Instruction and Intervention for Dyslexia and Other Reading Disorders

Monica McHale Small, PhD and Barbara Liberi, PsyD

May 2016

STUDENTS REFERRED FOR SUSPECTED SLD IN THE DYSLEXIA PILOT PROGRAM: WHERE DO WE GO FROM HERE?

Dawn Flanagan, Ph.D.

June 20, 2016

Live at PATTAN Harrisburg

Live webinar at PATTAN Pittsburg and MCIU

Act 48 and CE's available

PA's Dyslexia Pilot

- Evidence Based Core Curriculum
- **EARLY** Screening of All Students
- Diagnostic Assessments
- Evidenced Based Interventions Targeting Specific Needs

On Grade Level By Third

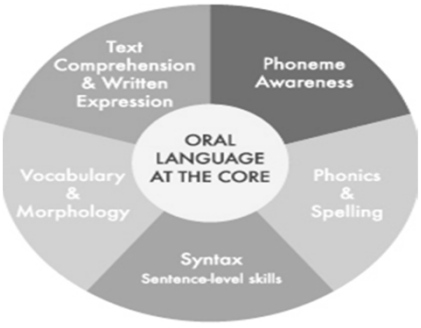
Reading proficiency by third grade is the most important predictor of high school graduation and career success. Yet every year, more than 80 percent of low-income children miss this crucial milestone. ~Campaign for Grade Level Reading

National Reading Panel

- **Phonemic Awareness**: The ability to hear and manipulate sound in words.
- **Alphabetic Principle**: The ability to associate sounds with letters and use these sounds to read words.
- **Automaticity with the Code**: The effortless, automatic ability to read words in connected text.
- **Vocabulary Development**: The ability to understand (receptive) and use (expressive) words to acquire and convey meaning.
- **Comprehension**: The complex cognitive process involving the intentional interaction between reader and text to extract meaning.

Literacy How Model

- Fluency is not a discrete area of focus, rather it is thought of as a critical part of each component.
- Automaticity and fluency is essential in all areas for effective reading. ~M.Gillis



Components of Research Based Instruction in Reading.

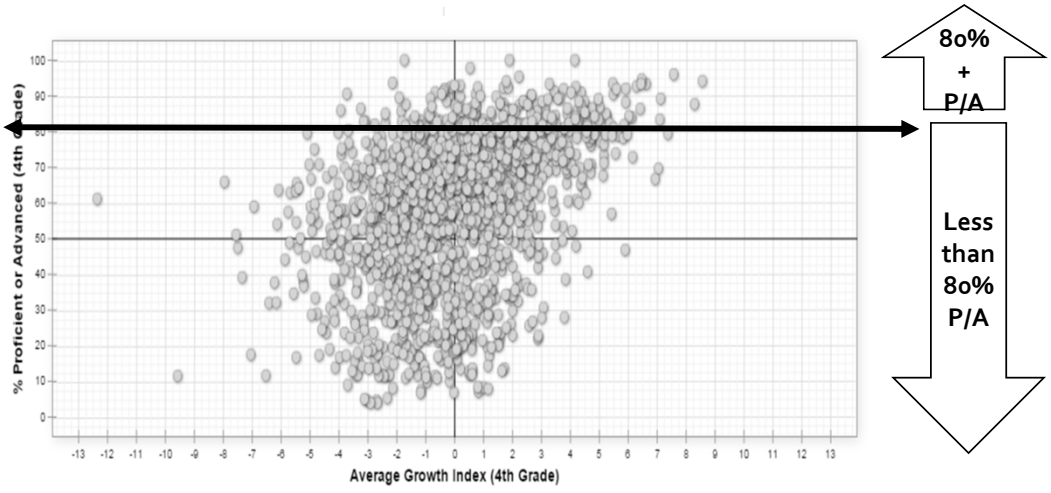
- Reading: all essential components
- Expressive Writing
- Spelling
- Handwriting
- Grammar and Mechanics
- Listening Comprehension
- Oral Language and Vocabulary

The success of early intervention depends in large part on the strength of foundational skills developed through Tier 1 instruction ~Simmons

How Are We Doing With Core Instruction?

