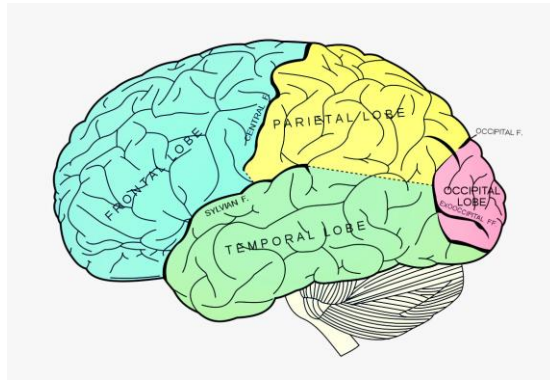


The Neuropsychology of Written Language Disorders: Developing Research Based Interventions

feiferassessmentofwriting™



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PAR

1

Dr. Feifer's Journey 1992 – present

www.schoolneuropsychpress.com

fact
feiferassessmentofchildhood
TRAUMA™ teacher form




- Nationally certified **school psychologist** 20+ years
- Certified in **school & pediatric** 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
- Faculty instructor in School Neuropsychology Training Program.

PAR

2

2




Presentation Outline

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- ➔ Defining Dysgraphia
 - Cognitive Constructs and Writing
 - 3 Subtypes of Written Language Disorders
 - Evidence vs Research Based Interventions
 - Strategies for Success
 - Introducing the FAW
 - Case Example

PAR 3

3




Five Quick Facts About Written Expression

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1. Most students rely on writing, either e-mail, text messages, word processing, or other computerized technology to communicate.
2. According to NAEP, 54% of 8th graders and 52% of 12th graders perform at a *Basic* level in written expression.
3. Males score *significantly* lower than females on standardized assessments of written language (NAEP, 2011).
4. Children spend nearly 60% of their school day actively engaged in the process of written expression or some equivalent fine motor-related endeavor (Feder & Majnemer, 2007).
5. Writing remains one of the most challenging skills to teach our students.

PAR 4

4




Types of Writing Genres

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- **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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5



What is Dysgraphia?

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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.

PAR 6


6



Warning Signs of Developmental Dysgraphia

Age Group	Signs of Dysgraphia
Preschool aged children	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

7



Cole: 3rd grade...Attention/Writing issues


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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 (<i>Sentence Combining</i>). In the second part, the student constructs a sentence from a stimulus word provided (<i>Sentence Building</i>).	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

PAR 8

8



Questions....Questions....No Answers!

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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?

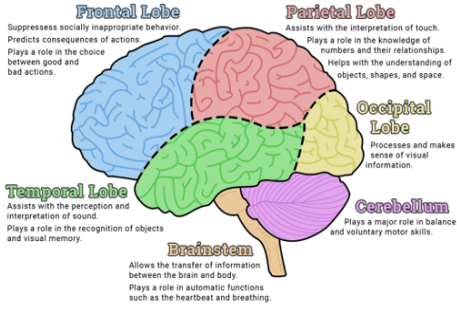
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9

A Neuropsychological Perspective

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The Human Brain



Frontal Lobe
Suppresses socially inappropriate behavior.
Predicts consequences of actions.
Plays a role in the choice between good and bad actions.

Parietal Lobe
Assists with the interpretation of touch.
Plays a role in the knowledge of numbers and their relationships.
Helps with the understanding of objects, shapes, and space.

Occipital Lobe
Processes and makes sense of visual information.

Temporal Lobe
Assists with the perception and interpretation of sound.
Plays a role in the recognition of objects and visual memory.


Cerebellum
Plays a major role in balance and voluntary motor skills.

Brainstem
Allows the transfer of information between the brain and body.
Plays a role in automatic functions such as the heartbeat and breathing.


