

# Thoughts on Simple and Not So Simple Views of Writing

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Based on NICHD-funded  
research on  
typical and low achieving  
writers 1989-2008 and  
specific learning disabilities  
affecting writing  
1995-2006, 2011-2016.

# Comparison of Earlier Simple View of Writing (Berninger & Amtman, 2003) and Later Not So Simple View of Writing (Berninger & Winn, 2006)

## Simple View of Writing

Berninger, V., & Amtmann, D. (2003). Preventing written expression disabilities through early and continuing assessment and intervention for handwriting and/or spelling problems: Research into practice. In H.L. Swanson, K. Harris, & S. Graham (Eds.), *Handbook of Research on Learning Disabilities* (pp. 345-363). New York: Guilford.

4 major processes: text generation and transcription supported by executive functions and working memory

Text generation and transcription are processes in translation (Hayes' model, 2012) and executive functions are involved in planning and reviewing/revising (Hayes's model, 2012).

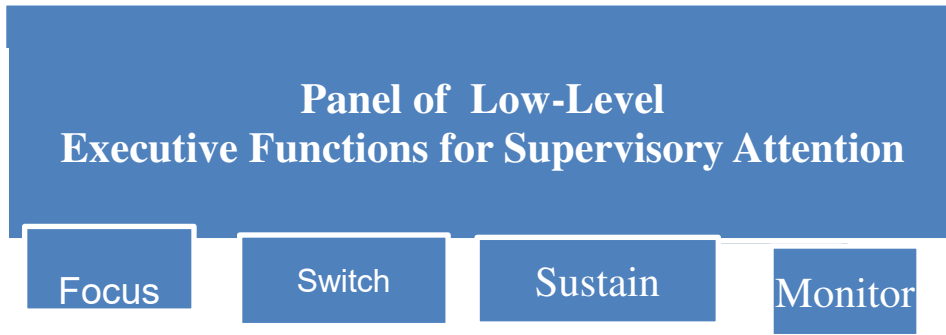
## Not So Simple View of Writing

1. Added to Working Memory cognitive flow
2. Added Working Memory Components (see next slide )
3. Modified Executive Functions:
  - a) Replaced conscious attention with metalinguistic awareness and metacognitive awareness, focused attention, switching attention, staying on task, and self-monitoring
  - b) introduced goal setting and cognitive presence and engagement

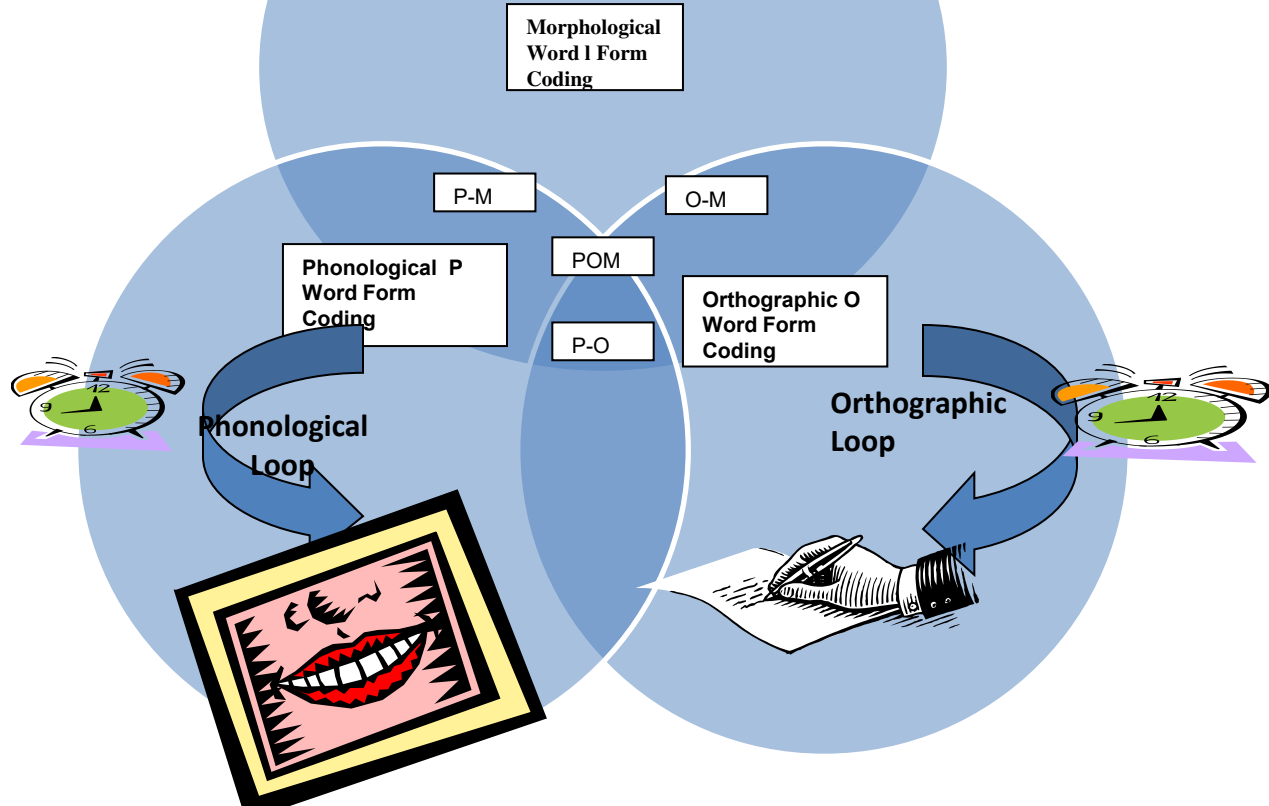
## See next slide for defining working memory components