- Most recent NAEP results indicate that 31% of fourth grade students in the U.S. are scoring **BELOW** Basic!
- Only 36 Percent of Fourth Grade students are Proficient or above.
- No significant difference in performance since 2013.

How Strong is the Core in PA?



SY 14-15 School Results: ELA Grade 4

Evidenced Based Core Instruction Works

School	3rd Grade ELA PSSA	Econ. Dis	ELL	SpEd
Belmont Hills	82.4	44.8	3.58	15.7

Mastery of Foundational Skills

- Research indicates that mastery of word level reading skill is an accessible goal for most students.
- "Much evidence has now accumulated to indicate that reading itself is a moderately powerful determinant of vocabulary growth, verbal intelligence, and general comprehension ability" (p.239).
- "Print exposure appears to compensate for modest levels of general cognitive abilities …. low ability need not necessarily hamper the development of vocabulary and verbal knowledge as long as the individual is exposed to a lot of print" (p.162).

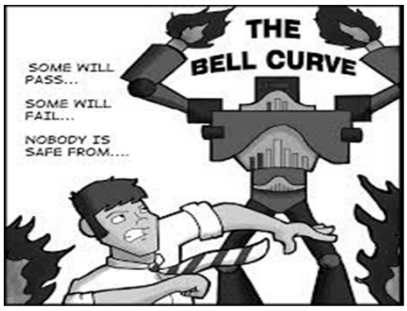
A Thought Shift…

- Failure persists because the U.S, collectively subscribes to the belief that "someone has to fail in school".

  -Duncan-Andrade & Morrell, 2008; Griffin & Morrison, 1997

- The normal curve is an evil thing. In this day and age, where every student needs to learn effectively, we have got to replace the normal-curve mentality with **mastery** learning.

  -Anonymous teacher in Oklahoma



Becoming a Reader Hinges on Word Level Reading Skills

- Being ready for word level reading means having the letter-sound knowledge and phonological awareness skills needed to acquire and apply the alphabetic principle. Without explicit instruction in these skills, most at-risk students will not spontaneously become ready to read (Kilpatrick, 2015).
- Studies have shown that a majority of adolescents who demonstrate unsatisfactory reading skills, struggle with decoding and word recognition (Hock, et. al., 2005 and 2009).
- The older a student gets the more slowly word level skills are acquired, even with intensive, research based intervention.

Screening: An Important But Initial Step

- Reading is a complex construct that requires the synthesis of many skills, abilities, experiences and many types of knowledge.
- The use of screening followed by more in-depth diagnostic assessment leads to better classification accuracy and more targeted intervention planning (Coyne, 2013)
- Catts et al. (2001) and Johnson et al. (2009) found that computing a risk index resulted in greater classification accuracy of a screening process compared with the classification accuracy of single screening measures.
- Increasing evidence that ORF alone has limited classification accuracy and may lead to teachers over-emphasizing fluency in instruction (Pressley, et.al. 2005; Samuels: 2007, Jenkins, 2007)

Use Diagnostic Assessment and Progress Monitoring Data to Adjust Intervention

- The trick is to prevent problems before they occur. Cognitive ability tests can help us prioritize scarce resources so that children most likely to fall behind are better able to keep up and succeed (Schneider, 2016).
- Research by Coyne, et. al. (2013) Reveals a clear and lasting advantage for students who were identified and grouped using diagnostic assessment and who received beginning reading intervention that was adjusted based on their ongoing response and curriculum mastery.

Berninger's PAL II to Screen and Intervene

- **Tier 1** Evidence-Based Screening Measures Linked to Evidence-Based Instruction for Preventing Handwriting, Spelling, Composing, Reading, and Math Problems
- **Tier 2** Evidence-Based Problem Measures Linked to Evidence-Based Assessment-Instruction for Handwriting, Spelling, Composing, Reading and Math Problem Solving Consultation
- **Tier 3** Evidence-Based Differential Diagnosis Linked to Evidence-Based Instruction for Dyslexia, Dysgraphia, and Dyscalculia