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

PAR 10

10



Presentation Outline



Defining Dysgraphia

➔ **Cognitive Constructs and Writing**



3 Subtypes of Written Language Disorders

Evidence vs Research Based Interventions

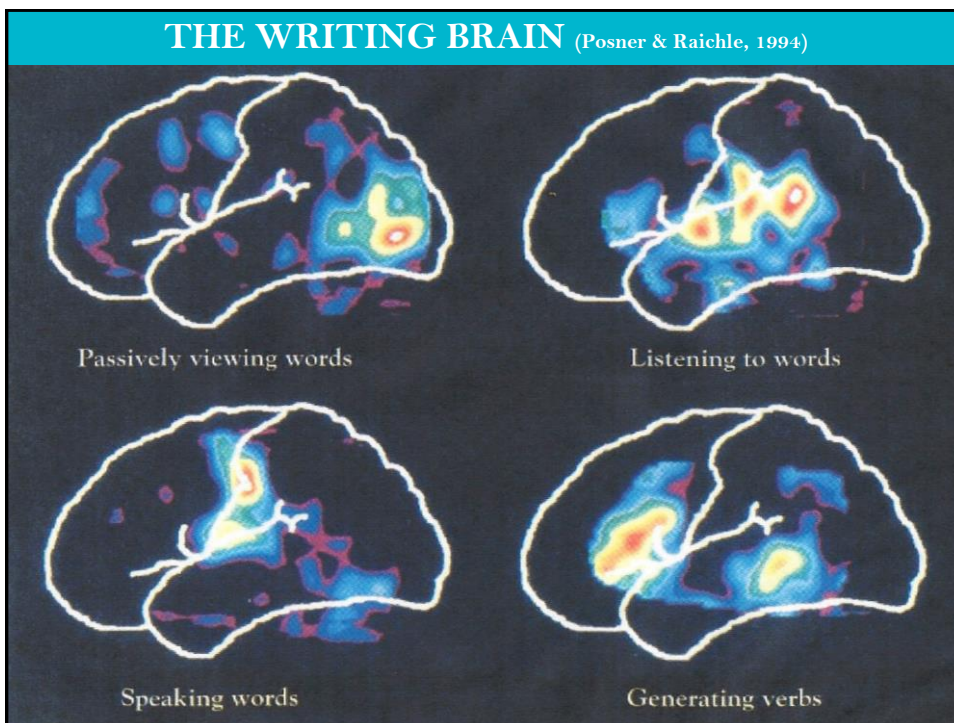
Strategies for Success

Introducing the FAW

Case Example

11



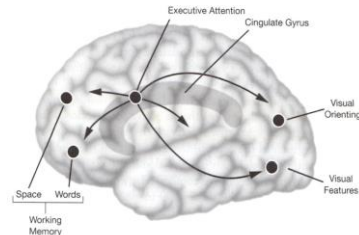
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Cognitive Constructs and Written Language

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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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13

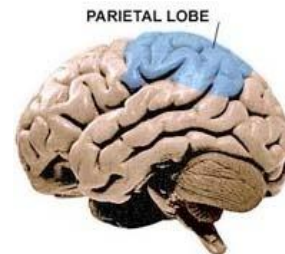
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Cognitive Constructs and Written Language

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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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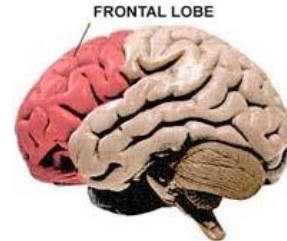
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Cognitive Constructs and Written Language

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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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15

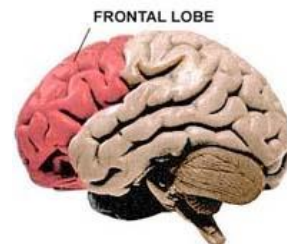
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Cognitive Constructs and Written Language

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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

PAR

16

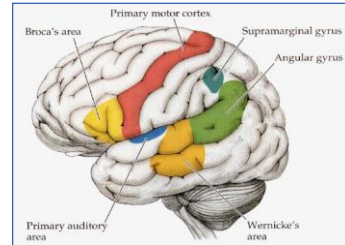
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Cognitive Constructs and Written Language

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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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17

17

Divergent Retrieval and Writing

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- “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.

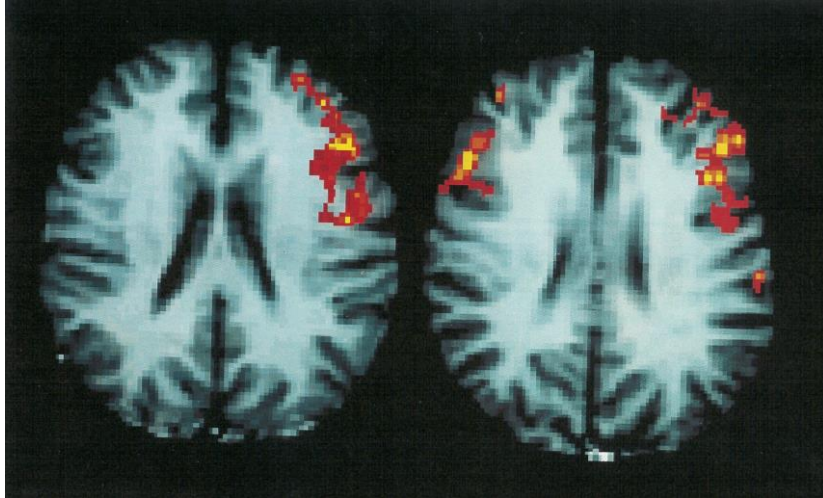
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18

18

Gender Differences in Phonological Processing

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19

19

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.

