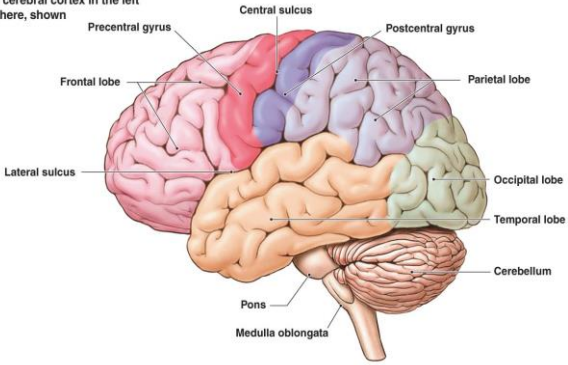


The Neuropsychology of Reading Disorders: An Introduction to the FAR

The lobes of the cerebral cortex in the left cerebral hemisphere, shown in lateral view



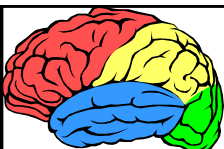
Labels in the diagram include: Frontal lobe, Precentral gyrus, Central sulcus, Postcentral gyrus, Parietal lobe, Lateral sulcus, Occipital lobe, Temporal lobe, Cerebellum, Pons, and Medulla oblongata.

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Steven G. Feifer, D.Ed, ABSNP
feifer@comcast.net
www.schoolneuropsychpress.com

1

1

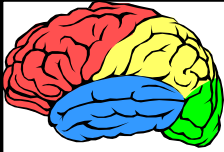


Presentation Goals

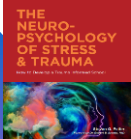

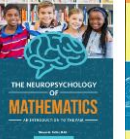
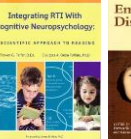



1. Discuss literacy rates in the United States and the need for all schools to screen for developmental dyslexia.
2. Discuss the pitfalls of relying on either an aptitude-achievement *discrepancy model*, or a student's **R**esponse **t**o **I**ntervention, as the sole basis for identifying reading disorders in young children.
3. Introduce a *brain-based* educational model to effectively identify and classify **4 subtypes** of reading disorders, and link specific interventions with each subtype.
4. Discuss four universal truths with respect to reading, and develop a neuropsychological framework for understanding how reading is organized in the brain.
5. Introduce the **FAR**, as a means to better identify and remediate reading disorders and dyslexia in children.

2

2



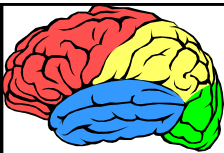
Dr. Feifer's Journey 1993 - ?

- School psychologist 20+ years
- Diplomate in 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 coming soon)
- Currently in private practice at Monocacy Neurodevelopmental Center in Maryland.
- ABSNP Diplomate and Faculty Instructor

3

3



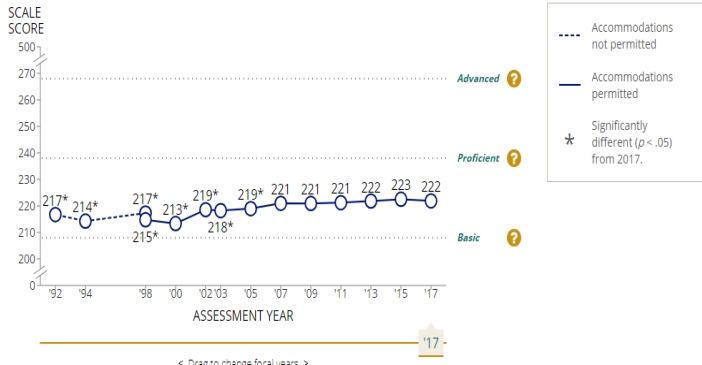
NAEP: Reading 2017

148,800 **4th**-graders from 7,830 schools

The National Center for Education Statistics includes students with disabilities and ELL students and administers reading comprehension measures every two years.