Defining Dyslexia

Learning Profile

- Problems in accuracy and rate of oral reading of words and text and pseudowords and/or spelling
- Writing as well as reading disability because spelling problems persist beyond the reading problems and interfere with written composition.
- Reading problems may resolve in elementary grades but writing problems persist and require explicit instruction in writing and reading-writing integration K -12 (and not just accommodations). ~Berninger, 2015

Phonological Coding

- Using letter-sound knowledge to pronounce unfamiliar words. Phonological coding skill can be measured by pseudoword reading skill. ~Kilpatrick, 2015

Orthographic Coding

- Using memory for letter, letter cluster, or whole word to identify a familiar word. Orthographic coding can be assessed by looking at knowledge of irregular/exception words (pint) or homophones (rose vs. rows). ~Kilpatrick, 2015

Instruction for Dyslexia

- Teach procedural knowledge for alphabetic principle in spelling direction (involves subcerebral striatum and basal ganglia pathways) and not just declarative knowledge (involves cerebral pathways)
- Teach students to coordinate phonology, orthography, and morphology (POM POM) because English is a morphophonemic orthography
- Teach to all levels of language close in time (subword, word, syntax, and text)
- Teach for transfer across levels of language. . ~Berninger, 2015

Phonological Processing Deficits

- Aggressively address and correct the students' phonological awareness difficulties and teach phonological awareness to the advanced level.
- Provide phonic/decoding instruction and reinforcement.
- Provide ample opportunity to apply these skills in connected text.
  - Kilpatrick, 2015

Orthographic Processing Deficits

- Direct instruction should address problems related to reduced exposure to text and underdeveloped knowledge of conventional spellings. (Black, 2016)
- Reduce orthographic deficits by encouraging more accurate word and repeated reading connected text.
- Use multisensory technique where the child looks at the word, says word, pronounces word slowly while tracing it, and then writes it from memory.
- Provide extra practice reading/spelling high frequency irregular words using flow list procedure (Mather & Wendling, 2012)
- Provide instruction in common letter sequences, syllable types, orthographic patterns, affixes. (Birsch & Wolf, 2011)

Case Study MARY- Grade 6 Phonological Processing Strengths and Weaknesses and Dyslexia

Mary obtained a scaled score of 12 on CTOPP2 Blending Words- **She has developed some basic phonological awareness skills**. Blending involves **phonological synthesis (putting sounds together).**

Mary did poorly on measures of **advanced phonological and phonemic awareness/analysis tasks**-Deletion and phoneme isolation tasks- Elision –scaled score 5, Phonemic Isolation ss= 7 (**analysis- taking words apart)**

Weaknesses- Word Reading, Decoding skills

There is evidence that blending skills develop sooner than analysis skills and that students can have good blending skills and inadequate reading development.

Case Study Mary

Implications for Intervention- Refer to Kilpatrick (2015) previously discussed.

Aggressive development of phonological awareness (e.g., blending and segmenting) and **advanced phonemic awareness (e.g., manipulating phonemes within words, such as deleting, substituting, and occasionally reversing phonemes. (many of our interventions do not teach advanced phonological analysis skills . Children and adults with dyslexia require this instruction.)**

Phonic decoding instruction and/or reinforcement.

Ample Opportunity to apply these skills in connected text.

These are components of Orthographic Mapping that are necessary for developing automaticity (Kilpatrick, 2015)

Intervention Resources

- **Essentials of Dyslexia Assessment and Intervention,** Nancy Mather & Barbara Wendling
- **Essesntials of Assessing, Preventing and Overcoming Reading Difficulties,** David Kilpatrick
- **Multisensory Teaching of Basic Language Skills,** Third Edition, Beverly Wolf and Judith Birsh

Do SLI/LLD and OWL LD Exist? Are these Disorder a Type of Dyslexia?

- **Yes,** selective language impairment (SLI), language learning disability (LLD), or oral and written language learning disability (OWL LD) (all synonyms) exist in children who are overall within normal range for five domains of development including language, but are impaired in **multi-word** (syntactic and morphological) processing or production.