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- 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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20

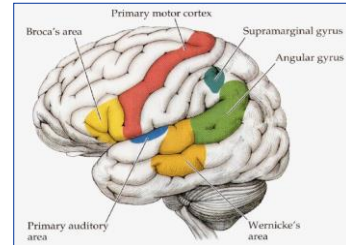
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Cognitive Constructs and Written Language

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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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21

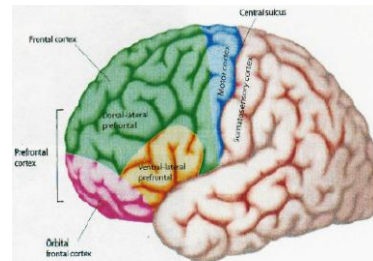
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Cognitive Constructs and Written Language

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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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22

22

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


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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

PAR 23

23



Presentation Outline

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- Defining Dysgraphia**
- Cognitive Constructs and Writing**
- 3 Subtypes of Written Language Disorders**
- Evidence vs Research Based Interventions**
- Strategies for Success**
- Introducing the FAW**
- Case Example**

PAR 24

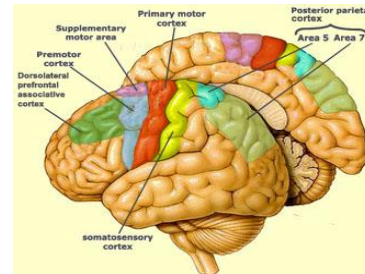
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3 Subtypes of Written Language Disorders:

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(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** - provides proprioceptive feedback.
- d) **Basal Ganglia** – procedural memory and automaticity of handwriting.



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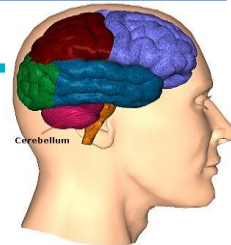
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25

The Role of the Cerebellum in Writing

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- 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)



PAR

26

26

KEY OBSERVATIONS

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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 the page?

PAR

27

27

3 Subtypes of Written Language Disorders

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(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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28

28

Key Spelling Strategies

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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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29

29

3 Subtypes of Written Language Disorders

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(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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30

30

Features of Executive Dysgraphia

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- 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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31

31

Verbal Retrieval and Writing

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Adjective Arrangement – the use of colorful adjectives to convey an emotive tone or particular sentiment is critical in more experiential and prosaic writing.

Positive Feeling Words	Negative Feeling Words	Context-Specific Words
<i>amazed</i>	<i>aggravated</i>	<i>anxious</i>
<i>attractive</i>	<i>awful</i>	<i>awestruck</i>
<i>bold</i>	<i>chilly</i>	<i>bashful</i>
<i>brave</i>	<i>dejected</i>	<i>cautious</i>
<i>bubbly</i>	<i>dirty</i>	<i>composed</i>
<i>cheerful</i>	<i>dreadful</i>	<i>easygoing</i>
<i>comfortable</i>	<i>heavy</i>	<i>horrified</i>
<i>delightful</i>	<i>irritated</i>	<i>intelligent</i>
<i>excited</i>	<i>pessimistic</i>	<i>numb</i>
<i>festive</i>	<i>tearful</i>	<i>puzzled</i>
<i>free</i>	<i>tense</i>	<i>quizzical</i>
<i>jolly</i>	<i>terrible</i>	<i>ravenous</i>

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32

32

Working Memory and Writing & Spelling

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- **Phonological Loop** - holds and manipulates acoustic information. Housed in *left temporal lobes* and plays a role in holding and manipulating words through verbal rehearsal, and hearing the temporal order of sounds when spelling.
- **Visual-Spatial Sketchpad** - holds visual, spatial, and kinesthetic information in temporary storage by way of mental imagery. Housed along inferior portions of *right parietal lobes* and plays a role in visualizing word forms when spelling.
- **Central Executive System** – coordinates working memory systems and allocates attention resources. Impacted by anxiety and emotional distress (Dowker et al., 2015).



