A Comprehensive Model for Specific Learning Disability Evaluations

COLORADO
Department of Education

Using the *Building Blocks Brain Model of Development* to Understand and Assess Learning Disabilities

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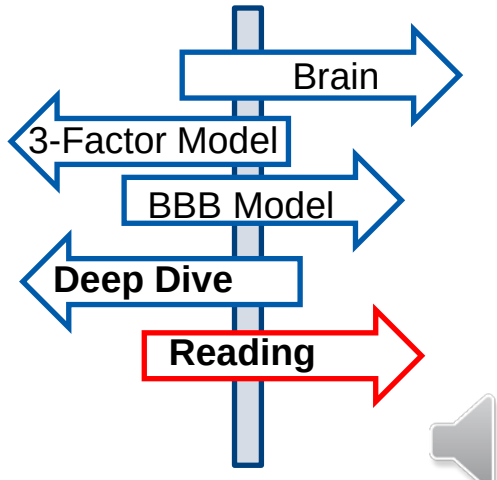
Module: 6.3 BBBM and Writing

Using the Building Blocks Brain Model to Understand and Assess Writing Disorders



Learning Outcomes

- What are the common *Fundamental* neurocognitive deficits related to writing disorders.

- Name one *Higher Order block* that is linked to writing.

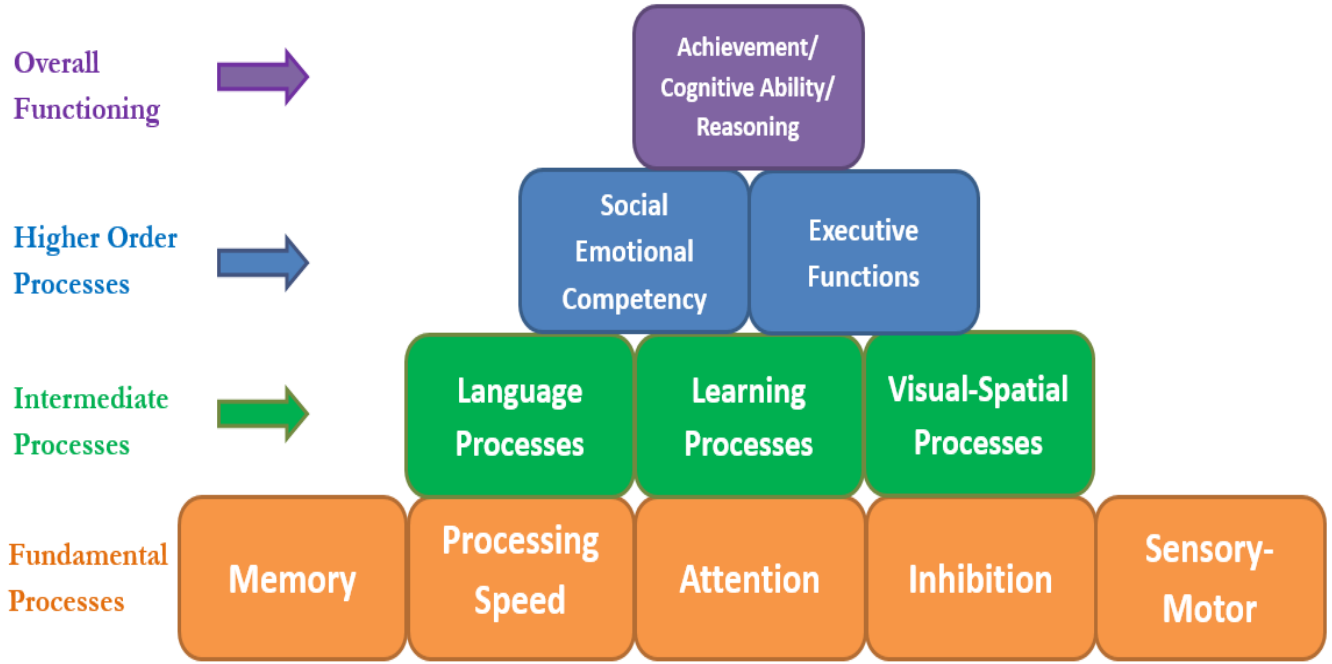
Important Note

The information, concepts, and models provided in this presentation are intended to give practitioners a framework when conducting special education evaluations. It is emphasized that nothing in this presentation is meant to be directive or prescriptive. Professionals are free to use some, or all of the information presented, but they are not required to do so in their practice. **Always consult with your special education director for clarity around district policies and expectations for special education evaluations.**