Note: **Short term memory** supports phonological, orthographic, and morphological coding; **long-term memory** supports their interconnections in decoding and encoding words and the translation of cognitions into written language (syntax and text); **working memory** supports the coding, decoding, encoding, and translation processes as as they unfold currently in time.

Working Memory System Supporting Language Learning and Used to Identify Phenotype Profiles See Figures 9.2 And 9.3 in Berninger (2015) Interdisciplinary Frameworks



Syntax for Accumulating Coded Word Forms



# Defining Terms for Defining SLDs

**Learning Profile:** *pattern* of specific reading, writing, and/or oral language skills based on assessed achievement in each skill

**Phenotype Profile:** behavioral measures shown in research to be associated with specific genetic markers of clinical disorders such as SLDs

**Orthographic Coding:** storing and processing letters in mind's eye

**Phonological Coding:** storing and processing sound units in mind's ear

**Orthographic Loop:** outputs orthographic codes through hand

**Phonological Loop:** outputs phonological codes through mouth

**Morphological Coding:** storing and processing base word + affixes

**Syntax Coding:** storing and processing order of multiple words and gluing affixed words and function words (conjunctions, prepositions, articles) to other words within clausal units

# Does research show how to define dysgraphia?

## Are all writing problems dysgraphia?

- **YES**, dysgraphia, which is a Greek word meaning impaired **letter** writing by hand, exists and can be defined. **NO**, not all handwriting problems are related to dysgraphia. Handwriting problems are also found in Developmental Motor Disorder and Neurological Injuries. But different treatments are needed for those than for dysgraphia.
- **Learning Profile for Dysgraphia**: Impaired legible and automatic alphabet letter writing (handwriting) (which may interfere with learning to spell and compose), and impaired legible and automatic numeral writing (which may interfere with written math).
- **Phenotype Profile for Dysgraphia**: Impaired orthographic coding (storing letters in mind's eye), sequential finger planning, orthographic loop from letter coding in mind's eye to sequential finger movements to produce letters, and executive functions for supervisory attention.
- **Has research shown there is a genetic basis and brain basis for dysgraphia?** Yes

**Does research show how to define dyslexia?  
Are all reading and spelling problems dyslexia?**

**YES**, dyslexia, a Greek word that means impaired **word reading and spelling**, exists and can be defined. **NO**, not all reading and spelling problems are dyslexia. Some are the result of developmental disabilities or OWL LD.

**Learning Profile for Dyslexia:** Impaired accuracy and/or rate *for oral word reading* (decoding pseudowords and/or word identification of real words), *silent real word reading*, and *spelling*

**Phenotype Profile for Dyslexia:** Impaired phonological coding, orthographic coding, phonological loop, and orthographic loop

**Has research shown there is a genetic and brain basis for dyslexia? yes**

## Does research show how to define OWL LD?

### Are all aural/oral problems OWL LD?

- **YES**, research has shown that some children struggle in learning oral language during the preschool years and then during the school years they struggle in listening to and understanding teacher's instructional talk, reading comprehension of written language in instructional materials, using oral language and written language to express themselves, and using language to learn. **NO**, some children have a developmental disability in language (overall language development or verbal comprehension outside the normal range) or speech (severe articulation problems) or severe hearing problems.
- **Learning Profile for OWL LD**: Impaired listening comprehension, oral expression, reading comprehension, and/or written expression/composition.
- **Phenotype Profile for OWL LD**: Impaired syntactic coding and often morphological coding. Impaired syntactic levels of each of or some of the four language systems (by ear, mouth, eye, and hand) with or without word finding problems.
- **Has research shown a genetic and brain basis for OWL LD? yes**