PAR

33

33

Executive Functioning and Written Language

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Classification

(1) Initiating

(2) Sustaining

(3) Inhibiting

(4) Shifting

Writing Dysfunction

* Poor idea generation

* Poor independence

* Lose track of thoughts

* Difficulty finishing

* Sentences disjointed

* Impulsive/Distractible

* Perseverations

* “Stuck” on topic

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34

34

Executive Functioning and Written Language

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Classification

(5) Poor Organization

(6) Poor Planning

(7) Poor Word Retrieval

(8) Poor Self Monitor

Writing Dysfunction

- * Frequent erasers
- * Forget main idea
- * Disjointed content
- * Poor flow of ideas
- * Lack of cohesive ties
- * Limited word choice
- * Simplistic sentences
- * Careless miscues
- * Sloppy work

PAR

35

35

Presentation Outline

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Defining Dysgraphia

Cognitive Constructs and Writing

3 Subtypes of Written Language Disorders

➔ Evidence vs Research Based Interventions

Strategies for Success


Introducing the FAW

Case Example

PAR

36

36




Evidenced Based vs Research Based

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- **Evidence-Based Practices** refers to individual practices that are considered effective based on scientific evidence. To deem a program or practice “evidence-based,” researchers will typically study its impact in a controlled research setting, examining the validity, reliability and fairness of the program

- **Research Based or Evidenced Informed Practices** are practices which were developed based on the best research available in the field, which is often **anecdotal**. Unlike “Evidence-Based Practices”, these practices have not been researched in a controlled setting

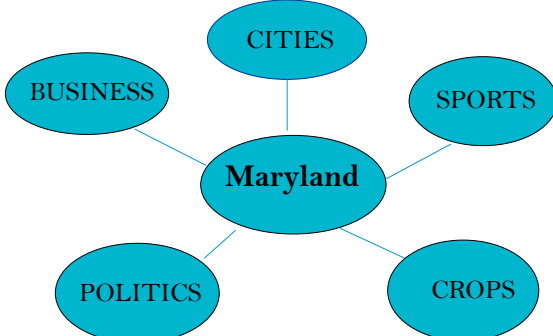

37

37

GRAPHIC ORGANIZERS


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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:



```

graph TD
    MD((Maryland)) --- B((BUSINESS))
    MD --- C((CITIES))
    MD --- S((SPORTS))
    MD --- P((POLITICS))
    MD --- CR((CROPS))
  
```


38

38

Self Monitoring Strategies

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



- 1) **Capitalize** the first word of each sentence.
- 2) **Organize** the information by reviewing topic sentences and double check paragraph breaks.
- 3) **Punctuation** miscues must be reviewed.
- 4) **Spelling** miscues must be reviewed.

PAR

39

39

Self Monitoring Writing Rubric

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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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40

40

Self Monitoring Writing Rubric

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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.

PAR

41

41

Strategies for Secondary Students

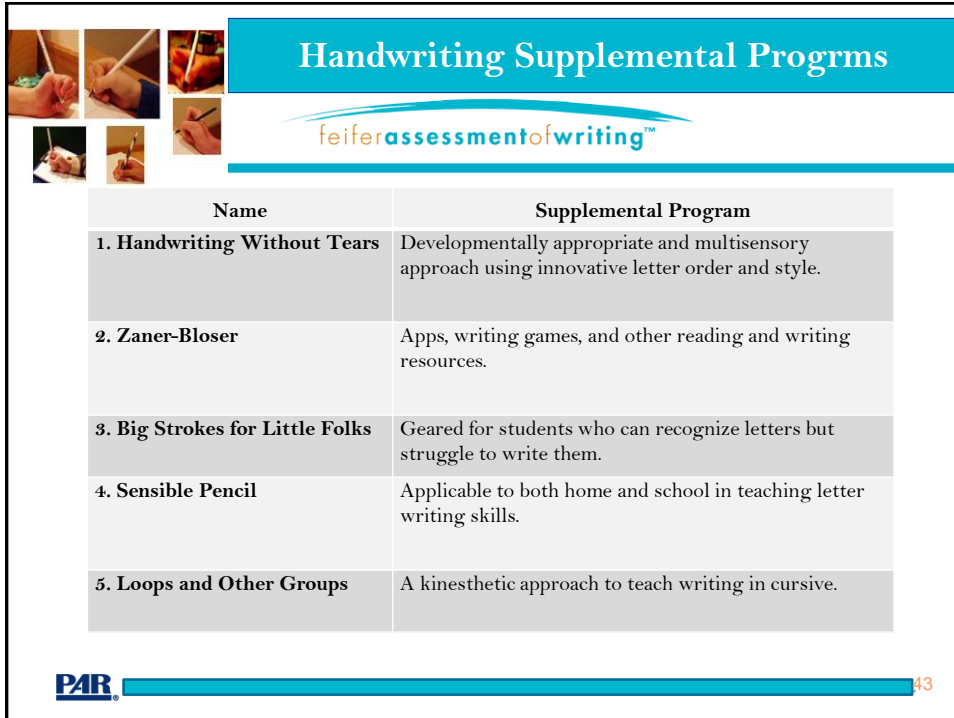
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- Inspirations – teaches how to craft concept maps, idea maps, and other visual webbing techniques to assist in planning, organizing, and outlining. Very effective word predictive software.
- Kurzweil Technology - adaptive technology to further practice 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.