The BBBM-*Review*

- Each block represents a key neurocognitive function(s)
- Each level is dependent on the level below
- When all blocks are working together in seamless integration, a child makes age-appropriate progress in multiple domains of life

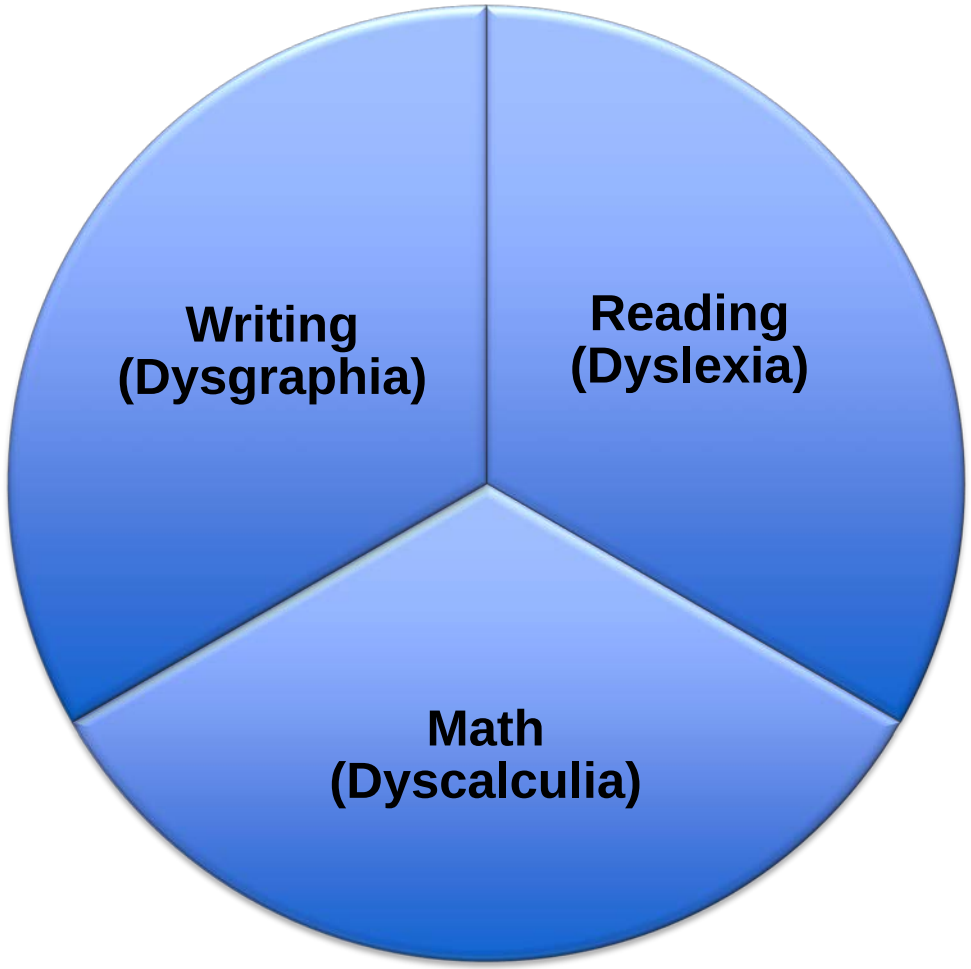
Building Blocks of Brain Development and Function



The Hierarchy of Neurocognitive Functioning © - created by Peter Thompson, Ph.D. 2013, adapted from the works of Miller 2007; Reitan and Wolfson 2004; Hale and Fiorello 2004.
The Building Blocks of Brain Development © – further adapted by the CO Brain Injury Steering Committee, 2016.

