$).

Average Standard Score Changes



†These skills are not directly stimulated by Seeing Stars instruction. Therefore, growth may not be commensurate with growth on targeted measures.

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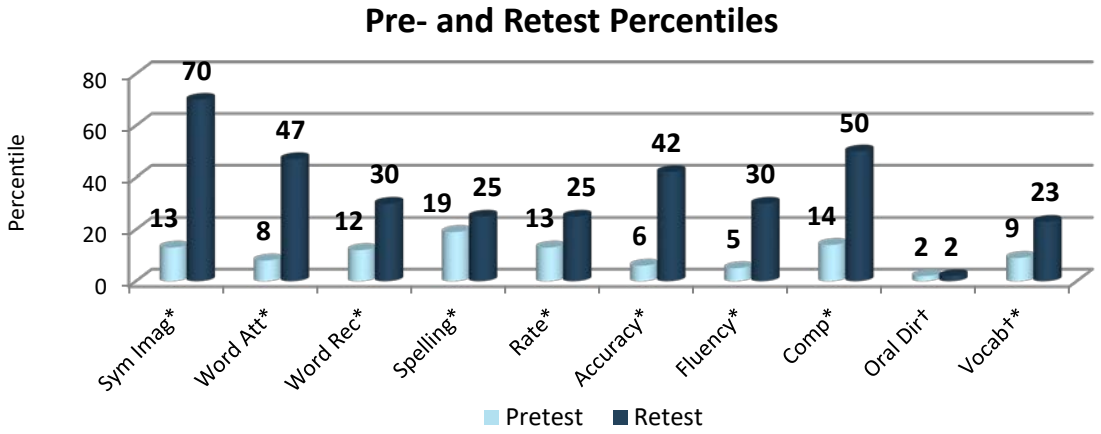
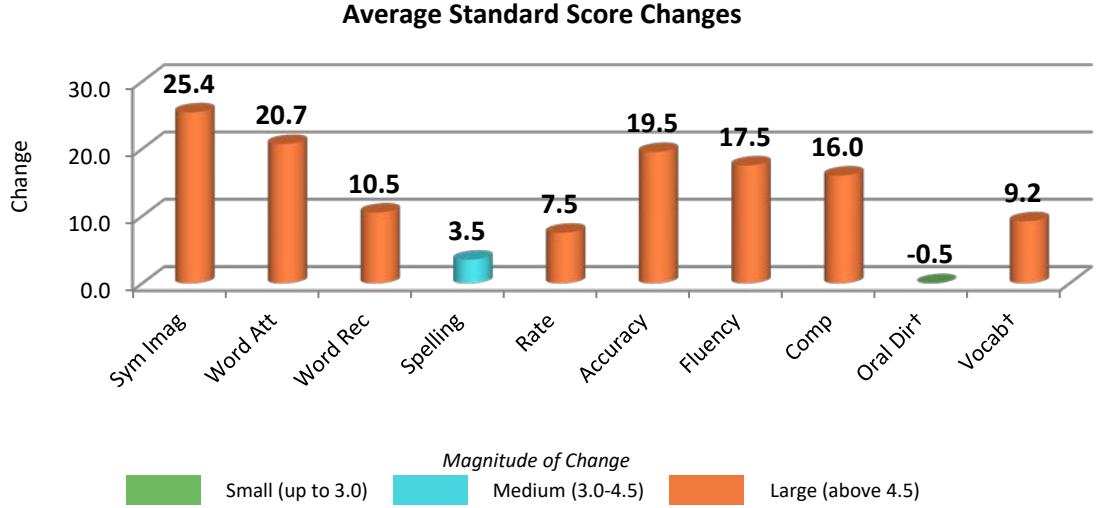
Test Results

Demographics	
Number of Students	10
Average Age	11.4



*Statistically significant ($p \leq .05$).



†These skills are not directly stimulated by Seeing Stars instruction. Therefore, growth may not be commensurate with growth on targeted measures.