- **No,** SLI (a.k.a. LLD, OWL LD) emerges during the preschool years and influences academic learning in various ways during the school age years, whereas dyslexia and dysgraphia are first evident during the school age years. However, children with OWL LD may also have co-occurring symptoms of dysgraphia and/or dyslexia. ~Berninger, 2015

More Features of Oral-Written Language LD

- Struggle in learning oral language and then during the school years in using language to learn and understanding teacher's instructional language and written language in instructional materials
- Reading and writing skills are often not discrepant from Verbal Reasoning
- Nonverbal cognition at least within the normal range
- Often faster responders to phonics than dyslexics but persisting real word reading and reading comprehension problems ~Berninger, 2015

Assessment-Intervention for Oral Language

- Practical suggestions for incorporating listening and speaking instruction at each level of language (phonological , vocabulary, syntax , and text) based on Wolf's teaching and professional development experience for structured language instruction

- Berninger, V., & Wolf, B. (2009). *Teaching students with dyslexia and dysgraphia*: *Lessons from teaching and science.* Baltimore: Paul H. Brookes. Reviewed in NASP *Communiqué* Vo, 39, *83*, November 2010, by Pam Abrams.

Executive Function and Reading Comprehension

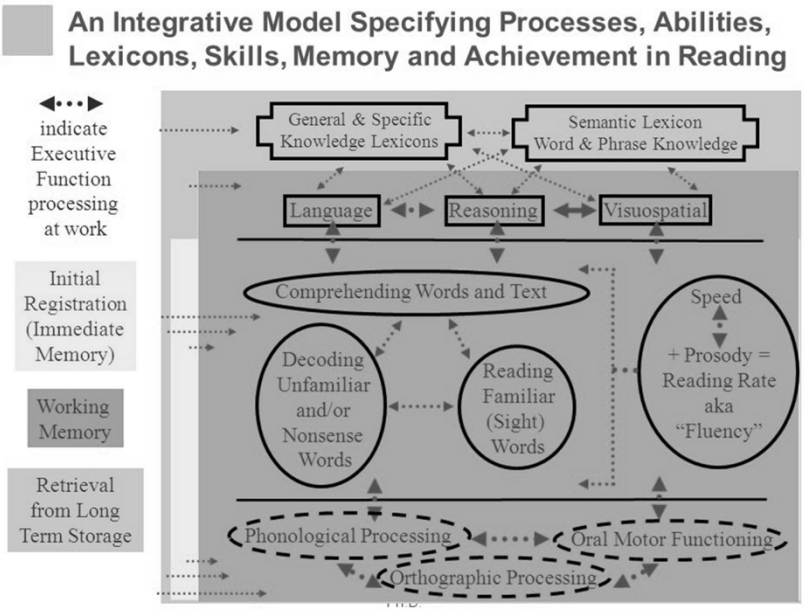
- Thanks to George McCloskey and Laurie Cutting, we are learning more about executive functioning and reading processes including reading comprehension.

- Executive Functions integrate and synchronize the multiple sub-processes involved in reading such as phonological, morphological and orthographic aspects of word reading, retrieval of knowledge and word meanings (lexicons) from long term memory, integrating prior knowledge with new information, pacing our reading; monitoring and deploying comprehension strategies.

(Hecker, L)

EF and Reading

- EF are used to cue, direct, coordinate and integrate all of the processes, abilities and all of the knowledge bases used when reading (McCloskey, 2016)
- The following slide is a model from the work of George McCloskey (2009, 2016).
- The Red Arrows represent Executive Functions.



McCloskey Integrative Model

- As you can see, Executive Functions link all of the abilities, skills, processes, lexicons within a time frame involving initial registration, working memory and long term rertrieval of knowledge and words.

EF and Reading

Examples

1. Cueing sustained attention to orthography
2. Cueing and coordinating

-Phonological and orthographic processes for accurate word pronunciation.

-The use of word recognition, word decoding and reading comprehension skills.

(McCloskey, 2016)

EF and Reading

Examples

3.Cueing and Directing

- Attention and immediate memory for reading words and connected text.

-Oral motor production, prosody.

-The use of strategies for reading words and deriving meaning from text.