# Working Memory Phenotype Profiles of 3 SLDs

**Common Lower Level Executive Function Problems** across all 3 SLDs (**Supervisory Attention**).

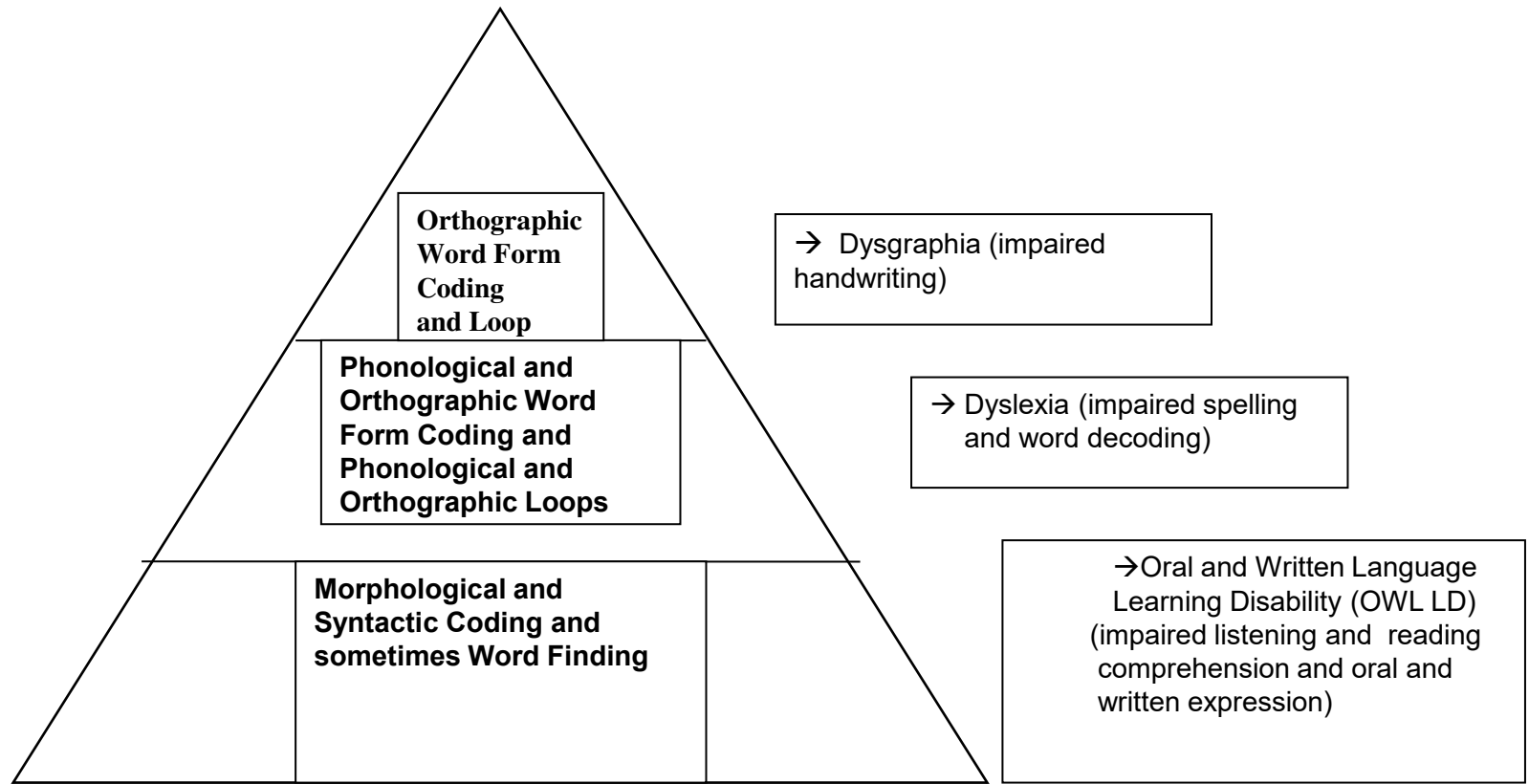
**Orthographic Loop**= Orthographic Coding of Letters/ Words and Sequential Finger Movements

**Phonological Loop**=Phonological Coding of Letters /Words and Sequential Mouth Movements

**Coding**=Storing and Processing Word Forms **Syntax Buffer** Stores and Processes Accumulating Words.

## Phenotype Profiles

## Learning Profiles





# Dysgraphia, Dyslexia, and OWL LD Are All Writing Disabilities

- But they are different kinds of writing disabilities at different levels (units of language)

subword → word → syntax/text:

Handwriting Disability

Dysgraphia

Spelling Disability

Dyslexia

Sentence and Text Composing

OWL LD

- So focus on reading only not sufficient to help students overcome specific learning disabilities—need to also take into account writing and aural/oral language. See next slide for four language systems involved in learning to write.