PAR

42

42



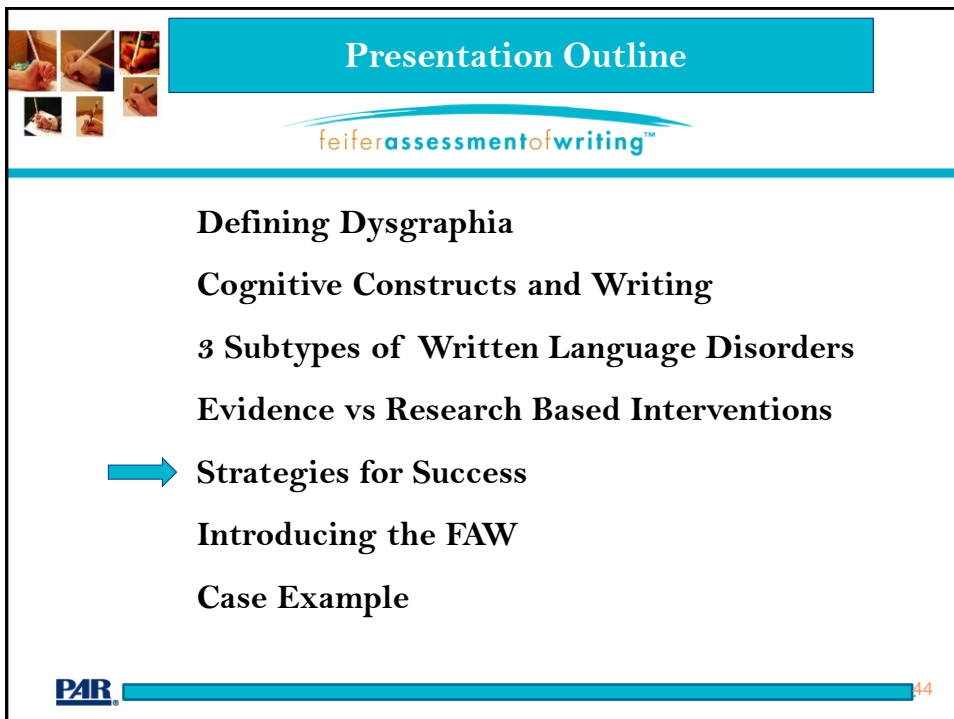
Handwriting Supplemental Programs

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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.

PAR 43

43



Presentation Outline

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- Defining Dysgraphia**
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- ➔ **Strategies for Success**
- Introducing the FAW**
- Case Example**

PAR 44

44

10 Research Based Strategies (Graham & Perin, 2007)

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- (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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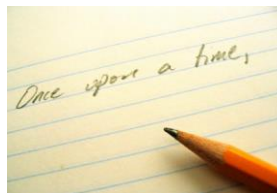
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5 Steps for Executive Dysgraphia (Ray, 2001)

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- (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.




PAR

46

46

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-Regulated Strategy Development. 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.



47



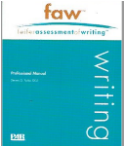

Presentation Outline





- Defining Dysgraphia**
- Cognitive Constructs and Writing**
- 3 Subtypes of Written Language Disorders**
- Evidence vs Research Based Interventions**
- Strategies for Success**
- ➡ Introducing the FAW**
- Case Example**

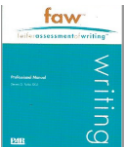

48

- 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)





49

49

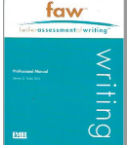



Structure of the FAW

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) <i>(optional)</i>	Expository Writing (EW)	Grade 2 to college	6
	Copy Editing (CE) <i>(optional)</i>	Grade 2 to college	4
	Story Mapping (SM) <i>(optional)</i>	Grade 2 to college	6



