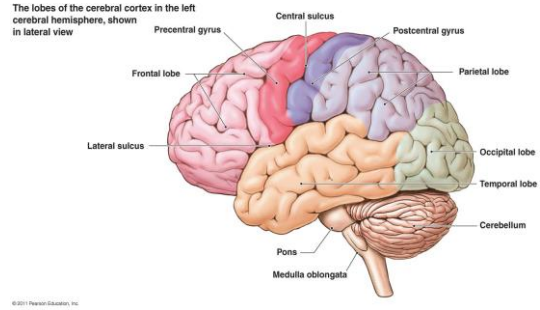
Brain Based Strategies and Interventions to Help Children with Reading and Written Language Disorders



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jack hirose & ASSOCIATES, INC.

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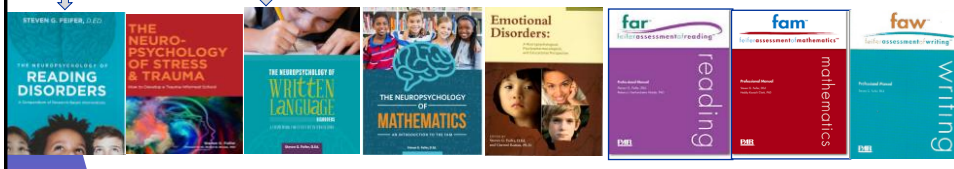
Dr. Feifer's Journey 1992-present

www.schoolneuropsychpress.com



- Nationally certified school psychologist 20+ years
- Diplomate in **pediatric** and **school** neuropsychology
- 2008 **Maryland School Psychologist of the Year**
- 2009 **National School Psychologist of the Year**
- Author: **8 books** on learning and emotional disorders
- Test Author: **FAR-FAM-FAW-FACT**
- Currently in private practice at Monocacy Neurodevelopmental Center in Maryland.

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Presentation Outline

- **Global Literacy at a Glance**
- Defining Dyslexia
- The Discrepancy Dilemma
- Four Universal Truths of Reading
- Subtypes of Reading Disorders and Intervention Strategies
- Assessment Strategies
- Introducing the FAR
- Case Example

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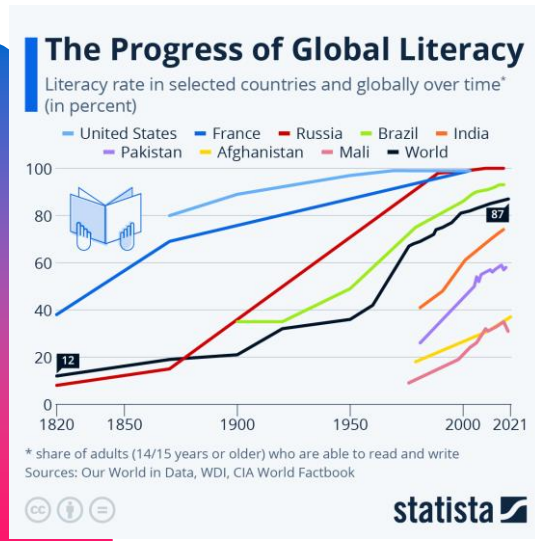
Global Literacy at a Glance
(Statista, 2022)



- 1820 - **12%** literacy rate
- 1900 - **20%** literacy rate
- 1960 - **42%** literacy rate
- 1983 – **70%** literacy rate

- Today – **87%** literacy rate (Levels 1- 6)

- Canada – **99%** literacy rate, though **48%** have literacy skills below High School level.
- **25%** of Grade 3 children in Canada not reading on grade level.

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Global Literacy at a Glance

United Nations Education, Scientific, and Cultural Organization (UNESCO)

- ***'Literacy'*** *is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts (UNESCO).*
- ***'Literacy'*** *is a* ***human right.*** *It reflects both the openness and economic stability of a culture to prioritize education for ALL its citizens.*

- **773 million** adults and children do not have basic literacy abilities with illiteracy highest in South Asia and sub-Saharan Africa.
- The COVID-19 epidemic affected the education of 62.3% of the world's **1.1 billion** students.

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Why Literacy Matters in Canada

- **Civic Engagement:** People's belief that they can engage in, understand and influence political affairs rises with increased education and skills. Among Canadians with less than a high school diploma, just **32%** report this belief, compared to **60%** of people who have obtained a bachelor's degree or higher.
- **Economy:** High literacy in Canada helps build an educated and skilled workforce which contributes to the country's economic growth.
- **Work:** Canadians with low literacy skills are twice as likely to be unemployed than those with higher level literacy skills.
- **Health:** Canadians with the lowest levels of literacy are more than **twice** as likely to be in poor health compared to Canadians with higher literacy skills.
- **Poverty**: In Canada, **46%** of adults at the lowest literacy levels live in low income households, compared with **8%** of adults at the highest literacy levels.
- **Family:** Reading to children before they start school helps develop their language skills and interest in reading and learning. Children of parents with higher education levels have higher literacy levels.

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Literacy in Canada: Public Opinion Survey (2024)

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Literacy in Canada: Pre-pandemic

Program for International Student Assessment (2018)

Canadian results in reading over time, 2009–2018

	2009		2012		2015		2018	
	Average score	Standard error	Average score	Standard error	Average score	Standard error	Average score	Standard error
Canada	524	(1.5)	523	(3.2)	527	(4.1)	520	(4.0)
Newfoundland and Labrador	506	(3.7)	503	(4.5)	505	(4.9)	512	(5.6)
Prince Edward Island	486	(2.4)	490	(3.7)	515*	(7.0)	503	(9.0)
Nova Scotia	516	(2.7)	508	(4.0)	517	(6.0)	516	(5.2)
New Brunswick	499	(2.5)	497	(3.7)	505	(6.3)	489	(5.0)
Quebec	522	(3.1)	520	(4.4)	532	(5.8)	519	(5.0)
Ontario	531	(3.0)	528	(5.1)	527	(5.6)	524	(5.0)
Manitoba	495	(3.6)	495	(4.2)	498	(6.0)	494	(4.9)
Saskatchewan	504	(3.3)	505	(3.8)	496	(4.9)	499	(4.6)
Alberta	533	(4.6)	525	(4.8)	533	(6.2)	532	(5.5)
British Columbia	525	(4.2)	535	(5.2)	536	(6.5)	519	(5.7)

* Significant difference compared with baseline (2009)
Note: The linkage error is incorporated into the standard error for 2012, 2015, and 2018.

*487 International Reading Average-79 countries
* 22,500 students -800 schools participated
*Includes anglophone and francophone school systems
- Canada mean =520 (Tied 8th) /U.S. mean=505

Organisation for Economic Cooperation and Development (OECD)

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Literacy in Canada: Post Pandemic

Program for International Student Assessment (2022)

Table 3.16

Canadian and provincial average scores in reading over time, 2018–2022

	2018		2022	
	Average score	Standard error	Average score	Standard error
Newfoundland and Labrador	512	(4.3)	478*	(7.2)
Prince Edward Island	503	(8.3)	496	(10.4)
Nova Scotia	516	(3.9)	489*	(6.4)
New Brunswick	489	(3.5)	469*	(4.3)
Quebec	519	(3.5)	501*	(4.9)
Ontario	524	(3.5)	512*	(4.1)
Manitoba	494	(3.4)	486	(4.1)
Saskatchewan	499	(3.0)	484*	(4.3)
Alberta	532	(4.3)	525	(6.4)
British Columbia	519	(4.5)	511	(6.0)
Canada	**520**	**(1.8)**	507*	**(2.5)**

- Reading scores in Canada **(507)** declined **13** points.
- Average decline among 81 countries **10** points (**476** avg).
- Newfoundland and Nova Scotia biggest decline.
- More than 23,000 students from 850 schools participated.

Organisation for Economic Cooperation and Development (OECD)

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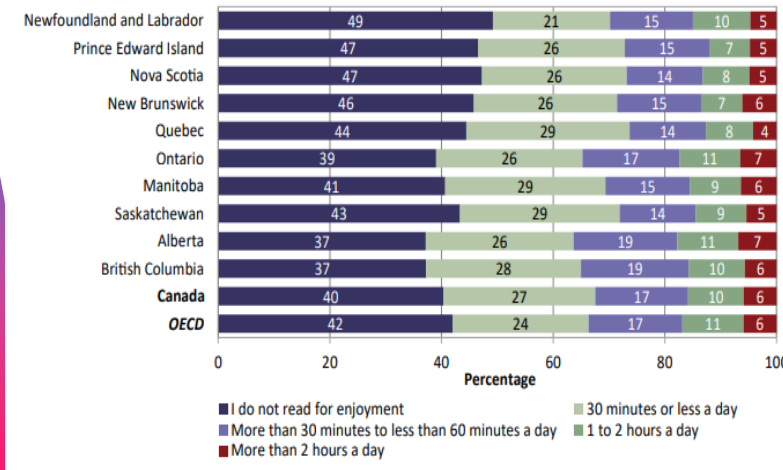
Literacy in Canada

Program for International Student Assessment (2018)

Percentage of students by time spent reading for enjoyment



Note: Percentages may not add up to 100 due to rounding.

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Case Example

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What is a Learning Disability?

LEARNING DISABILITY (Grades 1–12: Code 54)

This is the official definition adopted by the Learning Disabilities Association of Canada (LDAC) on January 30, 2002.

"Learning Disabilities" refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency.

Learning disabilities result from impairments in one or more processes related to perceiving, thinking, remembering or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g., planning and decision-making).