Figure 9.1 Berninger (2015) Interdisciplinary Frameworks:

# 4 Language Systems (connected to sensory input or motor output systems) and Developmental Domains Used in Ruling Out Developmental Disabilities and Identifying Literacy Learning Profiles

**Attention and Executive Functions:**  
*Mental Government of the Cognitive, Language, SensoriMotor, Social, and Emotional Domains*



### Language By Mouth

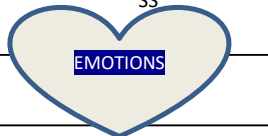
- Subword
- Spoken Words
- Multi-Word
- Text--Multi-Utterances



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### Language By Ear :

- Subword
- Heard Words
- Multi-Word
- Text--Multi-Utterances



### Language By Eye:

- Subword
- Viewed Words
- Multi-Word
- Text--Multi-Sentences



### Language By Hand:

- Subword
- Written Words
- Multi-Word
- Text--Multi Sentences



# Four Multi-Levelled Language Systems

- **Teach to each of the multiple levels of language within each of the four language systems (by ear, mouth, eye, and hand).** Each language system has multiple units at which language can be analyzed, learned, and used: subword, word, and multi-word syntax, and text.
- **Create each of the four functional language systems.** *Teach to each level of a language system close in time to create cross level connections within each functional language system* for language by ear (listening), for language by mouth (oral expression), for language by eye (reading), and for language by hand (writing).
- **Provide instruction and learning activities to teach inter-relationships among the four language systems.** For example, integrated reading-writing, listening-writing, writing-speaking are needed for academic tasks.

# Issues Regarding Executive Functions for Self-Governing Functional Systems

- How can the individual student learn to **self-regulate** each of the four multi-leveled language systems that support language learning and use? See Figure 9.1.
- How can teachers help students learn to **self-regulate** the complexity of the interactions among levels of language within and across functional language systems and their interactions with other functional systems for the cognitive, attention/executive, sensori-motor, social, and emotional developmental domains? See Figure 9.1
- How can teachers help students develop executive functions for **self-regulation (mental self-government)** of working memory components that support language learning and use? See Figures 9.2 and 9.3.

# **Oral Language Matters in Learning to Write**

## **What I Think I Can Say, What I Say I Can Write:**

### **Writing-Reading-Oral Language Intervention Developed by Kindergarten Teacher in Low Income, Low Achieving School**

Jennifer Katahira used this teaching approach every day throughout kindergarten to make connections among the thought world, oral language, writing, reading, and social world.

Teacher modeling thinking Aloud to generate words and sound out and spell those words; Children thinking aloud, using Sunshine Cards to find letter that goes with pictured word that contains each sound in the spoken words expressing their thoughts and using the letters to write those words; and children sharing writing by reading what they composed aloud to writing buddies. They even published a classroom book!

At end of year all kindergartners (but one) were at the 90<sup>th</sup> %tile in reading (that one was at the 70<sup>th</sup> %tile).

**KINDERGARTEN IS NOT TOO EARLY TO START TEACHING WRITING!**

Berninger, V., & Traweek, D. (1991). Effects of two-phase reading intervention on three orthographic-phonological code connections. *Learning and Individual Differences, 3*, 323-338.

Traweek, D., & Berninger, V. (1997). Comparison of beginning literacy programs: Alternative paths to the same learning outcome. *Learning Disability Quarterly, 20*, 160-168.

## Oral Language (Thinking Aloud) Also Matters in Writing during Middle Childhood

- Davidson, M., & Berninger, V. (2017, published January 12; posted on line, 2016, December 21). Thinking aloud during idea generating and planning before written translation: Developmental changes from ages 10 to 12 in expressing and defending opinions. *Cogent Psychology*, 3(1), 1276514. Pages 1 to 16. Published by Taylor Francis  
<http://dx.doi.org/10.1080/23311908.2016.1276514> NIHMS 846177  
Posted on PubMed February 20, 2017  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5305188>
- **Conclusion:** Writing is complex in terms of the processes involved, but if teachers understand these processes and how to teach them, then learning to write can seem simple to developing writers!