- *1992 - 28% proficient
- *2017 - 37% proficient (CA 31%)

Trend in fourth-grade NAEP reading average scores

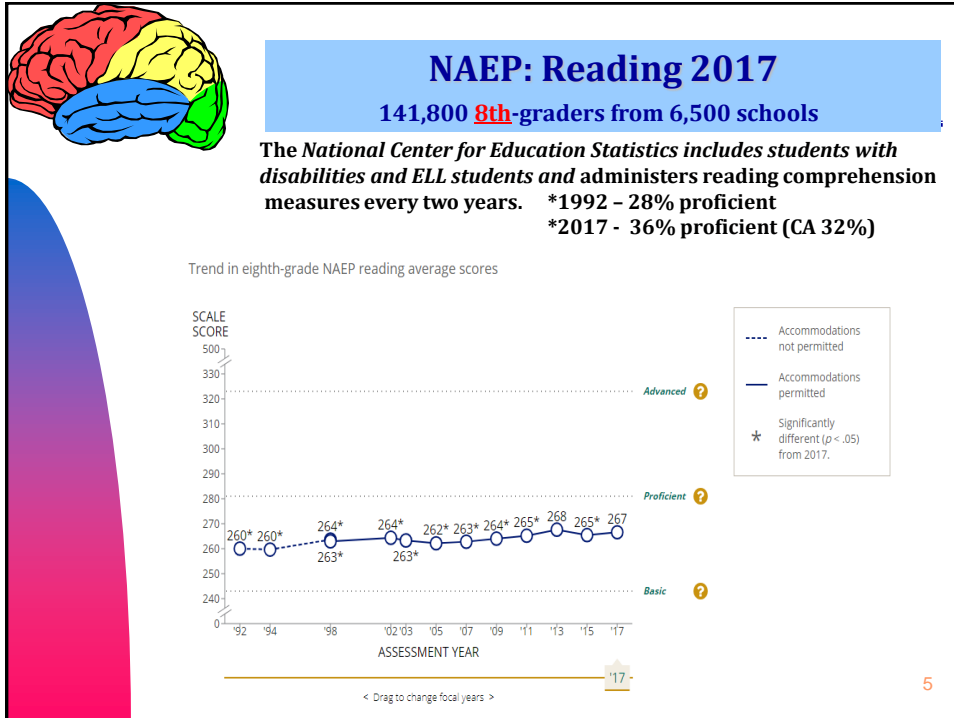


Assessment Year	Accommodations not permitted (Scale Score)	Accommodations permitted (Scale Score)
'92	217*	214*
'94	215*	213*
'98	217*	215*
'00	219*	218*
'02	219*	219*
'03	219*	219*
'05	221	221
'07	221	221
'09	221	221
'11	222	222
'13	223	223
'15	222	222
'17	222	222

< Drag to change focal years >

4

4



5

California Dyslexia Law

The California "Dyslexia Bill" has two main focuses:

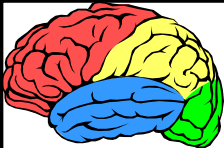
1. AB 1369 text requires an additional section be added to CA Eligibility Criteria for Specific Learning Disability (SLD). This addition, Section 56334, reads: "The State Board of Education shall include "phonological processing" in the description of basic psychological processes in Section 3030 of Title 5 of the California Code of Regulations."
2. The bill calls for the Superintendent of Public Instruction to develop program guidelines for dyslexia to be used to assist teachers and parents to plan, provide, evaluate, and improve educational services to students with dyslexia. These guidelines are to be available to the public in time for implementation in the 2017-18 school year. The Superintendent's guidelines will not change current law nor require the use of any specific curriculum in instruction of students. Instead, they will give guidance for staff in understanding implementation of instructional programs. Further information on the guidelines will be covered later in this document.

As mentioned above, AB1369 requires the addition of "phonological processing" to the "basic psychological processes" in the Eligibility Criteria for Specific Learning Disability (SLD). The bill does not establish a new eligibility category. It simply adds phonological processes to the existing processing areas defined in the current SLD eligibility criteria (CCR Section 56320 § 3030).