Learning disabilities range in severity and may interfere with the acquisition and use of one or more of the following:

- oral language (e.g., listening, speaking, understanding)
- reading (e.g. decoding, phonetic knowledge, word recognition, comprehension)
- written language (e.g., spelling and written expression)
- mathematics (e.g., computation, problem solving).

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Prevalence of LD in Canada

- More Canadian children have a **learning disability** than all other types of educational disabilities combined.
- According to Statistics Canada, **3.2%** of Canadian children have a learning disability – whereas up to **20%** may have **dyslexia**.
- More than half a million adults in Canada live with a **learning disability,** making it more challenging for them to learn in universities, and on the job.
- Research from the Literacy and Policing Project indicates that 65% of incarcerated population in Canada reads at less than a grade 8 level of literacy
- Dyslexia symptoms occur in up to **5-17%** of the population (Munzer et al., 2020).

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Defining Dyslexia??

- **IDA** –deficits in accurate and/or fluent word recognition, decoding, spelling, with secondary effects on reading comprehension.
- **ICD-11**- dyslexia is a *developmental learning disorder* characterized by deficits in word recognition, decoding, and fluency. These difficulties must be present for at least **6 months** despite appropriate instruction, and interfere with academic achievement.
- **WHO** – a neurodevelopmental disorder hindering the acquisition of reading that cannot otherwise be explained by IQ, academic opportunities, motivation, or specific sensory acuity.
- **IDEA** - a learning disability is a basic disorder of a psychological process used in understanding oral, spoken, or written language, and may manifest in the imperfect ability to listen, think, speak, read, write, spell, or do math. It may include conditions such as **dyslexia.**
- **DSMV** – dropped the term and classifies reading issues under the generic term of *specific learning disorder in reading*. The reading issues must have persisted for 6 months and **discrepant** from IQ, age, and/or educational level.

*20% of states **prohibit** using a discrepancy model!!

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Defining Dyslexia

- *"Dyslexia is characterized by difficulties with **accurate** and / or **fluent** word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the p**honological component** of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. **Secondary consequences** may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge."*

  - International Dyslexia Association

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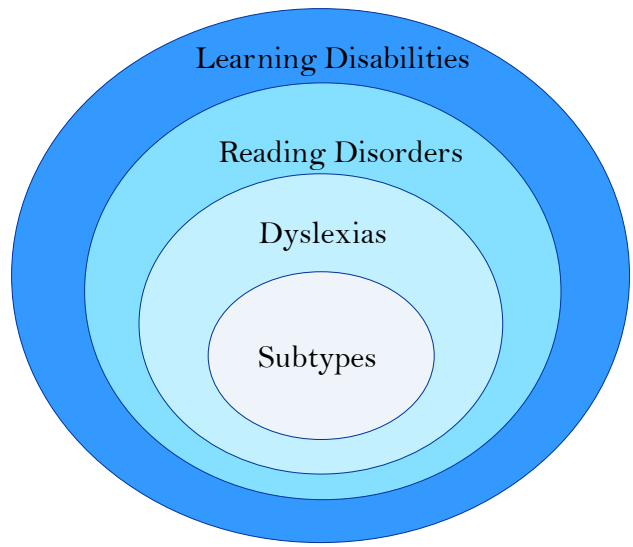
Developmental Dyslexia



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Main Pitfalls of Discrepancy Model

1. Using **Full Scale IQ** scores to determine learning disabilities penalizes low SES kids and minorities (Naglieri & Ortero, 2018).
2. A discrepancy model of reading disabilities precludes early identification.
3. A discrepancy model promotes a *'wait and fail'* policy, forcing interventions to come after the fact.
4. Intelligence is more a predictor of school success, and not necessarily a predictor of successful reading.

❖ Canadian definition of LD requiring *average* abilities for thinking and reasoning should be modified to *adequate* abilities to differentiate from an intellectual disability.

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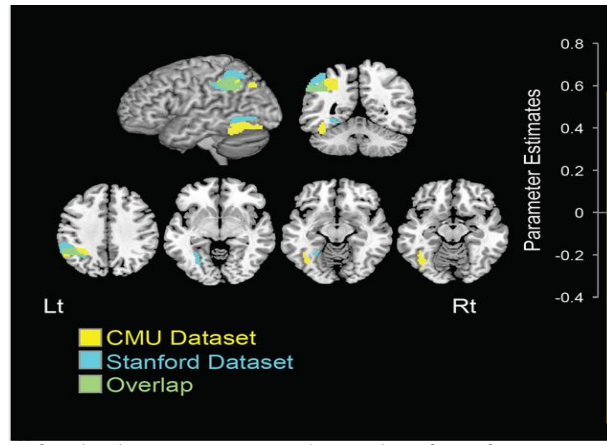
Tanaka, H. et al. (2011). *The Brain Basis of the Phonological Deficit in Dyslexia is Independent of IQ.* Psychological Sciences, 22(11): 1442-1451



- Reduced activation seen among 57 (8-12yo) students from Carnegie Mellon and 74 students from Stanford (7-16yo) in discrepant AND non-discrepant readers in left parietal and visual word form area.
- IQ is not a factor in phonological processing!!
  (Siegal, 1991: Fletcher, et al. 1994; Stanovich, 2005: Shaywitz, 2010).

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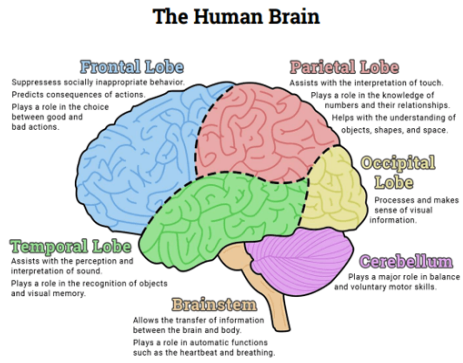
School Neuropsychology

- ***Neuropsychology:*** An analysis of learning and behavior which examines *brain-behavior* relationships. The underlying assumption is that the brain is the seat of ALL behavior; therefore, knowledge of cerebral organization should be the key to unlocking the mystery behind most academic tasks.



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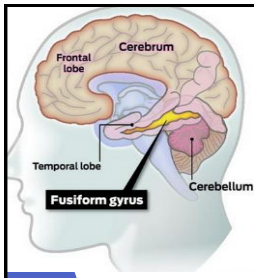

Is Reading a Form of Synesthesia?

Duke Ellington Billy Joel Pharrell Williams

- **Synesthesia** – cross wiring of senses. These musicians hear colors.
- **Exaptation** – the brain is evolving to learn modern tasks including reading (Stephen Jay Gould, 1982; DeHaene, 2013).

**Reading involves hearing symbols echo in the brain.
Is dyslexia is a failure to become a synesthete?

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Four Universal Truths of Reading

1. In all word languages studied to date, children with developmental reading disorders (dyslexia) primarily have difficulties in identifying, recognizing, categorizing, and/or manipulating phonological units at all linguistic levels (Goswami, 2007).

Screening for Success (Hulme & Snowling, 2016)

1. Phonological awareness skills.
2. Ability to link sounds with letters.
*3. Rapid letter-naming skills?
   a) Rapid naming of letters better than objects (Kilpatrick, 2015)
   b) Rapid naming of letters is moderately correlated with reading performance (.28-.57%) and explains some of the reading variance independent of phonological awareness (Truong et al., 2019).

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Four Universal Truths of Reading

2. The English language *is not* a purely phonological!

- 1 letter grapheme: c a t. The sounds **/k/** is represented by the letter **'c'.**
- 2 letter grapheme: l ea f. The sound **/ee/** is represented by by the letters **'e a'.**
- 3 letter grapheme: n igh t. The sound **/ie/** is represented by the letters **'i g h'.**
- 4 letter grapheme: th r ough. The sound **/oo/** is represented by the letters **'o u g h'.**

- The English language includes over **1,100** ways of representing **44** sounds using a series of different letter combinations (Uhry & Clark, 2005). In Italian there is no such ambiguity as just **33** graphemes are sufficient to represent the **25** phonemes.
- Therefore, **25%** of words are phonologically irregular (i.e. "debt", "yacht", "onion", etc..) or have one spelling but multiple meanings –*homonyms*- (i.e. "tear", "bass", "wind", etc.)
- *Summary*: We need to develop **orthography!!**

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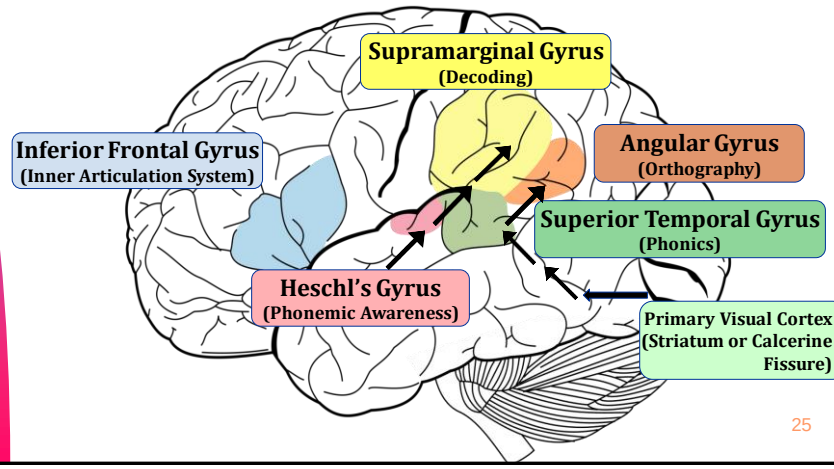
The Reading Brain: How Words are Assembled

3. Specific neuroimaging techniques have demonstrated that **phonological** processing and **orthographic** processing are a by-product of the functional integrity of the *temporal-parietal* junctures in the left hemisphere of the brain (Paz-Alonso et al., 2018; Glezer et al., 2016;Sandak et al., 2004; McCandliss & Noble, 2003).