Most Typical SLD Areas

- Most typical disorders in school are ***reading, writing and mathematics***
- "Why" a student is failing is typically answered by finding the crack in one or more blocks at the lower level(s) of the BBBM
- BBBM can be used with other models



Writing Disorders

Prevalence and Considerations

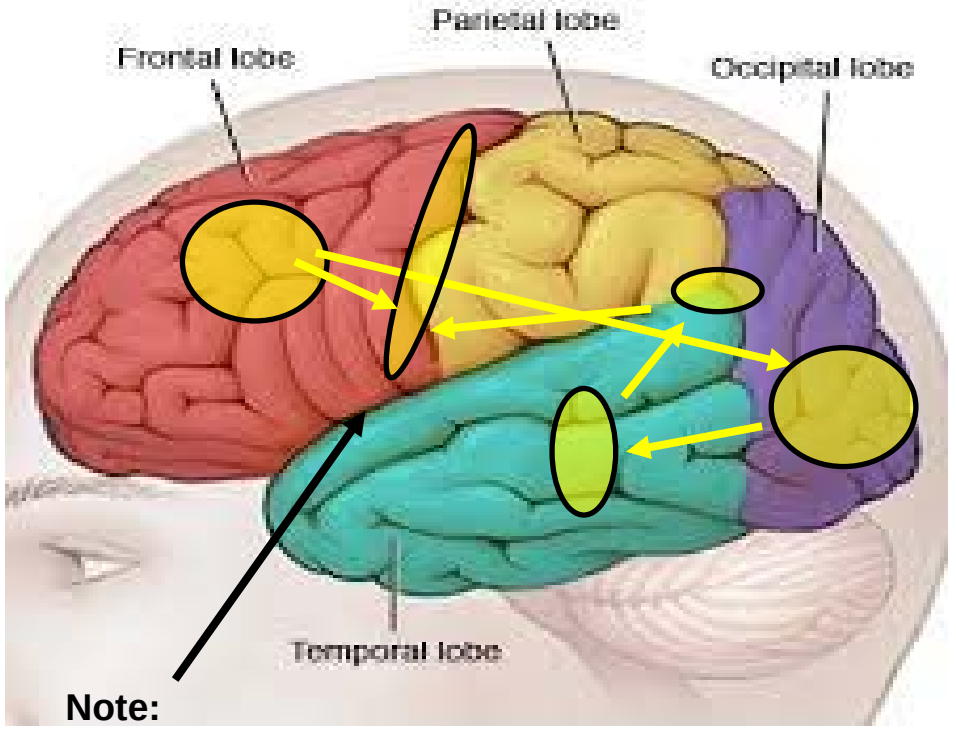
- 7-15% of the school aged populations
- High co-occurance with other disorders
  (Reading-30-47%; ADHD-21%)
- Uses many of the same brain structures/functions as reading
- Writing is complex because it adds a “motor” function
- Variable definitions in research (e.g. Dysgraphia)

Evaluation Assumptions

- Student has been identified with poor achievement in writing
- Student has not responded to interventions (RTI)
- Student is in special education process for a full evaluation
  Student performed below average on formal achievement / academic testing that centers on writing (e.g. WCJ, WIAT)

I. Writing Brain *Circuitry*

1. **Bi-lateral** activation--Writing activates multiple brain areas on both right and left side of the brain
2. **Frontal lobe**—executive functions, working memory and control of motor functions—help from cerebellum
3. **Occipital Lobe** (Visual Process)
4. **Phonological** area in Temporal lobe
5. **Crossroads** of brain—Occipital-Parietal-Temporal lobes plays key role—angular gyrus
6. **Motor** area—expression
7. **Memory** circuit—Medial Temporal Lobe