(McCloskey, 2016)

EF and Reading

Examples

4. Cueing retrieval of information from lexicons to read words and connected text.

5. Cueing and sustaining working memory resources while reading words and constructing meaning from text.

(McCloskey, 2016)

EF Interventions and Reading Key Concepts

- Improving a student's executive functions in reading starts with increased awareness and goal setting and progresses from external control (teacher) to internal self regulation.
- Orienting strategies increase awareness of executive functions and expectations for their use, and provide self regulation goals for students.
- Importance of External Cueing and Prompts

(McCloskey 2016)

EF Interventions and Reading Comprehension

Provide Explicit strategy instruction that models and teaches the student how to approach the tasks of vocabulary building and reading comprehension.

DE- Direct Explanation-Teachers help students view reading as problem solving that requires the use of strategic thinking. Teachers explain the reasoning and mental processes involved in reading comprehension in an explicit manner.

Facilitate student awareness of and understanding of his/he thinking/cognitive processes that impact instruction and learning. (McCloskey 2016)

Executive Dysfunction Among Children With Reading Comprehension Deficits

Locascio, G. Mahone, M. Eason, S. and Cutting, L. (2010)

RESULTS

WRD vs Controls -After controlling for SES and Severity of ADHD, Children with Word Reading Deficits (WRD) had significantly reduced performance compared to controls on measures of verbal working memory, and response inhibition. The WRD did not differ from controls on measures of Planning/ Spatial Working Memory.

Executive Dysfunction Among Children With Reading Comprehension Deficits

Locascio, G. Mahone, M. Eason, S. and Cutting, L. (2010)

Results

S-RCD vs Controls and WRD- After controlling for SES and severity of ADHD symptoms, children with Specific Reading Comprehension Deficits (S-RCD) has significantly reduced performance on the Planning factor . They has significantly reduced performance on the DKEFS Tower and Spatial Span Backwards. S-RCD made more incorrect moves relative to correct moves than Controls or WRD on the Tower task.

There was a trend toward reduced performance among the S-RCD group Response Inhibition factor when compared to Controls.

There was no significant difference between WRD and S-RCD on Response Inhibition.

Controls and S-RCD were not significantly different on Verbal Working Memory.

Executive Dysfunction Among Children With Reading Comprehension Deficits

Locascio, G. Mahone, M. Eason, S. and Cutting, L. (2010)

Discussion-The DKEFS Tower is a measure emphasizing spatial planning, rule learning and the ability to establish and maintain a an instructional set (this is particularly linked to reading comp.

The most prominent difference on DKEFS appeared to be related to planning errors.

Implication- Results suggest:

That Children with S-RCD may have an inefficiency in the planning and organization needed for a particular task and these deficits may underlie the manner in which children with s-RCD navigate and organize reading material for comprehension.

That a particular type of strategic planning is linked to reading comprehension.

Working Memory in Turn Supports Higher-Order Executive Functions

- Goal Setting
- Making Plans to Reach Goals
- Translating (Cross-Domains)
- Reviewing (Self-Monitoring)
- Revising
- Imagining (envisioning what does not exist)
- Playing (pretending, rearranging, creating)
- Reflecting (metacognition or thinking about…)

~Berninger, 2015

Working Memory Considerations

- Capacity Limitations (how much can be stored or processed)
- Resource Limitations (what other processes can be accessed)
- Timing Limitations (speed or rate or automaticity)

Instruction for Working Memory Architecture

To overcome working memory problems teach:

- **procedural knowledge**: point to/touch letters, name letters and words and say corresponding phoneme close in time, that is, *exercise the phonological loop*, or write letters than correspond to sounds or name, that is, *exercise the orthographic loop*, rather than parrot declarative knowledge (e.g., phonics rules), but *teach for transfer* of procedural knowledge to words and text;
- **teach to all levels of language close in time**;
- **avoid habituation** by not doing the same activity for a long time—vary activities
- **teach reflection** (linguistic awareness)

Does dysgraphia exist? Are all writing problems dysgraphia?