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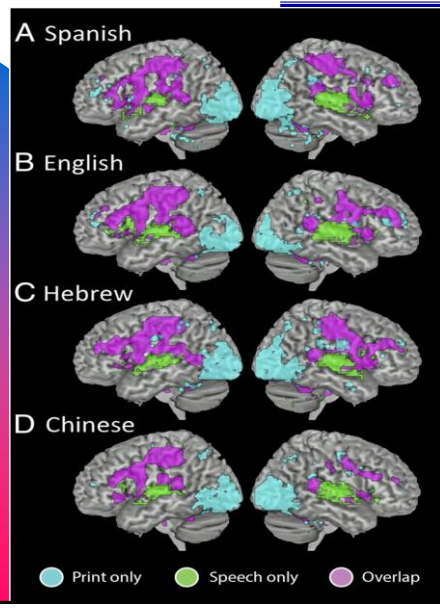
A Universal Reading Brain

Rueckl et al., (2015). Universal brain signature of proficient reading: Evidence from four contrasting languages. **Proceedings of the National Academy of Sciences**; 112(50): 15510–15515



- Proficient reading entails the convergence of phonological and orthographic processing systems onto a common network of neural structures dominated by the left perisylvian regions of the brain.
- Dyslexics in transparent orthographic systems, such as Spanish, German, Italian, Greek have difficulty in acquiring reading speed as a hallmark deficit of dyslexia (Ziegler et al., 2003; Davies et al., 2007; Constantinidou & Stainthorp, 2009; Wimmer et al., 2010).

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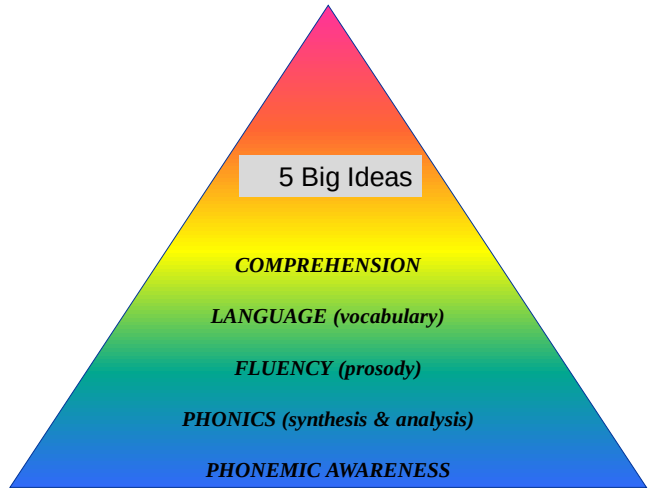
Four Universal Truths of Reading

4. According to the National Reading Panel (2000), and modified by Grizzle et al. (2009), the 5 big ideas of the reading process include:



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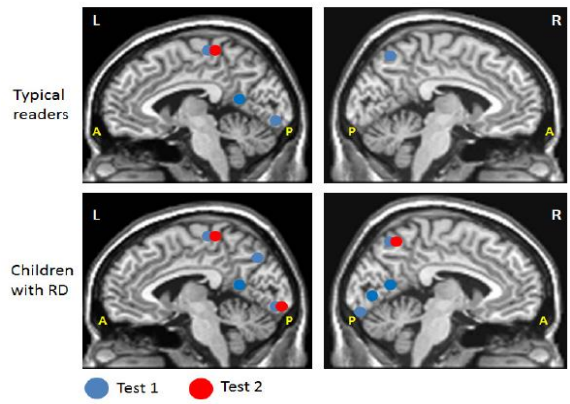
Do Interventions Change the Brain?

- Horowitz-Kraus, T., Vannest, J.J., Kadis, D., Cicchino, N., Wang, Y.Y. & Holland, S. K.(2014). Reading acceleration training changes brain children with reading disorders. *Brain and Behavior*, 886-902.
- 33 children with reading disorders 8-12 years-old.
- RAP training…4 weeks…20 min daily….fluency and comprehension
- Computer presentation of sentences…which dissipate based on response accuracy…and students select correct answer.



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Four Subtypes of Reading Disorders

(1) Dysphonetic Dyslexia – difficulty sounding out words in a phonological manner.

(2) Surface Dyslexia – difficulty with the rapid and automatic recognition of words in print.

(3) Mixed Dyslexia – multiple reading deficits characterized by impaired phonological and orthographic processing skills. Most severe form of dyslexia.

(4) Comprehension Deficits – mechanical side of reading is fine but difficulty persists deriving meaning from print.

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Subtypes of Dyslexia

1. **Dysphonetic Subtype** - great difficulty using phonological route in reading, so visual route to lexicon is used. These readers do not rely in letter to sound conversions, but rather over-rely on visual cues to determine meaning from print.

Neuropsychological Significance: Left temporal-parietal gradient *(supramarginal gyrus)*.

Target Word:	Read As:
cat	*couch*
balloon	*ball*
jump	*gym*
ghost	*goat*

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Remediation Strategies for Dysphonetic Dyslexia

Over Age 12:	**Wilson Reading System**
	SRA Corrective Reading & REACH System
(Top- Down)	**Read 180**
	HOSTS
	Kaplan Spell/Read
	LEXIA Strategies for Older Students
Ages 7 - 12:	**ASDEC Language Foundations (Orton-Gillingham)**
	SRA Corrective Reading
	Earobics II
	LiPS
	LEXIA Primary Reading
(Bottom-Up)	**Horizons**
Under Age 7:	**Fast Forword II(Tallal)**
	Earobics I
	Phono-Graphix
	Saxon Phonics Program
	Success for All
	Ladders to Literacy
	Fundations
	Road to the Code
	SIPPS
	Scott Foresman Early Intervention Reading

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The Morphological Connection ("Top-Down")

Morpheme- the smallest meaningful component of a word that still conveys meaning. Examples include:

Prefixes: ***ante, extra, mis, para, pre, retro, super***
Suffixes: ***able, tion, ment, ness, ship, tude, ward, ible***
Latin Roots: ***cent, extra, hemi, meta, therm, ultra***

- Research suggests that children learn to anticipate words through a combination of phonological, orthographic, and morphological strategies (Senechal & Kearnan, 2007).

- Knowledge about **morphological awareness** contributes to individual differences in reading and spelling that cannot be entirely attributed to orthographic and phonological processing.

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Wilson Reading System

- Designed specifically for **adolescents** and **adults** with dyslexia. Also, very appropriate for **ELL** students.
- Recommended 4-5 days per week…45 -90 min per day.
- Emphasis is on six **syllable subtypes**:

a) Closed syllables (just one vowel…**"cat")**
b) Open syllables (ends in long vowel…**"baby")**
c) Vowel-Consonant E Syllables (silent e elongates vowel…**"make")**
d) Vowel-Team Syllables (two vowels make one sound…**"caution")**
e) R-Controlled Syllables (vowel followed by "r"changes sound…**"hurt")**
f) Consonant-le Syllables (end of word ending in "le"…..**"turtle**")

- Students create their own diacritical markers.
- Students rely upon finger tapping to learn syllable boundaries.
- Comprehension component does not rely upon metacognitive strategies, but rather **visualization.**

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Subtypes of Dyslexia

2. Surface dyslexia - an over-reliance on sound symbol relationships as the process of reading never becomes automatic. These children break every word down to its phonological base, and read slowly due to poor **orthographic** perception and processing.

WORD	READ AS
island →	izland
grind →	grinned
listen →	liston
begin →	beggin
lace →	lake

- Extreme difficulty reading words where phonemes and graphemes are not in 1 to 1 correspondence: **yacht**
  debt

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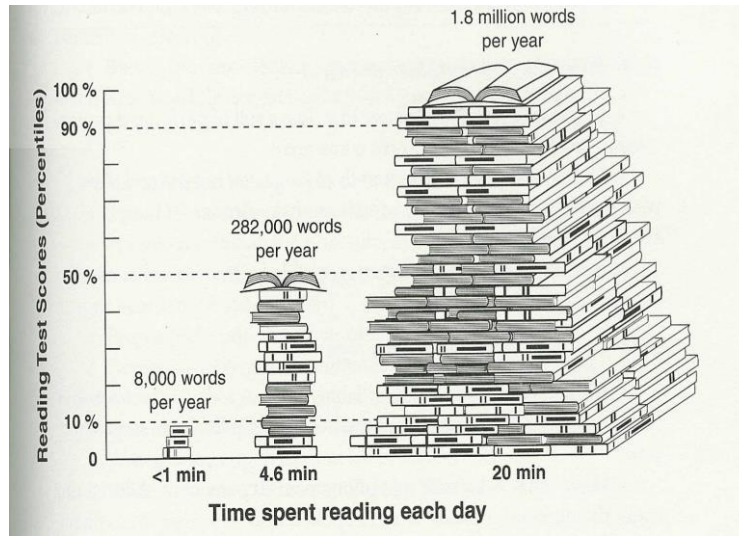
Time Spent Reading After School

(Shaywitz, 2003)



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Remediation of Surface Dyslexia

Over Age 12:
Academy of Reading
Wilson Reading System
Laubauch Reading Series
Read 180

Ages 7 - 12:
Read Naturally
Great Leaps Reading
Quick Read
RAVE-O
Fast Track Reading

Under Age 7:
Destination Reading
Reading Recovery
Early Success
Fluency Formula

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Read Naturally

- A fluency based program designed to develop speed, accuracy, and proper expression.
- Designed to be used 3 times per week…30 minutes, mainly for students between 2nd (51wpm) though 8th (133 wpm) grades.
- Each level of the program has 24 non-fiction stories.
  a) Student placed in level and goal is set.
  b) Cold read for one minute graphing wpm and identifying difficult words.
  c) Read with tape three times consecutively.
  d) Hot read is attempted.
  e) Comprehension questions involve main idea, details, vocabulary, inferences, and short answers.