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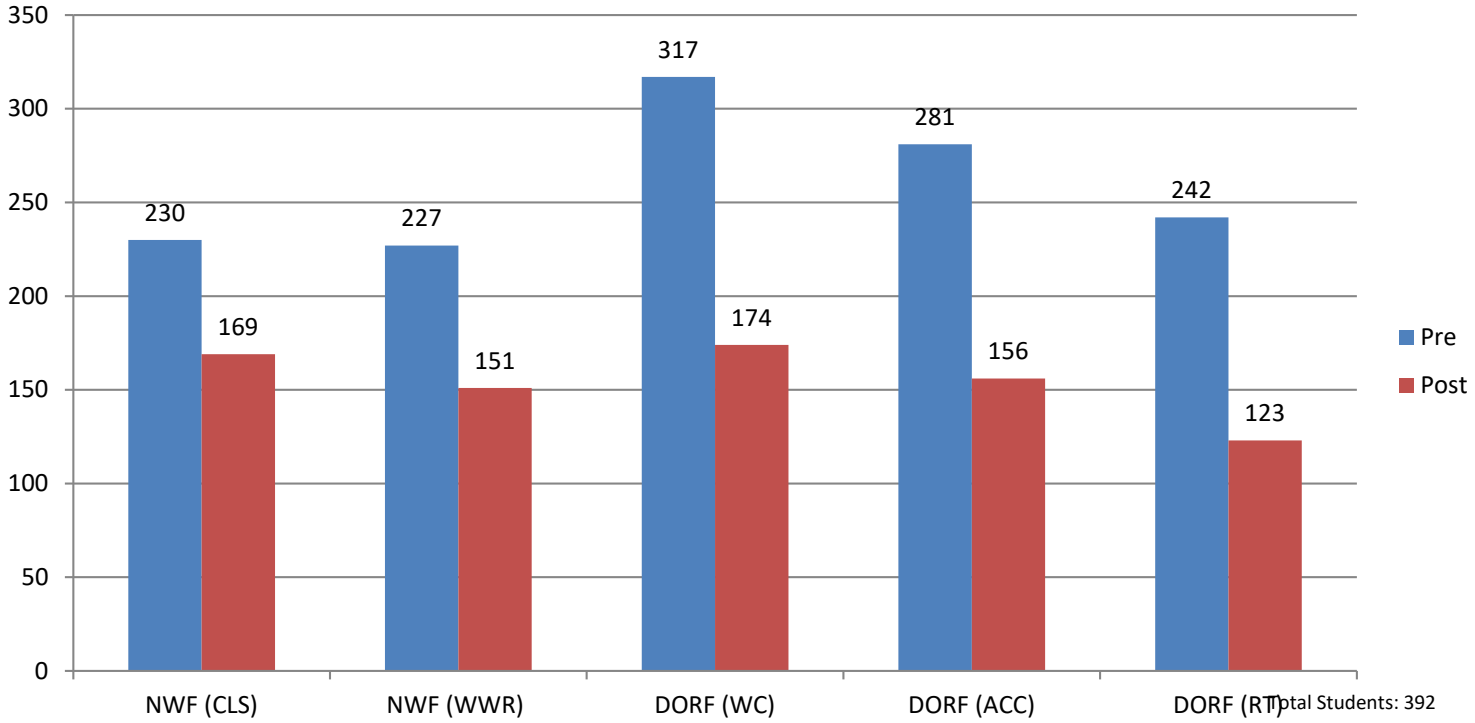
1st Grade Seeing Stars Below Benchmark DIBELS Comparison Pre/Post



Total Students: 392

Key:

NWF (CLS) – Nonsense Word Fluency (Correct Letter Sounds)

NWF (WWR) – Nonsense Word Fluency (Whole Words Read)

DORF (WC) – DIBELS Oral Reading Fluency (Words Correct)

DORF (ACC) - DIBELS Oral Reading Fluency (Accuracy)

DORF (RT) - DIBELS Oral Reading Fluency (Retelling)