50

50



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Alphabet Tracing Fluency

30 seconds

Part B: Grades 2+

Response Form

Alphabet Tracing Fluency: Part B

brick	orange	knee
stripe	movie	watch
kite	ball	head
tiger	under	island
ear	lost	king
yellow	reject	spider
rabbit	knock	farm


Record Form

Part B: Grade 2+

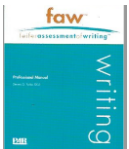
brick	/5	orange	/6	knee	/4	15
stripe	/6	movie	/5	watch	/5	31
kite	/4	ball	/4	head	/4	43
tiger	/5	under	/5	island	/6	59
ear	/3	lost	/4	king	/4	70
yellow	/6	reject	/6	spider	/6	88
rabbit	/6	knock	/5	farm	/4	103

Alphabet Tracing Fluency (ATF)
Grade 2+ total

/103	/30
Number correct	Time (seconds)



51



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Motor Sequencing

60 seconds

Part B: Grades 2+

Response Form

Motor Sequencing: Part B

Example

●	▲	★	■
mnw	zx	dbp	gu
■	●	▲	★


Record Form

Part B: Grade 2+

gu	mnw	zx	dbp	mnw	gu	zx	dbp	8
mnw	zx	dbp	zx	dbp	mnw	dbp	gu	16
mnw	dbp	gu	mnw	gu	dbp	mnw	zx	24
gu	gu	zx	dbp	gu	zx	gu	mnw	32
zx	dbp	mnw	gu	zx	mnw	dbp	zx	40
zx	dbp	mnw	gu	zx	mnw	dbp	zx	48
mnw	gu	dbp	zx	gu	dbp	zx	dbp	56
mnw	zx	gu	mnw	dbp	mnw	gu	zx	64


Motor Sequencing (MS)
Grade 2+ total

/64	/60
Number correct	Time (seconds)



52

52



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Copying Speed

Part B: Grades 2+

60 seconds

The earliest form of writing can be traced back to approximately 5,000 years ago. Written language initially began as cave drawings of things such as tools and animals. These drawings represented some form of spoken language. To the dismay of most students, painting pictures has been relegated to art class, and the study of written communication now includes grammatical rules, spelling patterns, and conjugations of verbs.

Response Form


Copying Speed: Part B

Record Form


Part B: Grade 2+

Passage	Word count	Punctuation count
The earliest form of writing can be traced back to approximately	11	0
5,000 years ago. Written language initially began as cave	20	2
drawings of things such as tools and animals. These drawings	30	3
represented some form of spoken language. To the dismay of	40	4
most students, painting pictures has been relegated to art	49	5
class, and the study of written communication now includes	58	6
grammatical rules, spelling patterns, and conjugations of verbs.	66	9
/60 Time (seconds)	/66 +	/9 = /75

Number of correctly spelled words	Number of correct punctuations	Number correct
-----------------------------------	--------------------------------	----------------


53

53



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Motor Planning

Part B: Grades 2+

60 seconds

Stimulus Book

1. Oceans are much bigger than lakes.
2. The view from the mountain top was stunning.
3. Writing my history essay was a daunting undertaking.
4. The dessert was simply magnificent. White chocolate with strawberries is nothing short of pure ecstasy.

Response Form

Motor Planning: Part B (continued)


1.
2.
3.
4.

Record Form

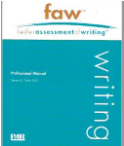
Part B: Grade 2+


Item
1. Oceans are much bigger than lakes.
2. The view from the mountain top was stunning.
3. Writing my history essay was a daunting undertaking.
4. The dessert was simply magnificent. White chocolate with strawberries is nothing short of pure ecstasy.
Time (seconds) /60

Category	Item 1 scores	Item 2 scores	Item 3 scores	Item 4 scores
Legibility	0 1 2	0 1 2	0 1 2	0 1 2
Placement	0 1 2	0 1 2	0 1 2	0 1 2
Spacing	0 1 2	0 1 2	0 1 2	0 1 2
Sizing	0 1 2	0 1 2	0 1 2	0 1 2
Completion	0 1	0 1	0 1	0 1
Item totals	/9 +	/9 +	/9 +	/9



54

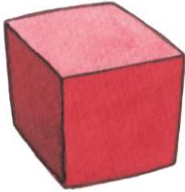




Homophone Spelling

Student must point to correct spelling of target word.


Stimulus Book



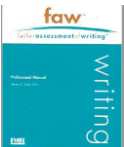
wred read red ret


Record Form

Item					Score		
K-2 nd	1.	wred	read	red	ret	0	1
	2.	know	no	now	noh	0	1
	3.	sen	sun	son	som	0	1
	4.	feet	feat	fete	feete	0	1
	5.	and	annt	aunt	ant	0	1
	6.	night	knight	nite	knite	0	1


55

55





Isolated Spelling

1st+ start points: Student must correctly write word that is dictated to them.