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Does Vision Therapy Work?

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

FROM THE AMERICAN ACADEMY OF PEDIATRICS

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

Joint Statement—Learning Disabilities, Dyslexia, and Vision

AMERICAN ACADEMY OF PEDIATRICS, SECTION ON OPHTHALMOLOGY, COUNCIL ON CHILDREN WITH DISABILITIES
AMERICAN ACADEMY OF OPHTHALMOLOGY
AMERICAN ASSOCIATION FOR PEDIATRIC OPHTHALMOLOGY AND STRABISMUS
AMERICAN ASSOCIATION OF CERTIFIED ORTHOPTISTS

KEY WORDS
learning disabilities, vision, dyslexia, ophthalmology, eye examination

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abstract

Learning disabilities, including reading disabilities, are commonly diagnosed in children. Their etiologies are multifactorial, reflecting genetic influences and dysfunction of brain systems. Learning disabilities are complex problems that require complex solutions. Early recognition and referral to qualified educational professionals for evidence-based evaluations and treatments seem necessary to achieve the best possible outcome. Most experts believe that dyslexia is a language-based disorder. Vision problems can interfere with the process of learning; however, vision problems are not the cause of primary dyslexia or learning disabilities. Scientific evidence does not support the efficacy of eye exercises, behavioral vision therapy, or special tinted filters or lenses for improving the long-term educational performance in these complex pediatric neurocognitive conditions. Diagnostic and treatment approaches that lack scientific evidence of efficacy, including eye exercises, behavioral vision therapy, or special tinted filters or lenses, are not endorsed and should not be recommended. *Pediatrics* 2009;124:837–844

BACKGROUND

Reading is the process of extracting meaning from written symbolic characters. In elementary school, a large amount of time and effort is devoted to the complicated task of learning to read. Because of the difficulties that some children experience with learning to read, Congress mandated that the Eunice Kennedy Shriver National Institute of Child Health and Human Development assemble a national panel of educators and scientists to review the literature to research the optimal methods of teaching children to read. The 2000 report of the National Reading Panel titled "Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction"[1] linked research findings with recommendations for specific approaches to teaching reading to all children.

Learning disabilities remain a concern for the children and families involved and for the public. The inability to read and comprehend is a major obstacle to learning, which may have long-term educational, social, and economic consequences. Depending on the definition, cho-

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Subtypes of Dyslexia

3. **Mixed Dyslexia** - severely impaired readers with characteristics of both **phonological** deficits, as well as **orthographical** deficits. These readers have no usable key to unlocking the reading and spelling code. Very bizarre error patterns observed.

WORD	READ AS:
Advice	**Exvices**
Correct	**Corex**
Violin	**Vilen**
Museum	**Musune**
Possession	**Persessive**
Material	**Mitear**

- Multiple breakdowns along many reading pathways. 40

4 Remediation Strategies for Mixed Dyslexia

(1) **Multiple Programs** - An eclectic and approach capitalizing on the particular strengths of the child. Consider using a multi-sensory type of **Orton-Gillingham** program, coupled with a fluency model such as **Read Naturally,** and the computerized models of **Read 180**.

(2) **Top Down Strategies** – Often atypical development mapping individual sounds to the visual word form association areas.

(3) **Socioeconomic Status** - is a very strong predictor of reading skills due primarily to the home literacy environment. Therefore, schools need to provide more reading opportunities.

(4) **Motivation and Confidence** –Great Leaps, Read Naturally, etc. tend to give immediate feedback.

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Read 180 (Dr. Ted Hasselburg)

- A **90 minute** per day balanced literacy program.
- Designed for grades 4^{th} – 12^{th}.

1) **20 minute** whole group instruction where teachers model fluent reading skills.
2) Students then move to three-20 min stations.
   a) **Teacher Station** – small group differentiated instruction to reinforce previous concepts.
   b) **Computer Station**:
      - *Reading Zone (phonics, fluency, vocab)*
      - *Word Zone (automaticity of decoding)*
      - *Spelling Zone*
      - *Success Zone (comprehension strategies)*

   c) Library Station – *read silently and written language activities.*

- Software adapts level of instruction to learner.
- Expensive, but research based…recommended for most struggling readers.

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4 Components of Reading Comprehension

1. **Content Affinity** - attitude and interest toward specific material.

2. **Working Memory** - the ability to temporarily suspend information while simultaneously learning new information. The amount of memory needed to execute a cognitive task.

3. **Executive Functioning** - the ability to self-organize verbal information to facilitate recall.

4. **Language Foundation** – vocabulary knowledge is vital for passage comprehension.

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Reading Comprehension Interventions

1. **Stop & Start Technique** – student reads a passage out loud and every 30 seconds "stop" to ask questions.
2. **Directional Questions** – ask questions at the beginning of the text instead of the end.

3. **Read Aloud** – reading out loud allows student to hear their own voices and facilitates working memory.

4. **Story Maps** – pre-reading activity where graphic organizers are used to outline and organize the information.
5. **Active Engagement** – encourage active, not passive reading, by having children take notes or putting an asterisk next to important information. Also, multiple colors for highlighting.

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SOAR to SUCCESS

- A comprehension program for grades 3-6.
- 30-35 minute lessons…18 weeks.
- **4 Key Strategies:**
  - a) Summarize
  - b) Clarify
  - c) Question
  - d) Predict

*** 5 Key Aspects of Program.**

1) Revisiting – re-read previous story with a partner.
2) Reviewing – graphic organizer used to summarize.
3) Rehearsing – preview text and make predictions of book to be read that day.
4) Read and Reciprocal Teaching – silent reading and practicing strategies.
5) Reflecting – discussing story.

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Lindamood Visualization and Verbalization for Language Comprehension and Thinking

- Created by Nanci Bell
- Recommended 3-5 times per week for 60 minutes.
- 12 week program- whole class or individual.
- Based upon 12 structure words *(i.e. what, size, color, shape, etc..)* used to provide a framework to create visual images. The student begins with picture imaging, word imaging, sentence imaging, multiple sentence imaging, and paragraph imaging.
- Pacing is determined by student progress.
- Researched based (Johnson-Glenberg, 2000;Sadoski & Wilson, 2006).
- Consideration for students with Autism, Hyperlexia, ELL, and students with lower verbal abilities.

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Presentation Outline

Global Literacy at a Glance
Defining Dyslexia
The Discrepancy Dilemma
Four Universal Truths of Reading
Subtypes of Reading Disorders and Intervention Strategies
➡ **Assessment Strategies**
Introducing the FAR
Case Example

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3 Models of SLD Assessment

1. Discrepancy Model – SLD is derived from a significant discrepancy between a student's IQ and their overall score on an achievement test.

Criticisms: *Over-reliance on a Full Scale IQ to capture the dynamic properties of learning, the statistical impreciseness of the method, inability to identify young learners (Feifer, 2018), and bias towards culturally different backgrounds (Naglieri & Otero, 2017).*

2. Response to Intervention (RtI) – SLD is derived by **default**, and determined when a student fails to adequately respond to interventions delivered with fidelity over time using a multi-tiered model of support services.

Criticisms: *RtI method lacks reliability to consistently identify specific learning disabilities in children (Maki et al., 2017). In addition, much of the research on RtI involves basic reading skills only.*

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3 Models of SLD Assessment

3. Patterns of Strengths and Weaknesses (PSW) – SLD determination involves a complete assessment of a variety of cognitive processes as well as academic achievement. A pattern of cognitive and academic strengths and weaknesses should emerge.

Criticisms: *Excessive time, huge testing battery required, statistical impreciseness of crossing batteries with different samples to derive constructs, and over-relying on computer programs to interpret tests and not the test publisher (McGill et al. 2018).*

***SOLUTION:** **DIAGNOSTIC ACHIEVEMENT TESTS BASED UPON NEUROPSYCHOLOGY!**

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Presentation Outline

Global Literacy at a Glance
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Assessment Strategies
➡ **Introducing the FAR**
Case Example

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Steven G. Feifer, D.Ed., ABPdN

- A **neurodevelopmental** assessment of reading
- Pre-K to College (Ages 4-21)
- Normative sample included 1,074 students
- 15 subtests in complete battery
- Diagnoses **4 subtypes** of reading disorders
- Includes the FAR-S dyslexia **screening** battery
- Total Far index score and 4 Reading index scores

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FAR Test Review

Test Review

Journal of Psychoeducational Assessment
1-6

A Review of the Feifer Assessment of Reading (FAR)

S. G. Feifer and R. G. Nader

Reviewed by: Jennifer M. Johnson, Elizabeth B. Meisinger, and Melissa F. Robinson, The University of Memphis, TN, USA
DOI: 10.1177/0734282918810328

Test Description

General Description

The Feifer Assessment of Reading (FAR; Feifer & Nader, 2015) is a comprehensive reading test that is individually administered to children and adults aged 4 to 21 years. The structure of the FAR is based on a gradient model of brain functioning (Goldberg, 1990; Luria, 1980) and reflects a neuropsychological approach to reading. This instrument is designed to detect the presence of a reading disorder by examining the cognitive and linguistic processes that support proficient reading. According to the authors, the FAR is unique because it allows for the identification of four specific reading disorder subtypes including surface dyslexia, dysphonetic dyslexia, mixed dyslexia, and a reading comprehension deficit. The FAR is comprised of 15 subtests that yield a Total Index (TI) and four indexes: the Phonological Index (PI), the Fluency Index (FI), the Mixed Index (MI), and the Comprehension Index (CI; see Figure 1). A Screening Form consisting of the one subtest from the PI, FI, and CI is also available.