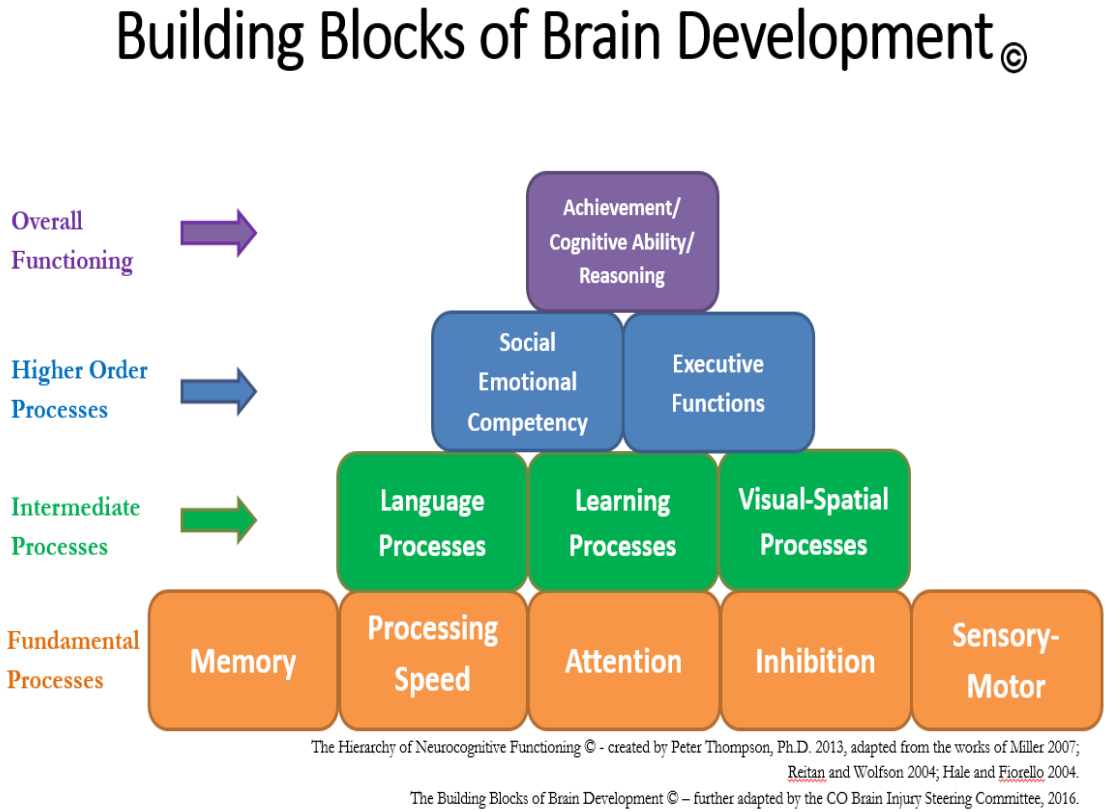


Note: Processing Speed and Motor strip

Writing: Key Deficits Mapped onto the BBBM

✓ Starts with low "achievement" in writing (RTI / achievement data)

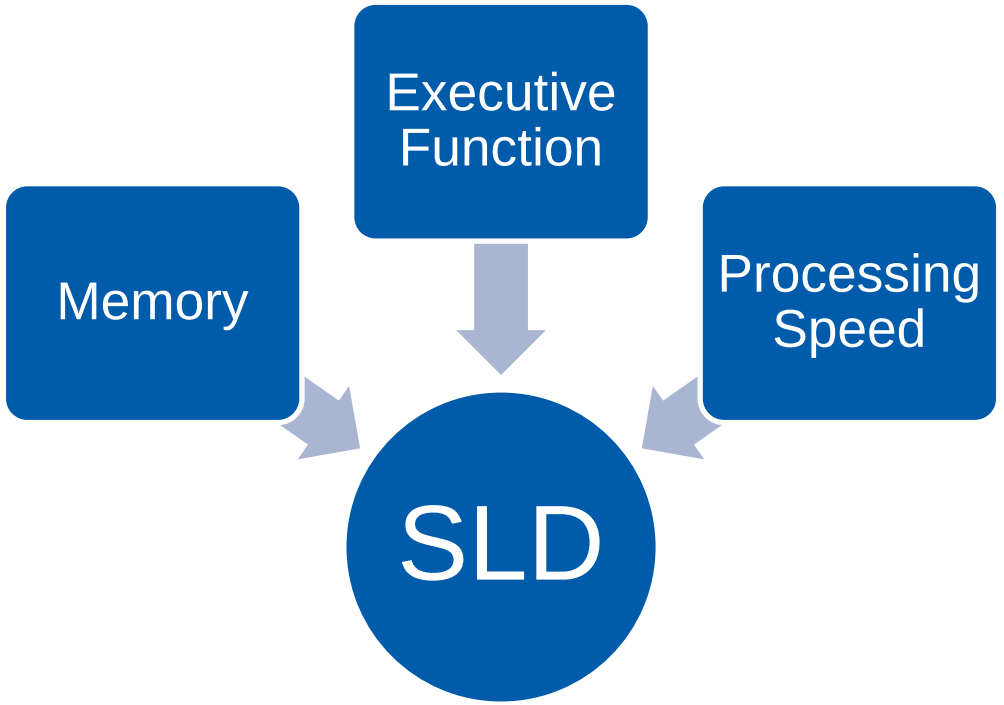
- Executive Function
  - **Attention** and **Inhibition**
- Memory (WM, STM, LTM, VM)
- Processing Speed
- Sensory Motor
- Visual-Spatial
- Language