Basic Psychological Processes Prior to AB1369	Basic Psychological Processes After AB1369
1. Attention	1. Attention
2. Visual processing	2. Visual processing
3. Auditory processing	3. Auditory processing
4. Sensory-motor skills	4. Sensory-motor skills
5. Cognitive abilities including:	5. <u>Phonological processing</u>
a. Association	6. Cognitive abilities including:
b. Conceptualization	a. Association
c. Expression	b. Conceptualization
	c. Expression

Note: As of Oct. 1, 2016, the addition of phonological processing has not been officially included into the existing California SLD Eligibility Criteria (C.C.R. Title 5). Existing SLD Eligibility Criteria defines SLD as "a disorder in one or more of the basic psychological processes ... including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia"

6



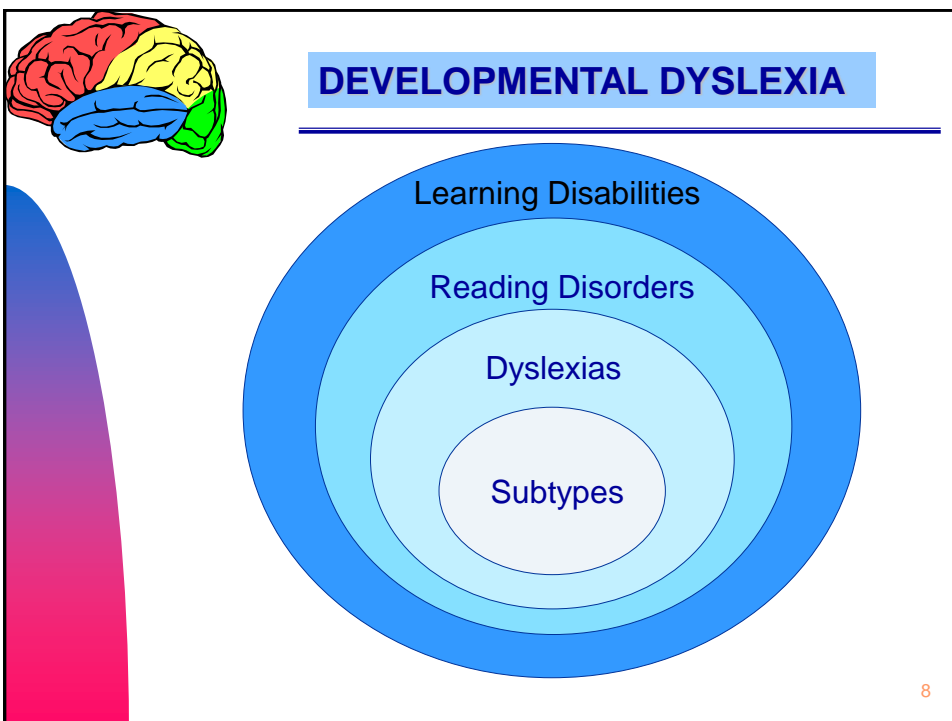
Defining Dyslexia

➤ *“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 phonological 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.”*

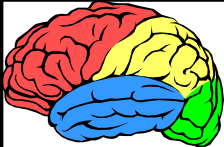
- International Dyslexia Association

7

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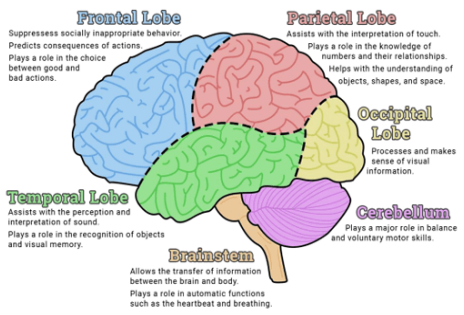
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School Neuropsychology

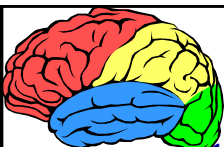
➤ **Neuropsychology:** An analysis of learning and behavior which examines *brain-behavior* relationships. The underlying assumption is that the brain is the seat of **ALL** behavior; therefore, knowledge of cerebral organization should be the key to unlocking the mystery behind most cognitive tasks.