Administration, Scoring, and Interpretation

Users of the FAR must be trained in psychological assessment procedures and familiar with measurement theory and psychometrics to administer, score, and interpret test results. The Professional Manual provides a detailed description of the administration, scoring procedures, and interpretation guidelines. The instructions and other essential information are provided in the examiner record booklets. Materials needed for administration include three stimulus books, a storybook, an examinee response form, an examiner record form, a pencil or pen, and a stopwatch. The examinee's grade level determines the number of subtests administered and the approximate completion time. Specifically, preschoolers are administered eight subtests (~ 35 min), kindergarten to Grade 1 students are administered 11 subtests (~ 60 min), and those in Grade 2 to college are administered 14 subtests (~ 75 min). Administration of the Screening Form requires 15 min, and the same three subtests are used across all grades levels. General test guidelines (e.g., start, stop, and reverse rules) are used during administration.

The FAR yields grade-based standard scores ($M = 100$, $SD = 15$) for each subtest and index, as well as confidence intervals, percentile ranks, stanine, z score, and normal curve equivalents for index scores. Age and grade equivalents are available for each subtest; however, consistent with professional standards, the authors suggest caution in interpreting those

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Index	Subtest	Grade range	Approximate administration time in minutes
Phonological Index (PI)	**Phonemic Awareness (PA)**	PK to college	5 to 10
	Nonsense Word Decoding (NWD)	Grade 2 to college	2
	Isolated Word Reading Fluency (ISO)	K to college	1
	Oral Reading Fluency (ORF)	K to college	2 to 3
	Positioning Sounds (PS)	PK to college	3 to 4
Fluency Index (FI)	**Rapid Automatic Naming (RAN)**	PK to college	2
	Verbal Fluency (VF)	PK to college	2
	Visual Perception (VP)	PK to college	1
	Orthographical Processing (OP)	K to college	8
	Irregular Word Reading Fluency (IRR)	Grade 2 to college	1
Comprehension Index (CI)	**Semantic Concepts (SC)**	PK to college	5 to 8
	Word Recall (WR)	PK to college	4
	Print Knowledge (PK)	PK to Grade 1	4
	Morphological Processing (MP)	Grade 2 to college	7
	Silent Reading Fluency (SRF)	Grade 2 to college	8

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➡ **Case Example**

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Maxwell 3rd grade: Reading & Writing Issues

WISCV Domains	COMPOSITE SCORE	RANGE	PERCENTILE RANK
Verbal Comprehension Index	93	Average	32%
Visual Spatial Index	84	Below Average	14%
Fluid Reasoning Index	88	Below Average	21%
Working Memory Index	78	Borderline	7%
Processing Speed Index	92	Average	30%
FULL SCALE SCORE	87	Below Average	19%
WIAT IV Reading	80	Below Average	9%
WIAT IV Math	90	Average	25%
WIAT IV Writing	82	Below Average	12%

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FAR index	Standard score (95% CI)	Percentile	Qualitative descriptor
Phonological Index	75(+/-5)	5%	Moderately Below Average
Fluency Index	92 (+/-7)	30%	Average
Mixed Index	81 (+/-5)	10%	Below Average
Comprehension Index	92 (±8)	30%	Average
FAR Total Index	**81 (±5)**	**10%**	**Below Average**

KEY SUBTEST INTERPRETATION	Score	Percentile	Descriptor
Nonsense Word Decoding – requires the student to decode a series of nonsense words presented in order of increasing difficulty .	71	3%	Moderately Below Average
Irregular Word Reading Fluency – the student reads a list of phonologically irregular words arranged in order of increasing difficulty in 60 seconds.	95	37%	Average

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READING PROGRAMS	FAR INTERPRETIVE REPORT WRITER: Targeted Reading Programs
Alphabetic Phonics	A multisensory phonological approach to reading that is an extension of the traditional Orton-Gillingham model. There are 11 fast-paced activities embedded within each lesson to develop automaticity with phonics skills.
Read Well	A top-down reading and language arts solution that emphasizes a mixture of instruction to the class as a whole, smaller groups, and individual student practice.
Lexia Primary Reading	A self-paced computer-based program that helps students develop reading skills. The program identifies when students would benefit from additional support, and automatically notifies the teacher with individualized feedback and recommendations.
Fast Forword Language to Reading	A scientifically-based 8-12 week reading intervention that boosts students' reading levels by one or two grades. Focuses on phonemic awareness, phonics, fluency, comprehension, and vocabulary.
Voyager Time Warp Plus	A summer reading intervention that encompasses 80 hours-worth of material. Phonemic awareness, phonics and word analysis, fluency, vocabulary, and comprehension are covered thoroughly through daily practice.
System 44	Teaches foundational reading skills to students Grades 3+. This computer-based platform encourages students to think critically and interact with the text as they learn phonics and comprehension.
Academy of Reading	An intervention program that helps students with phonemic awareness, phonics, fluency, vocabulary, and comprehension. This online program Includes real-time reading assessments and progress monitoring.
Words Their Way	A developmental spelling, phonics, and vocabulary program with numerous activities geared toward developing orthographic knowledge. Sorting, constructing a word wall, and creating a word study notebook are essential components of the program.

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FAR Interpretive Report Writer: Strategies

1. **Phonemic Progressions—**Develop sensitivity to sounds (phonemic awareness) by practicing rhyming skills and sensitivity to sounds, and then having children learn to group similar words by sounds. Next, learn to break apart and put words together by sound and syllable boundaries. Finally, the manipulation and/or deletion of sounds (say "smack" without the "m") is the final stage of phonemic development.

2. **Sound Positioning**—Practice determining the position of sounds in words in order to foster more accurate reading and spelling skills. For instance, show him a picture of a birthday cake with the letters **C –___ -KE** spelled underneath. When he can consistently identify and write the missing letter, change the positioning of the missing sound. He should begin by isolating initial sound positions, then ending sound positions, and finally medial vowel blends and vowel dipthongs.

3. **Tile Spelling**—Practice spelling words with grapheme tiles. Color coding vowel digraphs (back-to-back vowels making one sound) such as ch**ai**r or c**au**tion may be particularly helpful.

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4. **Sight Spelling**— Have Maxwell practice spelling arrangements of sounds by tasks such as identifying which of three sight words is spelled correctly *(e.g., "wuz", "whas", or "was")* to develop automaticity recognizing vowel patterns in words.

5. **Six Syllable Subtypes**—Explicit instruction on the 6 syllable subtype pattern in the English language, since 90% of words will adhere to this spelling pattern. These include:
a) Closed syllables—just one vowel, such as "c**a**t"
b) Open syllables—ends in long vowel, such as "bab**y**"
c) Vowel-Consonant E Syllables—silent 'e' elongates vowel, such as "mak**e**"
d) Vowel-Team Syllables—two vowels make one sound, such as "c**au**tion"
e) R-Controlled Syllables—vowel followed by 'r' changes sound, such as "hu**r**t"
f) Consonant-le Syllables—end of word ending in 'le', such as "turt**le**"

6. **Sound Cards**—Construct sound cards to develop automaticity with previously learned phonemic patterns, as well as to introduce new blends as well.

7. **Finger Tapping**—Use finger tapping to learn sound and syllable breaks in words, as well as to facilitate spelling rules and boundaries.

8. **Decodable Text**—Incorporate reading **decodable text** in every lesson so students develop a better feel for applying phonological processing skills to words in context and not just in isolation.

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The FAR Advantage

- Based upon a model of brain functioning.
- Use in conjunction with an academic achievement test
- Explains **WHY** a student is having reading difficulty, not just **WHERE** the student is reading.
- Directly informs intervention decision making.
- Can diagnose, screen, or use for progress monitoring
- Ecologically valid because neurocognitive processes are built into the test.
- Puts the **"I"** back in **IEP's**!!!

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Written Language Presentation Outline

- **Defining Dysgraphia**
- **Cognitive Constructs and Writing**
- ***3* Subtypes of Written Language Disorders**
- **Strategies for Success**
- **Introducing the FAW**
- **Case Examples**

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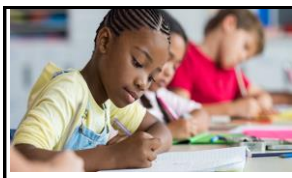

What is Dysgraphia?

Dysgraphia is a broad-based term that refers to a specific learning disability in written expression. The term can include problems with letter formation, legibility, letter spacing, spelling, fine motor coordination, rate of writing, grammar and overall sentence production (Chung et al., 2020).

Developmental Dysgraphia refers to difficulty acquiring writing skills despite adequate learning opportunities and cognitive skills.

- Younger children tend to have deficits with the motoric aspects of the written stroke, whereas older children struggle with more cognitive-linguistic elements of writing (Biotteau et al., 2019).

Acquired Dysgraphia refers to a learned skill (writing) being disrupted by a specific injury or degenerative condition.

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Types of Writing Genres

- **Persuasive** - change the reader's point of view in order to affect the reader's action.
- **Expository**- explaining objective information to enhance the reader's overall understanding.
- **Experiential** - to describe a personal experience or narrative to others.
- **Prosaic** – to convey a particular sentiment or emotion from a personal experience. Often written in a metaphoric style inclusive of poem, lyric, or sonnet.
- **Analytical** – heavily structured style of writing where scientific scrutiny involved.