## Resources for Practitioners: Books on Writing in Typically Developing Writers and Specific Learning Disabilities Involving Writing

- Berninger, V. W. (2015). *Interdisciplinary frameworks for schools: Best professional practices for serving the needs of all students*. Washington, DC: American Psychological Association.  
<http://dx.doi.org/10.1037/14437-002> Companion Websites with Readings and Resources and Advisory Panel.
- Berninger, V., & Wolf, B. (2016, second printing 2019). *Teaching students with dyslexia, dysgraphia, OWL LD, and dyscalculia: Lessons from teaching and science, Second Edition*. Baltimore: Paul H. Brookes. Also available as e-book.
- Arfé, B., Dockrell, J., & Berninger, V. (Eds.) (2015). *Writing development in children with hearing loss, dyslexia, or oral language problems: Implications for assessment and instruction*. NY: Oxford University Press. Also available as an ebook.

# Resources for Understanding the Cognitive and Neuropsychological Processes in Writing

- Berninger, V. (Ed.) (2012). *Past, present, and future contributions of cognitive writing research to cognitive psychology*. New York: Psychology Press/Taylor Francis Group. See Hayes chapter.
- Fayol, M., Alamargot, D., & Berninger, V. (Eds.) (2012). *Translation of thought to written text while composing: Advancing theory, knowledge, methods, and applications*. New York: Psychology Press/Taylor Francis Group. See Hayes chapter.
- Berninger, V., & Richards, T. (2002). *Brain literacy for educators and psychologists*. New York: Academic Press. Currently distributed by Elsevier.
- Berninger, V. (1994). *Reading and writing acquisition: A developmental neuropsychological perspective*. In Developmental Psychology Series, Wendell Jeffrey Series Editor. Madison, WI: WCB Brown & Benchmark Publishing. Reprinted 1996, Westview Press, Boulder, CO. Distributed by Perseus Books Group. Electronic version available, 2014-present. Beginning 2017 to be distributed by Hachette Book Group [hachette.books@hbgusa.com](mailto:hachette.books@hbgusa.com)
- Berninger, V. (Ed.) (1994). *The varieties of orthographic knowledge I: Theoretical and developmental issues*. Dordrecht, The Netherlands: Kluwer Academic Press. Currently e-book version was distributed by Wiley and now Springer.
- Berninger, V. (Ed.) (1995). *The varieties of orthographic knowledge II: Their relation to phonology, reading, and writing*. Dordrecht, The Netherlands: Kluwer Academic Press. Currently e-book version was distributed by Wiley and now Springer.



# Complexity of Spelling

- Henry, M. (1990) *Words. Integrated Decoding and Spelling Instruction Based on Word Origin and Word Structure*. Pro Ed. Also 2010 edition Paul H. Brookes. Note English words are of Anglo-Saxon, Romance (French and Latinate), and Greek origins which differ in linguistic properties.
- Berninger, V., Fayol, M., & Alamargot, D. (2012). Learning to spell words with the pattern analyzer, oracle, scribe, and silent orthographer. In M. Fayol, D. Alamargot, & Berninger, V. (Eds.). *Translation of thought to written text while composing: Advancing theory, knowledge, methods, and applications* (pp. 71-93). Psychology Press/Taylor Francis Group/Routledge. Note English is a morphophonemic orthography.

# Assessment of Specific Learning Disabilities Involving Writing

- Berninger, V. (2007). *Process Assessment of the Learner, 2<sup>nd</sup> Edition. Diagnostic for Reading and Writing (PAL-II RW)*. San Antonio, TX: The Psychological Corporation. Now Pearson. [www.PAL-II.com](http://www.PAL-II.com)

# Translating Instructional Research into Lesson Plans

Berninger, V. (1998). *Process assessment of the learner (PAL). Guides for intervention. Reading and Writing. Also Handwriting Lessons and Talking Letters*. San Antonio, TX: The Psychological Corporation. Currently distributed by Pearson. Update expected in 2020 or 2021.

Berninger, V., & Abbott, S. (2003). *PAL Research-supported reading and writing lessons. Instructional Manual and Reproducibles*. San Antonio, TX: Harcourt/PsyCorp. Currently distributed by Pearson. Lesson Set 15 draws on on Henry (1990). Update expected in 2020 or 2021.

Berninger, V., & Wolf, B. (2009). *Helping students with dyslexia and dysgraphia make connections: Differentiated instruction lesson plans in reading and writing*. Baltimore: Paul H. Brookes. Spiral book with four units of teaching plans from University of Washington Research Program.

Also see Berninger (2015) and Berninger and Wolf (2016, 2019)