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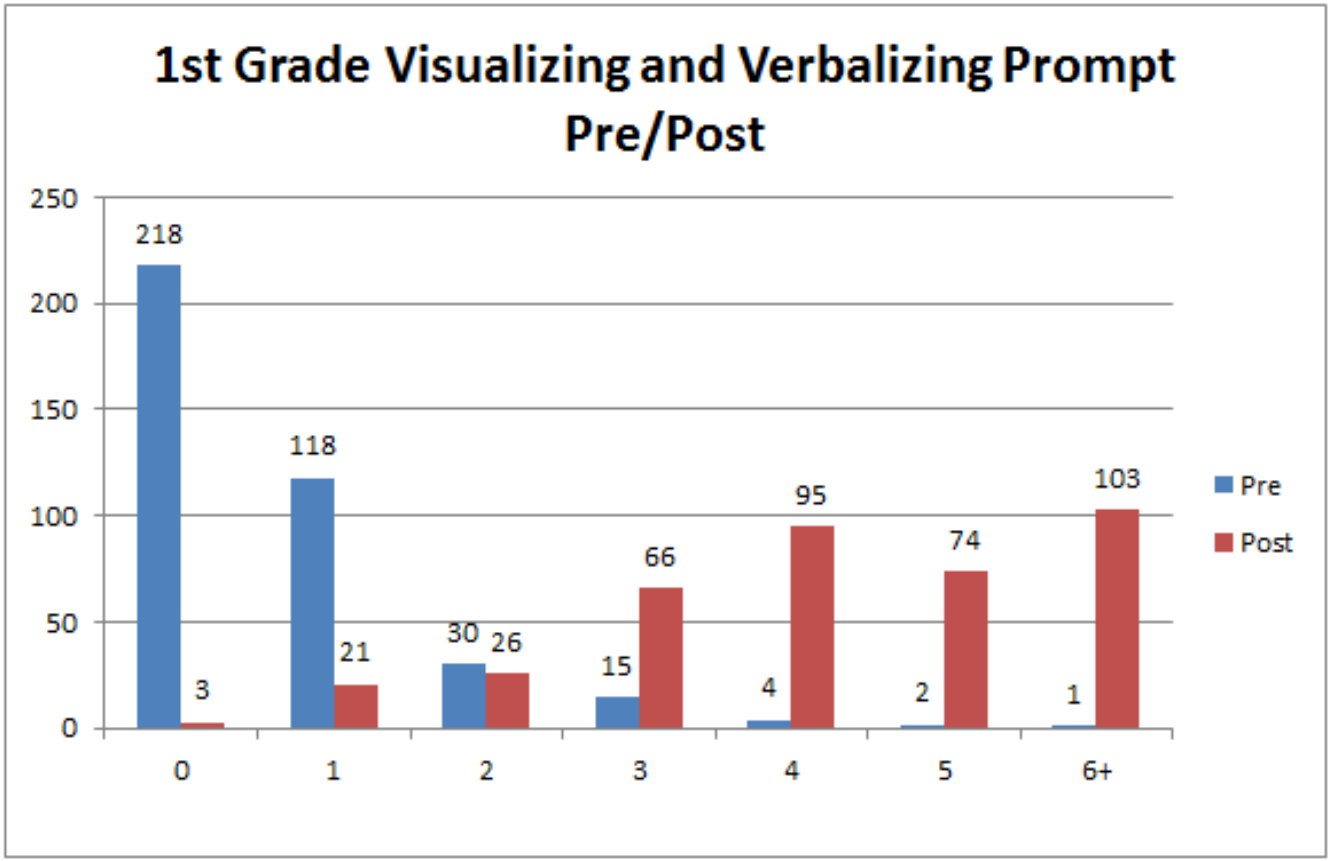

Prompt: Listen to my sentence…The cat is in the tree. What do you picture?