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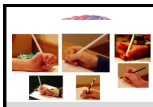

Warning Signs of Developmental Dysgraphia

Age Group	Signs of Dysgraphia
Preschool aged children	• Awkward pencil grasp • Lack of hand dominance • Fatigues quickly when writing • Letters poorly formed or inversed • Difficulty writing within margins • Overflow motor movements • Does not anchor paper with opposite hand.
Elementary aged students	• Illegible or messy handwriting • Letter transpositions • Mirror writing • Switching between cursive and print • Slower paced writing • Poor spelling impacts legibility. • Frequent erasures
Secondary school students	• Poor planning and organizational skills. • Discrepancy between verbal output and • written output. • Difficulty keeping pace when note-taking. • Does not separate ideas by paragraph. • Paragraphs do not flow from general to • specific. • Grammar impacts legibility.

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Cole: 3rd grade…Attention/Writing issues

WISC V Composites	COMPOSITE SCORE	CONFIDENCE INTERVAL	RANGE	PERCENTILE RANK
Verbal Comprehension Index	85	78– 92	Low Average	16%
Perceptual Reasoning Index	100	92 – 108	Average	50%
Fluid Reasoning Index	90	83 - 97	Average	25%
Working Memory Index	77	71 – 86	Very Low	6%
Processing Speed Index	78	72 – 90	Very Low	7%
Full Scale Score	83	79 – 88	Low Average	13%

WIAT-IV WRITING SUBTESTS	SCORE	PERCENTILE	RANGE
Spelling - the student writes words dictated by the examiner from a word list.	86	18%	Below Average
Sentence Composition– this subtest has two separate parts. First, the student combines two or more sentences into a single sentence that maintains meaning, and also uses correct punctuation and grammar skills *(Sentence Combining)*. In the second part, the student constructs a sentence from a stimulus word provided *(Sentence Building)*.	80	9%	Below Average
Essay Composition - the student has ten minutes to construct an essay about a favorite game or activity, and must list specific reasons for liking the game or activity.	95	37%	Average
WRITTEN EXPRESSION SCORE	85	16%	Below Average

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Questions….Questions….No Answers!

1. Why does Cole have difficulty with writing?
2. Which writing disorder subtype, if any, does Cole possess?
3. What are your primary recommendations for Cole?
4. Does Cole qualify for special education services**?**

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Presentation Outline

Defining Dysgraphia

➡ **Cognitive Constructs and Writing**

***3* Subtypes of Written Language Disorders**

Strategies for Success

Introducing the FAW

Case Examples

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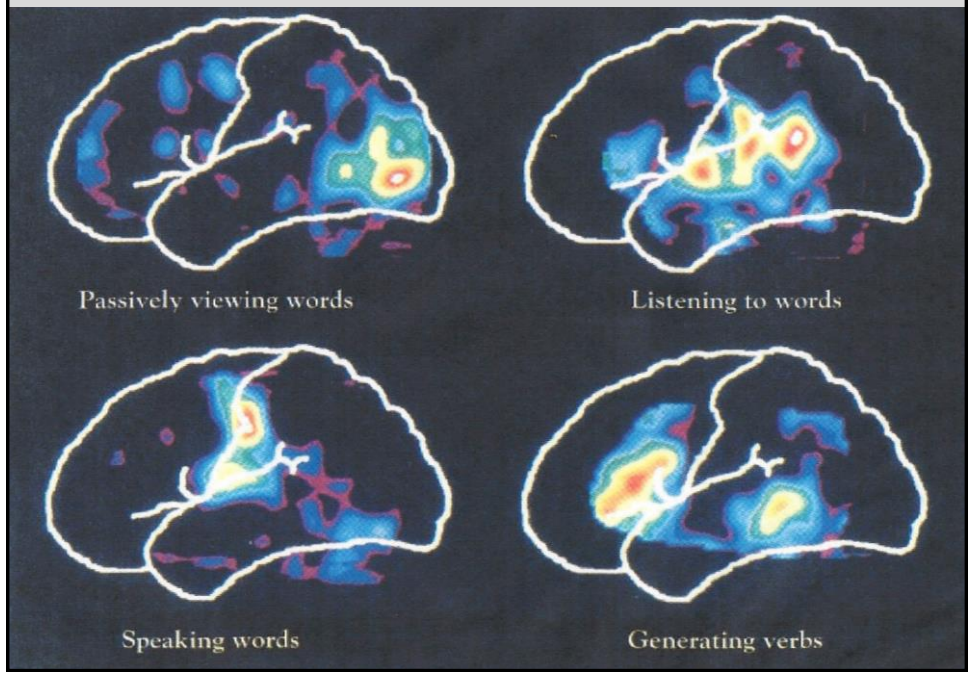
THE WRITING BRAIN (Posner & Raichle, 1994)



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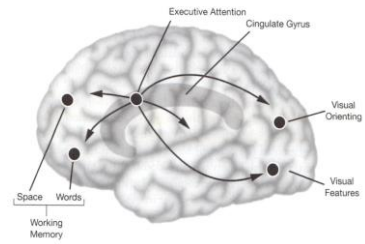
Cognitive Constructs and Written Language

Attention: (Selective & Sustained)

- Poor planning
- Uneven tempo
- Erratic legibility
- Inconsistent spelling
- Poor self monitoring
- Impersistence



BRAIN REGION **- Anterior Cingulate Gyrus**
****Effort control and top-down attention***

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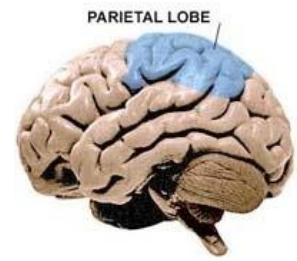
Cognitive Constructs and Written Language

Spatial Production

- Poor spatial production
- Poor visualization
- Poor margination
- Organization problems
- Uneven spacing
- Poor use of lines



BRAIN REGION –Right Parietal Lobe

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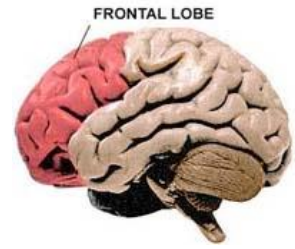
Cognitive Constructs and Written Language

Sequential Production



- Poor connected writing
- Letter reversals
- Organizational deficits
- Lack of cohesive ties
- Deficits in working memory, especially with ADHD kids, leads to sequential dysfunction.

BRAIN REGION – Left Prefrontal Cortex

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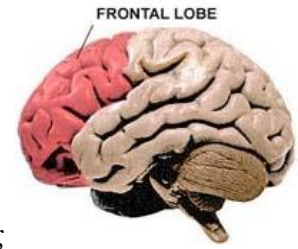
Cognitive Constructs and Written Language

Working Memory Skills



- Poor *word retrieval* skills
- Poor spelling
- Poor grammar rules
- Loss of train of thought
- Deterioration of continuous writing
- Poor elaboration of ideas
- Cortical mapping of language is *distributed* throughout brain *(i.e. nouns vs. verbs)*

BRAIN REGION – Semantic memories stored in temporal lobes. Retrieved by frontal lobes

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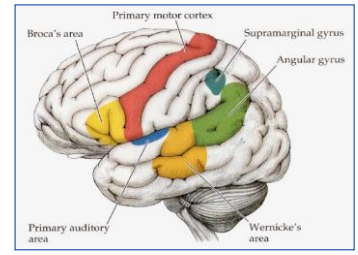
Cognitive Constructs and Written Language



Language:

- Poor vocabulary
- Lack of cohesive ties
- Poor grammar
- Simplistic sentence structure
- Left hemisphere stores language by converging words into semantic baskets; right hemisphere excels in more divergent linguistic skills (simile and metaphor).
- Writing genre impacts retrieval!

BRAIN REGION – Temporal Lobes

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Divergent Retrieval and Writing

- *"Subdivisions"* (1982) written by Neil Peart and was used to express the loneliness of growing up in a bland suburb and being forced to conform to an unwanted norm:

"Growing up it all seems so one-sided
Opinions all provided
The future pre-decided
Detached and subdivided
In the mass production zone
Nowhere is the dreamer or the misfit so alone"

- Ries and colleagues (2016) noted right frontal activity has been shown to increase when word selection difficulty is increased or more abstract, and greater cognitive flexibility is required.

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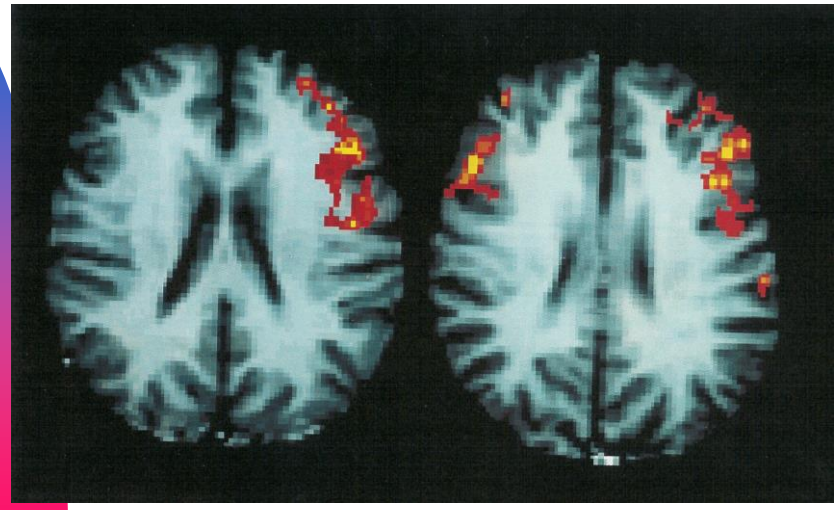
Gender Differences in Phonological Processing



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Gender Differences: What the research says….