Response Form

Isolated Spelling (continued)

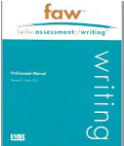
16. _____	34. _____
17. _____	35. _____
18. _____	36. _____
19. _____	37. _____
20. _____	38. _____
21. _____	39. _____
22. _____	40. _____
23. _____	41. _____
24. _____	42. _____
25. _____	43. _____

Record Form

		Item	Pronunciation	Score	
1 st	16.	hop	'hāp	0	1
	17.	mug	'mæg	0	1
	18.	pen	'pen	0	1
	19.	fix	'fiks	0	1
	20.	grow	grō	0	1
	21.	milk	'milk	0	1
	22.	job	'jāb	0	1
	23.	went	'went	0	1
	24.	cute	'kyüt	0	1
2 nd -4 th	25.	chomp	'chāmp	0	1


56

56



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Executive Working Memory


Response Form

Executive Working Memory (continued)

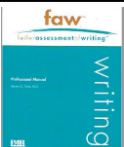
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Record Form

Item	Target words	Prompt	Prompt idea score	Target word score	Grammar/sentence structure score	Total score	Time
60 seconds per item							
1.	pizza, television, carpet, salad	Write one sentence about foods people eat.	0 1 2	0 1 2	0 1	/5	
2.	puppy, car, pencil, cat	Write one sentence about types of pets people have.	0 1 2	0 1 2	0 1	/5	
3.	hose, nails, hammer, water	Write one sentence that explains how to wash a car.	0 1 2	0 1 2	0 1	/5	
4.	ball, mittens, table, coat	Write one sentence that tells what some people wear when it is cold outside.	0 1 2	0 1 2	0 1	/5	
5.	chair, tag, kickball, bus	Write one sentence about different recess activities.	0 1 2	0 1 2	0 1	/5	
6.	breakfast, books, movie, airplane	Write one sentence that tells how some people prepare for school each morning.	0 1 2	0 1 2	0 1	/5	
Item totals			/12 +	/12 +	/6 =	/30	


57

57



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Sentence Scaffolding

Student must put in sequence a series of sentence cards presented to them in a random order.

1


My favorite swing is the blue one.

2

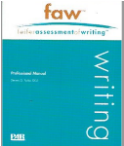
Tomorrow, I will try the red swing.


3

I like to play in the park.


58

58





Retrieval Fluency - Convergent Retrieval


Student is asked to verbally list four objects in a specific category.

PK-1st

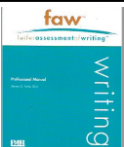
Item	Examinee responses	Score
1. Name four parts of the body.		0 1 2
2. Name four flavors of ice cream.		0 1 2
3. Name four things found at the beach.		0 1 2
4. Name four parts of a car.		0 1 2
5. Name four objects in outer space.		0 1 2
6. Name four things that are sticky.		0 1 2
7. Name four languages people speak.		0 1 2
8. Name four fruits that start with the letter P.		0 1 2
9. Name four types of transportation.		0 1 2
10. Name four types of reptiles.		0 1 2
<small>Convergent Retrieval PK-Grade 1 subtotal (second score on page 17)</small>		/20


2nd +

Item	Examinee responses	Score
1. Name four flavors of ice cream.		0 1 2
2. Name four types of transportation.		0 1 2
3. Name four objects in outer space.		0 1 2
4. Name four things someone can do on the internet.		0 1 2
5. Name four bodies of water.		0 1 2
6. Name four things that are sticky.		0 1 2
7. Name four colleges or universities.		0 1 2
8. Name four fruits that start with the letter P.		0 1 2
9. Name four units of measurement.		0 1 2
10. Name four parts of speech.		0 1 2
<small>Convergent Retrieval Grade 2+ subtotal (second score on page 18)</small>		/20


59

59





Retrieval Fluency - Divergent Retrieval


Student is asked to name another word in the same category that 3 presented words belong to.