12 Structure Words Possible: what, size, color, number, shape, where, movement, mood, background, perspective, when, sound

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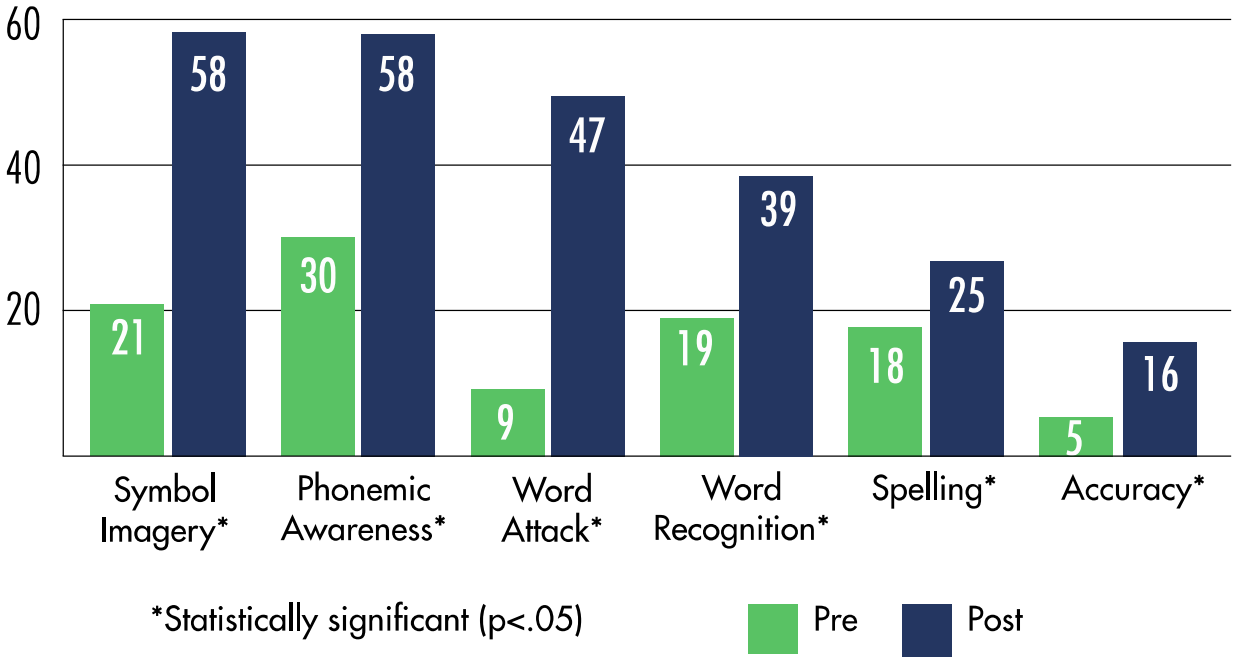
Dyslexic Students

Average Hours of Instruction: **110**

n = 1,234 • Average Grade Level: **5th**

Pre- and Posttest Percentiles



■ Pretest ■ Posttest

*Statistically significant ($p \leq .05$)

Based on students who received a minimum of 20 hours of V/V-only instruction at Learning Centers, 2008 through 2013.

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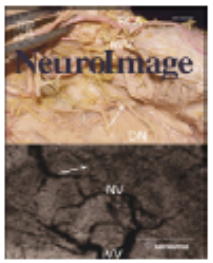
Georgetown University
Center for the Study of Learning

NeuroImage 57 (2011) 733–741

Contents lists available at ScienceDirect

NeuroImage

journal homepage: www.elsevier.com/locate/ynimg



Gray matter volume changes following reading intervention in dyslexic children

Anthony J. Krafnick [a], D. Lynn Flowers [a,b], Eileen M. Napoliello [a], Guinevere F. Eden [a,*]

[a] Center for the Study of Learning, Georgetown University Medical Center, 4000 Reservoir Road, Building D Suite 150, Washington, DC 20057, USA
[b] Wake Forest University Baptist Medical Center, Winston Salem, NC, 27157

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Gray Matter Volume Changes Following Seeing Stars Instruction with Dyslexic Children

- Eleven children, identified as *dyslexic*, received explicit instruction in symbol imagery as applied to reading.
- After eight weeks of reading intervention, the children in the study showed marked improvement in several reading and reading related skills.
  - Significant at $p<.001$: LAC, SI, Word Recognition
  - Significant at $p<.01$: Rapid Naming
  - Significant at $p<.05$: Word Attack
  - Significant at $p<.05$: Passage Comprehension
- Improvements in reading ability were accompanied by changes in brain structure.