Krafnick, A.J. & Evans, T. M. (2019). Neurobiological Sex Differences in Developmental Dyslexia. Frontiers in Psychology, Vol.9,1-14.

- A **language-based learning disability** impacts 5-13% of the population due to poor decoding & spelling skills.
- **Language-based learning disabilities** have higher ratios for boys than girls.
- Lower levels of **testosterone** *(measured in utero)* correlate with less gray matter in language (temporal-parietal) regions for males.
- **Conclusion:** Deficits with **testosterone** impacts reading brain for males. Deficits with **estrogen** does not necessarily impact reading brain for females, but has been linked to deficits in sensorimotor areas.

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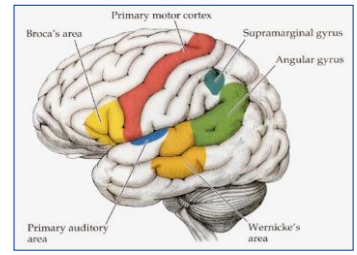
Cognitive Constructs and Written Language

Intelligence

- Concrete ideation
- Poor development of ideas
- Poor audience awareness
- Weak opinion development
- Simplistic sentence structure



BRAIN REGION – Inferior Parietal Lobes

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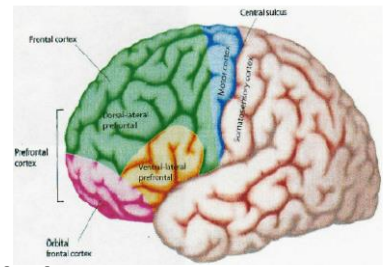
Cognitive Constructs and Written Language

Executive Functioning

- Organize and plan ideas
- Self monitor
- Task initiation
- Sustain attention to task
- Difficulty making cognitive shifts from one topical area to another.



BRAIN REGION – Dorsolateral Prefrontal Cortex

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Cognitive Constructs and Written Language: Motor Output Speed (Pollock et al, 2009)

Grade Levels	Handwriting Speed
Grade 1	15 - 32 letters per minute
Grade 2	20 - 35 letters per minute
Grade 3	25 - 47 letters per minute
Grade 4	34 - 70 letters per minute
Grade 5	38 - 83 letters per minute
Grade 6	46 - 91 letters per minute

BRAIN REGION – Basal Ganglia

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Presentation Outline

Defining Dysgraphia

Cognitive Constructs and Writing

➡ **3 Subtypes of Written Language Disorders**

Strategies for Success

Introducing the FAW

Case Examples

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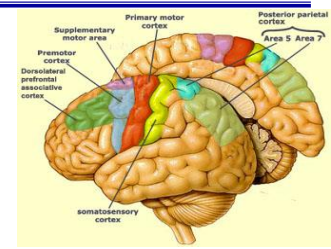
3 Subtypes of Written Language Disorders



(1) Graphomotor Dysgraphia - apraxia refers to a wide variety of motor skill deficits in which the voluntary execution of a skilled motor movement is impaired.

a) **Premotor cortex** - plans the execution of a motor response.

b) **Supplementary motor area** – guides motor movement.

c) **Cerebellum** - physical act of sequencing fine motor movements becomes less effortful and more reflexive.

d) **Basal Ganglia** – procedural memory and automaticity of handwriting and gross motor movements.

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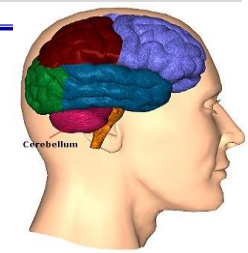
The Role of the Cerebellum in Writing



- The cerebellum contains **50%** of the neurons in the brain.
- Guides and corrects motor movements based upon proprioceptive feedback.
- Made up of **purkinje** cells and **granule** cells which are primarily excitatory, and help fine tune the writing process.
- Over time, the physical act of sequencing subtle motor movements becomes less effortful and more reflexive.
- Deficits mainly lead to motor coordination issues….ataxia….*("3971" ATM Code spatial/sequential)*

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Key Observations

1. Does the student have enough space on their desk?
2. Are both feet on the floor?
3. Does the student complain their hand is tired?
4. Does the student use excessive force?
5. Does the student use an immature grip?
6. Does the student constantly rub their eyes when writing or put their head down on the desk?
7. Does the student appear distracted?
8. Does the student use their opposite hand to anchor**?**

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3 Subtypes of Written Language Disorders

(2) Dyslexic Dysgraphias: (Spelling Miscues)

a) Dysphonetic dysgraphia – the hallmark feature of this disorder is an inability to spell by *sound* due to poor *phonological* skills. There is often an over-reliance on the visual features of words when spelling*(i.e "sommr" for "summer")*.

b) Surface dysgraphia – a breakdown in the *orthographic* representation of words. Miscues made primarily on phonologically irregular words *(i.e. "laf" for "laugh"; "juse" for "juice"; "mite" for "mighty").*

c) Mixed Dysgraphia – characterized by a combination of both *phonological* errors and *orthographical* errors depicting faulty arrangement of letters and words *(i.e "ceshinte" for "kitchen")*.

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Key Spelling Strategies

1. Incorporate nonsense words into weekly spelling instruction to make sure students can represent each sound with a letter.
2. Use tile spelling markers to color-code vowel digraphs in words by families *(i.e. Sauce, Pause, cause, etc…)*
3. Place a heavy focus on prefixes and suffixes during instruction.
4. Have students write each word with white space in between each syllable in the word using the box approach. *(i.e. fascinate)*

f a s c i n a t e

5. Show multiple spellings of a word and have the student select the correct choice *(i.e wuz, was, whas).*

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3 Subtypes of Written Language Disorders

(3) Executive Dysgraphia - an inability to master the implicit rules for grammar which dictate how words and phrases can be combined. Deficits in *working memory* and *executive* functioning in frontal lobes hinders output.

- Word omissions
- Word ordering errors
- Incorrect verb usage
- Word ending errors
- Poor punctuation
- Lack of capitalization
- Oral vs. written language discrepancy

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Features of Executive Dysgraphia

a) **Verbal Retrieval Skills** – the frontal lobes are critical in retrieving words stored throughout the cortex, often stored by semantic categories.

b) **Working Memory Skills** – helps to recall spelling rules and boundaries, grammar rules, punctuation, and maintaining information in mind long enough for motoric output.

c) **Organization & Planning** – syntactical arrangement of thought needed to sequence mental representations.

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Executive Functioning and Written Language

Classification	Writing Dysfunction
(1) Initiating	* Poor idea generation * Poor independence
(2) Sustaining	* Lose track of thoughts * Difficulty finishing * Sentences disjointed
(3) Inhibiting	* Impulsive/Distractible
(4) Shifting	* Perseverations * "Stuck" on topic

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Executive Functioning and Written Language

Classification	Writing Dysfunction
(5) Poor Organization	* Frequent erasers * Forget main idea * Disjointed content
(6) Poor Planning	* Poor flow of ideas * Lack of cohesive ties
(7) Poor Word Retrieval	*Limited word choice * Simplistic sentences
(8) Poor Self Monitor	* Careless miscues * Sloppy work

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10 Research Based Strategies (Graham & Perin, 2007)

(1) Writing Strategies *(effect size .82)*
(2) Summarization *(effect size .82)*
(3) Collaborative Writing *(effect size .75)*
(4) Specific Product Goals *(effect size .70)*
(5) Word Processing *(effect size .55)*
(6) Sentence Combining *(effect size .50)*
(7) Prewriting *(effect size .32)*
(8) Inquiry activities *(effect size .32)*
(9) Process Writing Approach *(effect size .32)*
(10) Study of Models *(effect size .25)*

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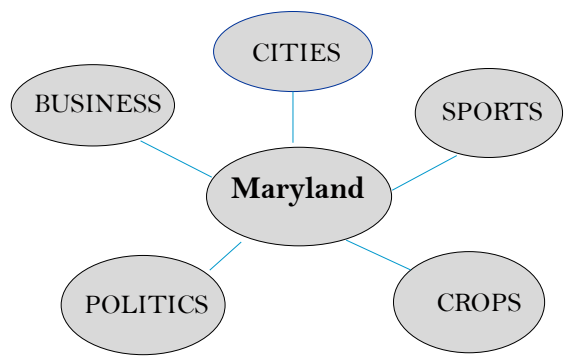
Graphic Organizers

Graphic Organizers – this involves a pre-writing activity whereby the student simply lists a word or phrase pertaining to the topic. An example may include a brainstorming a web:



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Self Monitoring Strategies

COPS *strategy* – a directional proof-reading strategy where the student re-reads a passage four times prior to completion.

1) **C**apitalize the first word of each sentence.

2) **O**rganize the information by reviewing topic sentences and double check paragraph breaks.

3) **P**unctuation miscues must be reviewed.

4) **S**pelling miscues must be reviewed.

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Self Monitoring Writing Rubric

IDEAS

4 The topic and details are well developed.
3 The topic is clear but more details are needed.
2 Details that don't fit the topic confuse the reader.
1 The topic is not clear.

ORGANIZATION

4 The beginning, middle, and ending work well.
3 Some parts of the essay are unclear.
2 All parts of the essay run together.
1 The order of information is confusing.