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
- Brainstem**
 - Allows the transfer of information between the brain and body
 - Plays a role in automatic functions such as the heartbeat and breathing
- Cerebellum**
 - Plays a major role in balance and voluntary motor skills

9

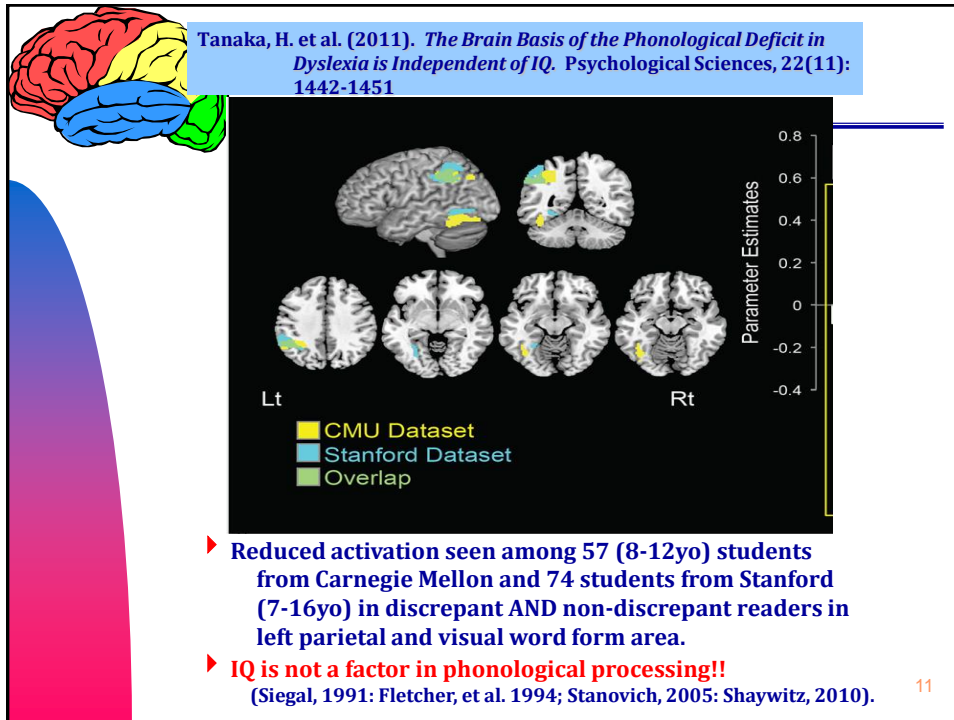


MAIN PITFALLS OF DISCREPANCY MODEL

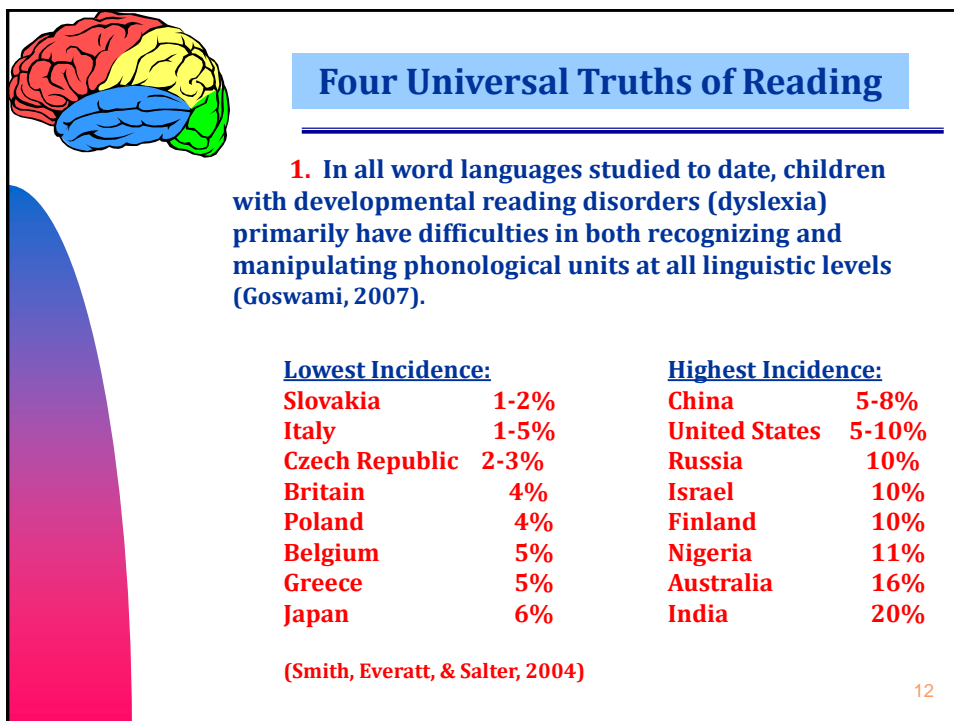
1. There is no universal agreement on what the discrepancy should be.
2. A discrepancy model of reading disabilities precludes early identification.
3. Intelligence is more a predictor of school success, and not necessarily a predictor of successful reading.
4. A discrepancy model promotes a '*wait and fail*' policy, forcing interventions to come after the fact.