*Krafnick et al., 2011

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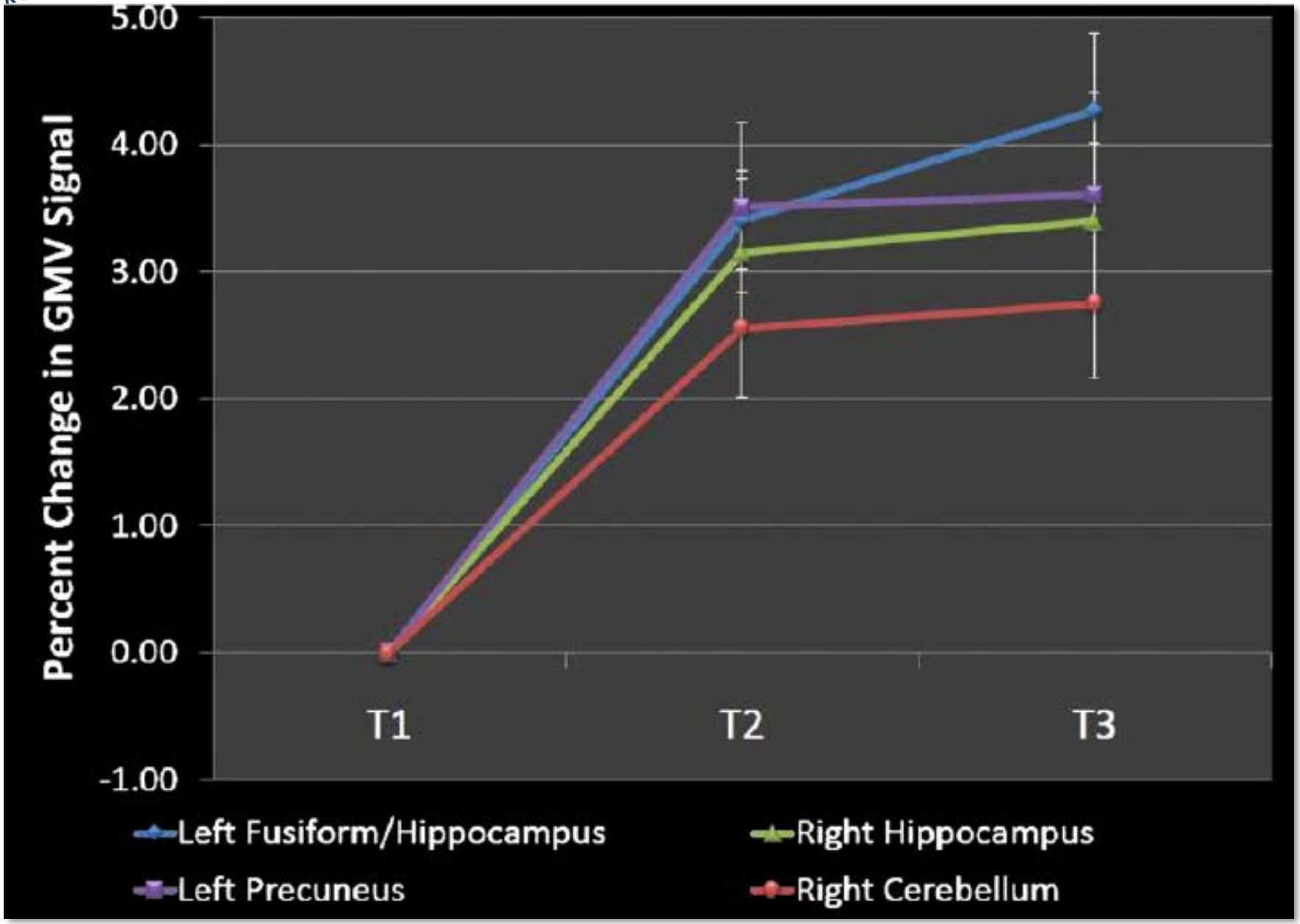
Increases maintained after the intervention ended.