- **Yes,** dysgraphia, which is a Greek word meaning impaired **letter** writing by hand, exists. **No**, not all handwriting problems are related to dysgraphia. Handwriting problems also found in Developmental Motor Disorder. But different treatments are needed.
- **Learning Profile for Dysgraphia**: Impaired legible and automatic letter writing (handwriting) which may interfere with learning to spell and compose and numeral writing, which may interfere with written math.
- **Phenotype Profile**: Impaired orthographic coding, sequential finger planning, orthographic loop from coding to finger movements to produce letters, and executive functions for supervisory attention. ~Berninger, 2015

Different Kinds of Handwriting Problems Require Different Kinds of Treatment

- Typically those with dysgraphia do not qualify for occupational therapy services and need special instruction from a teacher.
- Those who do have developmental motor disorder have handwriting problems for other reasons, do qualify for OT services, and require treatment specialized for specific motor problems or developmental motor problems that occur alone (SDD in motor domain) or with other disorders such as PDD due to neurogenetic or acquired disorders. . ~Berninger, 2015

References

Birsh, J. Ed. (2011) *Multisensory Teaching of Basic Language Skills.* Baltimore, MD: Paul H. Brooks Publishing Company

Black, J. (2016) *Orthographic Processing: A Subcomponent or Subtype of Dyslexia?* Address given at the Cullowhee Conference, Dallas, Texas, April 2016.

Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (2001). Estimating the risk of future reading difficulties in kindergarten children. *Language, Speech, and Hearing Services in Schools, 32,* 38–50.

Coyne, M. D., Simmons, D. C., Hagan-Burke, S., Simmons, L. E., Kwok, O.-M., Kim, M., Rawlinson, D. A. M. (2013). Adjusting beginning reading intervention based on student performance: An experimental evaluation. *Exceptional Children*, *80*(1), 25–44.

Hecker, L. *The Reading Brain: Executive Function Hard at Work* retrieved 5/1/2016 http://ldaamerica.org/the-reading-brain-executive-function-hard-at-work/

Johnson, E. S., Jenkins, J. R., Petscher, Y., & Catts, H. W. (2009). How can we improve the accuracy of screening instruments? *Learning Disabilities Research & Practice.*

Kilpatrick, D.; Alan Kaufman& Nadeen Kaufman, Series Editors (2015) *Essential of Assessing, Preventing, and Overcoming Reading Difficulties*. Hoboken, NJ: John Wiley& Sons, Inc.

Mather, N. & Wendling, B. (2012). ; Alan Kaufman& Nadeen Kaufman, Series Editors (2015) *Essential of Assessing, Preventing, and Overcoming Reading Difficulties*. Hoboken, NJ: John Wiley& Sons, Inc.

References

Pressley, M., Hilden, K., & Shankland, R. (2005). *An evaluation of end-grade-3 Dynamic Indicators of Basic Early Literacy Skills (DIBELS): Speed reading without comprehension, predicting little* (Technical Report). East Lansing, MI: Literacy Achievement Research Center.

Samuels, S. J. (2007). The DIBELS tests: Is speed of barking at print what we mean by reading fluency? *Reading Research Quarterly, 42,* 563–566.

Simmons, D. (2015). Instructional engineering principles to frame the future of reading intervention research and practice. *Remedial and Special Education*, *36*(1), 45– 51.

McCloskey,G. " Interventions for Students with Executive Function Difficulties Directly Related to Reading Problems" Feb, 2016 New Orleans, LA CDL

McCloskey, George. "Executive Functions and Reading: A Neuropsychological Perspective" Webinar Pearson. retrieved 10 Apr. 2016.

McCloskey,G., Perkins, L. & Divner, B. (2009) *Assessment and Intervention for Executive Function Difficulties.* New York: Routledge.

Samuels, S. J. (2007). The DIBELS tests: Is speed of barking at print what we mean by reading fluency? *Reading Research Quarterly, 42,* 563–566.

Simmons, D. (2015). Instructional engineering principles to frame the future of reading intervention research and practice. *Remedial and Special Education*, *36*(1), 45– 51.

STUDENTS REFERRED FOR SUSPECTED SLD IN THE DYSLEXIA PILOT PROGRAM: WHERE DO WE GO FROM HERE?

Dawn Flanagan, Ph.D.

June 20, 2016

Live at PATTAN Harrisburg

Live webinar at PATTAN Pittsburg and MCIU

Act 48 and CE's available

Contact Us With Questions

- Monica McHale-Small: monica.mchale.small@gmail.com
- Barbara Liberi: Bliberi9082@aol.com