Conclusion: *"The use of IQ scores, which is an amalgam of different cognitive tests compiled into a single score lacks the specificity and sensitivity for capturing the exact cognitive deficits associated with different clinical disorders (Decker, Hale, & Flanagan, 2013)."*

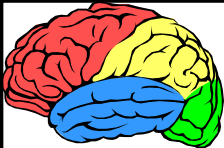
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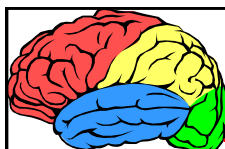


Problems with “Phonological Deficit” Hypothesis of Reading

1. Assumes dyslexia is a homogenous condition.
2. Does not account for the developmental trajectory of phonological awareness being more significant with younger than older readers (Araujo et al., 2010; Frijters et al., 2011).
3. The model fails to account why numerous phonological skills are preserved for disabled readers (Shany & Share, 2011).
4. The model suggests that phonological training is the only course of intervention.
5. Inconsistent with IDA definition and neuroscience.



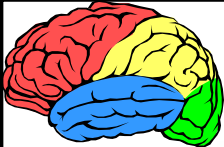
13



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 e a f. The sound /ee/ is represented by the letters ‘e a’.
 - 3 letter grapheme: n i g h t. The sound /ie/ is represented by the letters ‘i g h’.
 - 4 letter grapheme: t h r o u g h. 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 Problem with English Orthography?


IF THE GH SOUND IN ENOUGH IS PRONOUNCED "F"
& THE O IN WOMEN MAKES THE SHORT "I" SOUND
& THE TI IN NATION IS PRONOUNCED "SH"
THEN THE WORD

"GHOTI"

IS PRONOUNCED JUST LIKE



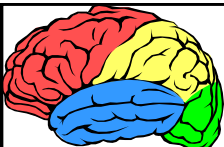
"FISH"



WELCOME TO THE ENGLISH LANGUAGE 🤖

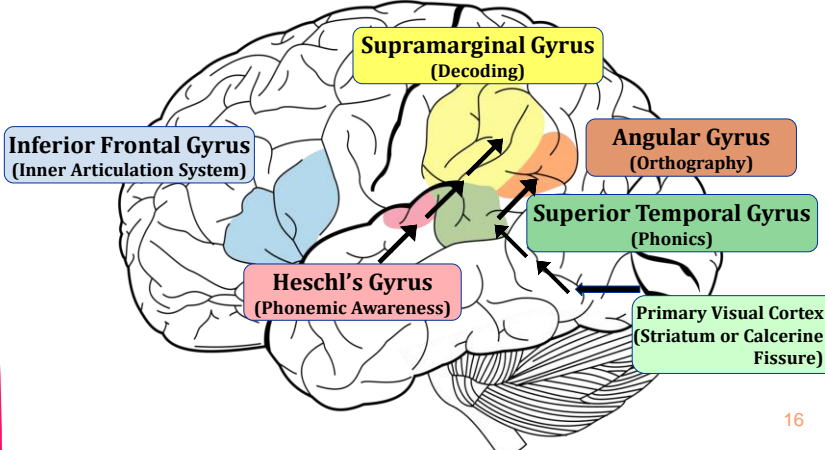
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The Reading Brain: How Words are Assembled

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 (Pugh et al., 2000, McCandliss & Noble, 2003; Shaywitz, 2004; Sandak et al., 2004).