PK-1st


Item	Correct answer	Examinee response	Score
1. monkey, giraffe, lion	any animal		0 1 2
2. grape, banana, apple	any fruit		0 1 2
3. knife, plate, napkin	anything used while eating		0 1 2
4. hat, coat, scarf	any warm clothing		0 1 2
5. refrigerator, microwave, stove	anything in a kitchen		0 1 2
6. trumpet, saxophone, flute	any instrument with a mouthpiece		0 1 2
7. lettuce, spinach, asparagus	any green vegetable		0 1 2
8. poodle, greyhound, beagle	any type of dog		0 1 2
9. river, stream, tributary	any flowing body of water		0 1 2
10. Iowa, Kansas, Illinois	any Midwest states		0 1 2

2nd +

Item	Correct answer	Examinee response	Score
1. poodle, greyhound, beagle	any type of dog		0 1 2
2. hat, coat, scarf	any warm clothing		0 1 2
3. cheddar, Swiss, cottage	any cheese		0 1 2
4. lettuce, spinach, asparagus	any green vegetable		0 1 2
5. trumpet, saxophone, flute	any instrument with a mouthpiece		0 1 2
6. trustworthiness, patience, generosity	any type of virtue		0 1 2
7. copper, zinc, boron	any element on the periodic table		0 1 2
8. Iowa, Kansas, Illinois	any Midwest states		0 1 2
9. wingtip, loafer, clogs	any type of shoe		0 1 2
10. rowboat, canoe, sailboat	any non-motorized boat		0 1 2


60

60



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Expository Writing

Student is given 5 minutes to write a paragraph about one of two prompts.

Record Form


Item	
5 ⁺	Write a paragraph persuading your teacher not to make the school day 1-hour longer.
6 ⁺	Write a paragraph describing how you would survive on a deserted island until rescued.

Category	Score
Organization	/4
Word Choice and Grammar	+ /4
Sentence Fluency	+ /4
Elaboration	+ /4
Prompt Incorporation	+ /4
Spelling	+ /3
Expository Writing (EW) total	= /23
Time (seconds)	/300



61

61



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Copy Editing (optional)

Student must correct spelling, capitalization, punctuation, and grammatical mistakes.


Response Form

Copy Editing (optional—continued)

Editing Key	
Capitalization mistake:	I like pio. = I like pio. or I like pio.
	I like Pio. = I like Pio.
Spelling mistake:	anser = answer or answer
Punctuation mistake:	What time is it. = What time is it?
Grammatical mistake:	I want to played. = I want to play.

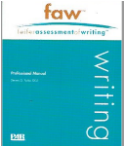
Record Form


	Item	Score	Unnecessary corrections
2 ⁺	1. I like ice cream.	/2	
	2. Most cats have soft fur.	/2	
	3. Do you have a red bicycle?	/1	



62

62





Story Mapping (optional)

Student is given 5 minutes to construct a story using provided story elements.

Stimulus Book

Characters: Ella, Timothy, Zoo Keeper


Setting: Zoo

Main Event: During a field trip to the zoo, the students noticed the monkey cage was left open.


Conclusion: The monkeys were safely returned to their cage.

Record Form


Category	Score
Organization	/4
Word Choice and Grammar	+ /4
Sentence Fluency	+ /4
Elaboration	+ /4
Story Elements	+ /4
Spelling	+ /3
Story Mapping (SM) total	= /23
Time (seconds)	/300


63


63




Presentation Outline



- Defining Dysgraphia**
- Cognitive Constructs and Writing**
- 3 Subtypes of Written Language Disorders**
- Evidence vs Research Based Interventions**
- Strategies for Success**
- Introducing the FAW**
- ➔ **Case Example**


64

64



Cole: 3rd grade...Attention/Writing issues


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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 (<i>Sentence Combining</i>). In the second part, the student constructs a sentence from a stimulus word provided (<i>Sentence Building</i>).	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





PAR 65

65




Cole: 3rd grade...Attention/Writing issues

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Score Summary						
Page range	Subtest	Raw score	Standard score	Index standard score	Confidence interval <input type="checkbox"/> 90% <input checked="" type="checkbox"/> 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) 2 nd +	2	64			1
13-14	Sentence Scaffolding (SS) 2 nd +	9	+ 86			18
15-18	Retrieval Fluency (RF)	28	+ 102			55
25	Expository Writing (EW) 2 nd +	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) 2 nd +	6	78			7
26-27	(Copy Editing (CE) 2 nd +) optional	(32)	(106)			66
28-29	(Story Mapping (SM) 2 nd +) optional	(7)	(74)			4
 Compositional Writing Index (CWI) =		257	82	72-92		12

PAR 66

66



Cole: 3rd grade...Attention/Writing issues

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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.

PAR 67

67




Cole: 3rd grade...Attention/Writing issues

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
- **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.


PAR 68

68




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- 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!!!**





69

69




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Tests: FAR- 2015 FAM- 2016 FAW - 2020



70

70