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Self Monitoring Writing Rubric

WORD CHOICE

4 Words make the meaning clear.
3 Clearer words are needed.
2 Some words are overused.
1 Words are used incorrectly.

CONVENTIONS

4 Conventions are used well.
3 There are few errors.
2 Errors make the essay hard to understand.
1 Help is needed to make corrections

AUDIENCE AWARENESS

4 The passage is clear and understandable for the intended audience.
3 The reader may need background knowledge to fully comprehend.
2 There are some parts of the passage that are difficult to understand.
1 The passage is extremely confusing for the intended audience.

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Strategies for Secondary Students

- **Inspirations** – teaches how to craft concept maps, idea maps, and other visual webbing techniques to assist in planning, organizing, and outlining. Very effective word predictive software.
- **Kurzweil Technology** - adaptive technology to further practice grammar, spelling, and punctuation. Voice activated software also an option.
- **Journal or Diary** – can be a fun and effortless way to practice writing on a daily basis.
- **Keyboarding** - speed up output to reduce pressure from working memory skills to retain information over longer periods of time.
- **Livescribe** - a *"smart"* pen which would both record lecture information in the class, as well as transcribe notes to a computer screen. Smart pens allow students to better organize their notes.

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5 Steps for Executive Dysgraphia (Ray, 2001)

(1) **Prewriting** - use graphic organizers.

(2) **Drafting** – use model to take notes and model how to organize in a text form using topic sentences.

(3) **Revising** – second draft emphasizing content, and elaboration of ideas and making connections.

(4) **Editing** – re-read for capitalization and punctuation errors.

(5) **Publishing** – peer assisted strategies and teaching students to give and receive feedback base upon a writing rubric.

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Handwriting Supplemental Progrms

Name	Supplemental Program
1. Handwriting Without Tears	Developmentally appropriate and multisensory approach using innovative letter order and style.
2. Zaner-Bloser	Apps, writing games, and other reading and writing resources.
3. Big Strokes for Little Folks	Geared for students who can recognize letters but struggle to write them.
4. Sensible Pencil	Applicable to both home and school in teaching letter writing skills.
5. Loops and Other Groups	A kinesthetic approach to teach writing in cursive.

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EmPOWER & SRSD

EmPOWER – developed by Dr. Bonnie Singer *through Architects for Learning*. Can use in any class in any grade. Six steps include:
Evaluate –break down the task to determine what I have to do.
Plan – identify my purpose for writing and select strategies.
Organize – show my thinking and organize my ideas.
Work – work my ideas into a well structured text.
Evaluate – assess my work.
Re-Work – make necessary changes.

SRSD – Self-**R**egulated **S**trategy **D**evelopment. Research based to improve planning, editing and written product (De la Paz, 2007; De la Paz & Graham, 2002; Englert, 2009; Graham, 2006; Graham & Perin, 2007; Perin, 2007).

- 5 steps include: Discuss It, Model It, Make It Your Own, Support It, Independent Performance.

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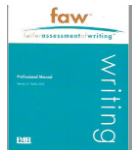

Feifer Assessment of Writing (FAW)

- A neurodevelopmental assessment of written language disorders.
- Pre-K to College (Ages 4-21)
- 12 subtests in complete battery/10 subtests core
- Diagnoses 3 subtypes of writing disorders:
  - **1) Graphomotor Dysgraphia**
  - **2) Dyslexic-Dysgraphia**
  - **3) Executive Dysgraphia**
- Includes the FAW-S dysgraphia screening battery
- Yields a Compositional Writing Index (CWI)

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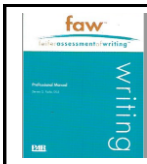

Feifer Assessment of Writing (FAW)

Structure of the FAW

Index	Subtest	Grade range	Approximate administration time in minutes
Graphomotor Index (GI)	Alphabet Tracing Fluency (ATF)	PK to college	1 - 2
	Motor Sequencing (MS)	PK to college	3 - 4
	Copying Speed (CS)	K to college	3 - 4
	Motor Planning (MP)	PK to college	2 - 3
Dyslexic Index (DI)	Homophone Spelling (HS)	K to college	3 - 4
	Isolated Spelling (IS)	PK to college	4 - 6
Executive Index (EI)	Executive Working Memory (EWM)	Grade 2 to college	10 - 12
	Sentence Scaffolding (SS)	Grade 2 to college	13 - 16
	Retrieval Fluency (RF)	PK to college	7 - 8
	Expository Writing (EW)	Grade 2 to college	6
Compositional Writing Index (CWI) ***(optional)***	Expository Writing (EW)	Grade 2 to college	6
	Copy Editing (CE) ***(optional)***	Grade 2 to college	4
	Story Mapping (SM) ***(optional)***	Grade 2 to college	6

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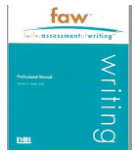

Feifer Assessment of Writing (FAW)

5 Step Analysis of FAW

1. Determine **FAW Total Index Score**
2. Compare **FAW Index Scores** and examine both:
   a) **Absolute** Strengths and Weaknesses
   b) **Relative** Strengths and Weaknesses
3. Targeted **Subtest Interpretation**/Comparison
4. **Behavioral Observations**

*5. Optional **Skills** Analysis

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➡ **Case Examples**

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Cole: 3rd grade…Attention/Writing issues

WISC V Composites	COMPOSITE SCORE	CONFIDENCE INTERVAL	RANGE	PERCENTILE RANK
Verbal Comprehension Index	85	78– 92	Low Average	16%
Perceptual Reasoning Index	100	92 – 108	Average	50%
Fluid Reasoning Index	90	83 - 97	Average	25%
Working Memory Index	77	71 – 86	Very Low	6%
Processing Speed Index	78	72 – 90	Very Low	7%
Full Scale Score	83	79 – 88	Low Average	13%

WIAT-IV WRITING SUBTESTS	SCORE	PERCENTILE	RANGE
Spelling - the student writes words dictated by the examiner from a word list.	86	18%	Below Average
Sentence Composition– this subtest has two separate parts. First, the student combines two or more sentences into a single sentence that maintains meaning, and also uses correct punctuation and grammar skills *(Sentence Combining)*. In the second part, the student constructs a sentence from a stimulus word provided *(Sentence Building)*.	80	9%	Below Average
Essay Composition - the student has ten minutes to construct an essay about a favorite game or activity, and must list specific reasons for liking the game or activity.	95	37%	Average
WRITTEN EXPRESSION SCORE	85	16%	Below Average

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Cole: 3rd grade…Attention/Writing issues

Score Summary

Page range	Subtest	Raw score	Standard score	Index standard score	Confidence interval ☐ 90% ☑ 95%	Percentile
7	Alphabet Tracing Fluency (ATF)	21	105			63
8-9	Motor Sequencing (MS)	20	+ 95			37
19	Copying Speed (CS) K+	17	+ 95			37
20-21	Motor Planning (MP)	7	+ 75			5
	Graphomotor Index (GI)		= 370	90	80-100	25
5-6	Homophone Spelling (HS) K+	31	86			18
22-24	Isolated Spelling (IS)	53	+ 104			61
	Dyslexic Index (DI)		= 190	94	87-101	34
10-12	Executive Working Memory (EWM) 2nd+	2	64			1
13-14	Sentence Scaffolding (SS) 2nd+	9	+ 86			18
15-18	Retrieval Fluency (RF)	28	+ 102			55
25	Expository Writing (EW) 2nd+	6	+ 78			7
	Executive Index (EI)		= 330	76	67-85	5
	GI + DI + EI = FAW Total Index (TI)		890	83	76-90	13
Supplemental Index						
25	Expository Writing (EW) 2nd+	6	78			7
26-27	(Copy Editing [CE] 2nd+) optional	(32)	+ (106)			66
28-29	(Story Mapping [SM] 2nd+) optional	(7)	+ (74)			4
	Compositional Writing Index (CWI)		= 257	82	72-92	12

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Cole: 3rd grade…Attention/Writing issues

Key Analysis #1: Cole's copying speed is significantly better than Motor Planning suggesting impulsive response style.

Key Analysis #2: Cole's Isolated Spelling higher than Homophone Spelling. He responded to multiple choice items impulsively. His overall spelling is fine.

Key Analysis #3: Cole has significant working memory issues hindering his ability on independent writing tasks.

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Cole: 3rd grade…Attention/Writing issues

- **Graphic Organizers:** a pre-writing activity where Cole lists words and phrases pertaining to a topic that has been organized.
- **Noun-Verb Linkage** – present younger students with a list of common nouns *(i.e. cup, paper, pencil, door, phone, book, etc.)* and have them link or attach a verb to each noun to increase vocabulary development and flow of ideas.
- **Writing Prompts** – have students fill in basic writing prompts. For instance:
  1. Before bed each evening, I like to _____.
  2. My favorite food for breakfast is _____.
  3. The best part about my school is _____ .
- **EmPOWER:** an executive dysgraphia intervention developed by Dr. Bonnie Singer. Students talk themselves through 6 key steps of the writing process **(Evaluate, Make a Plan, Organize, Work, Evaluate, Re-work).**
- **Raised Lined Paper** – have students learn to anchor their writing within a defined space by using raised line paper. The raised line provides kinesthetic feedback to students who can then "feel" if their writing is correct.

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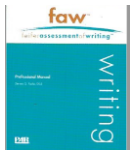

Feifer Assessment of Writing (FAW)

- A **diagnostic achievement test** in written language based upon a neurodevelopmental model of brain functioning.
- Explains **WHY** a student is having writing difficulty, by examining **3 subtypes** of written language disorders.
- Can diagnose, screen, or use for progress monitoring.
- Ecologically valid because neurocognitive processes are built into the test.
- Directly informs intervention decision making using the **PAR I-Connect** interpretive report writer.
- Puts the **"I"** back in **IEP's**!!!

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Let's Stay Connected

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