Common Blocks for all SLD Evaluations (Necessary, but Not Sufficient)

Fundamental Blocks

- Executive Function
  - Attention
  - Inhibition
- Memory (WM, STM, VM)
- Processing Speed
  - Rapid Naming
  - Vis-motor speed



SLD Evaluations: Typical Areas Assessed

Common BBBM For All SLD Evaluations

Fundamental Areas
(Exec Function)-Attention, Inhibit
(Memory) WM, STM, VM, and Proc Sp

At Least One or More Higher Order Block

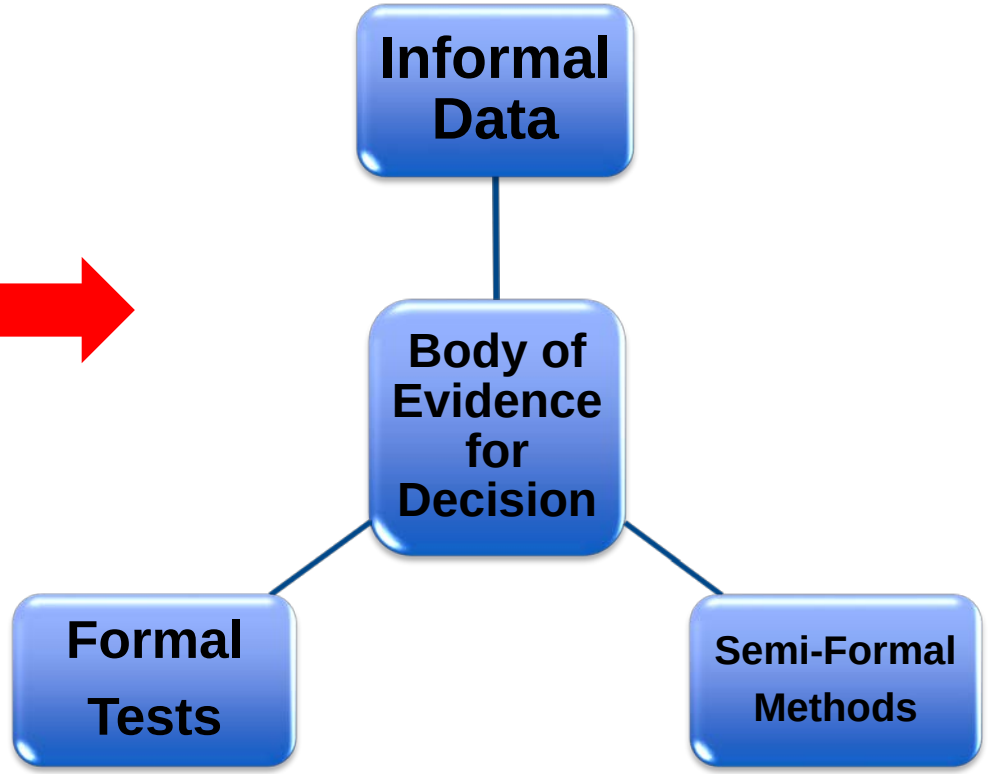
Reading----Language Processes
Math—New Learning / Visual Spat
Writing—Visual Spat / Sens/Motor
Language Processes

Typical Evaluation: Writing Disorder

I. Starts RTI information and
Achievement testing data

II. BBBM and 3 Factor Model

- Attention
- Processing Speed
- Memory (Multiple Types)
- Visual-Spatial
- Sensory Motor
- Language



Thompson-Sousa, 2013 / 2020

Special Considerations for Writing Disorders

- **Writing disorders may have multiple dysfunctional brain areas**
  - **Double Deficit—more significant SLD**
- **Executive function and writing disorders have a high correlation**
- **Students with writing disorders may struggle in several subjects**

Summary

- All learning disabilities involve a neurocognitive deficit in one or more of the BBBM blocks. It is common to have several blocks involved in a WD.

- Typically, SLD evaluations should include at least 3 major fundamental blocks, such as *Attention, Memory, Processing Speed*. Different aspects of *Executive Functioning* will also be involved.

- Writing is a very complex neurocognitive task, therefore there maybe more brain functions to evaluate, such as the higher order blocks of language processes, sensory-motor functions, and visual-spatial processes.

End of Module 6.3
BBBM and Writing

Using the *Building Blocks of Brain Development* for a Comprehensive SLD Evaluation

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