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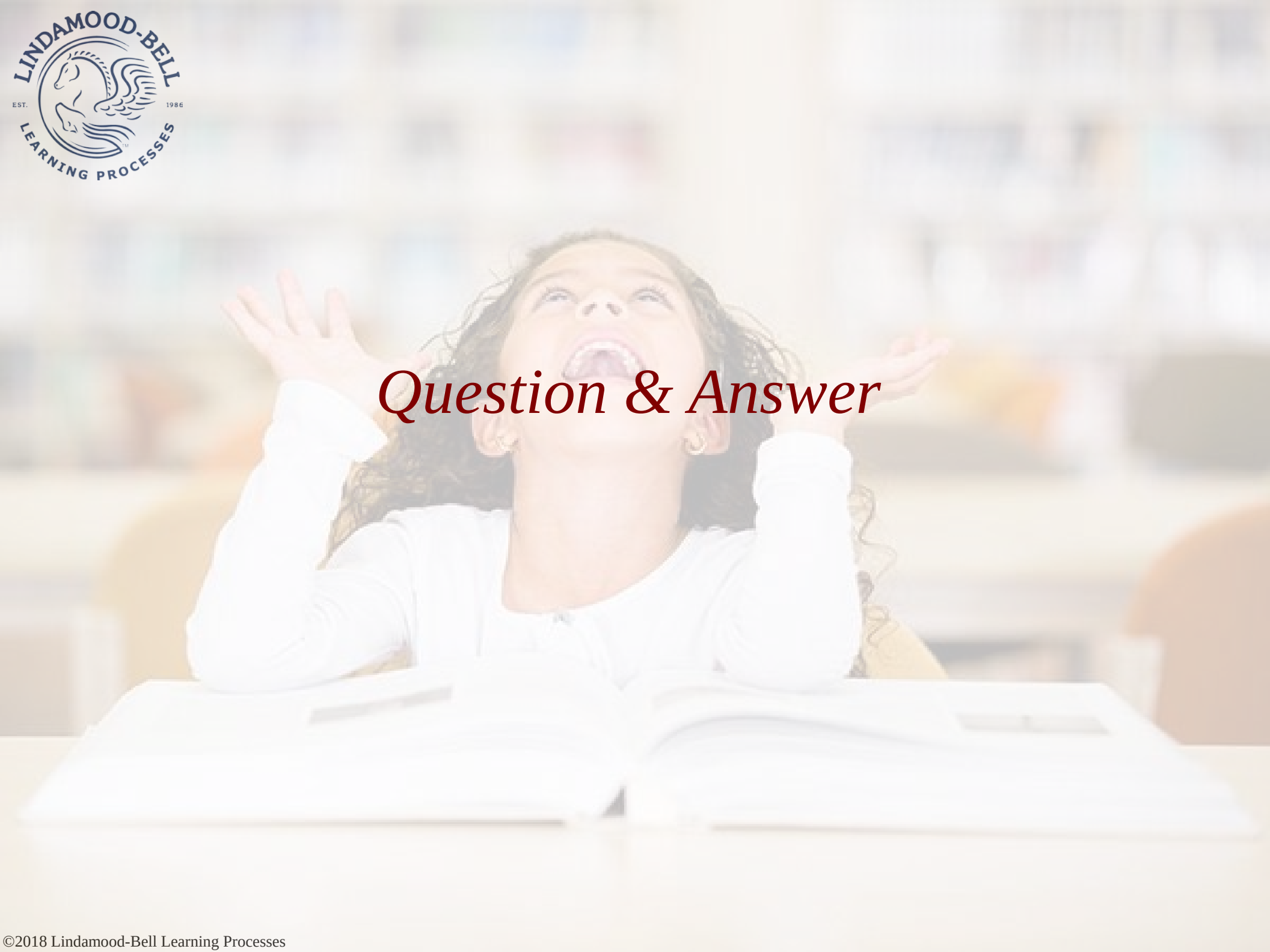

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Thank You

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