16

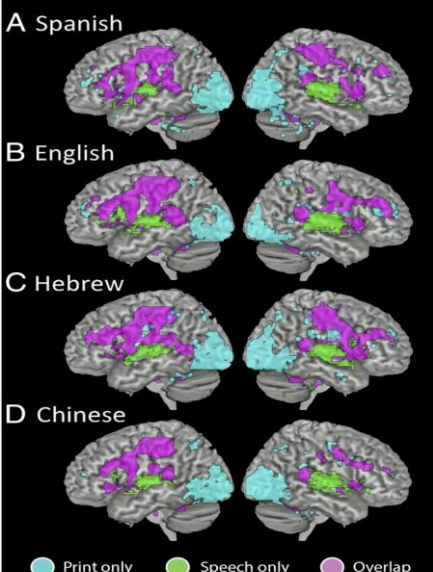
16



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

A Spanish
B English
C Hebrew
D Chinese

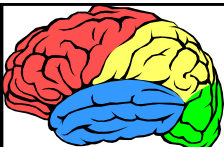


● Print only ● Speech only ● Overlap

- 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).

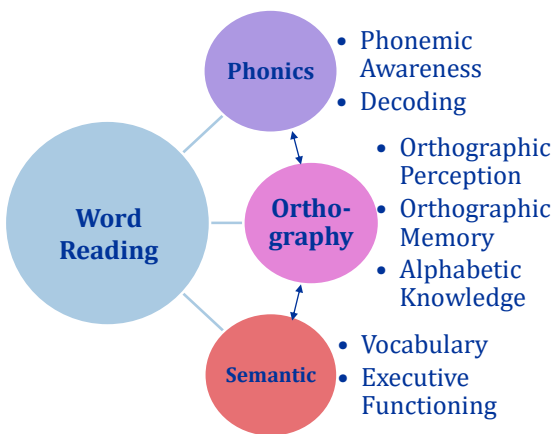
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Multiple Cueing System of Reading

- Recognizes that both **phonological** and **orthographic** and **semantic** cues can facilitate word recognition.



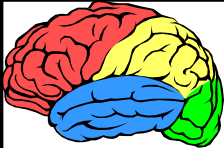
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graph TD
    WR((Word Reading)) --- P((Phonics))
    WR --- O((Orthography))
    WR --- S((Semantic))
    P <--> O
    O <--> S
  
```

- Phonics**
 - Phonemic Awareness
 - Decoding
- Orthography**
 - Orthographic Perception
 - Orthographic Memory
 - Alphabetic Knowledge
- Semantic**
 - Vocabulary
 - Executive Functioning

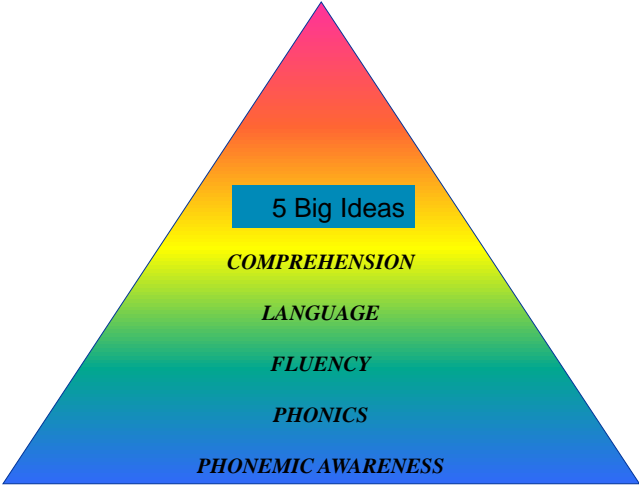
18

18



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:



5 Big Ideas

COMPREHENSION

LANGUAGE

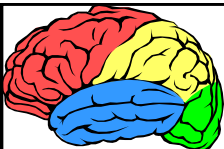
FLUENCY

PHONICS

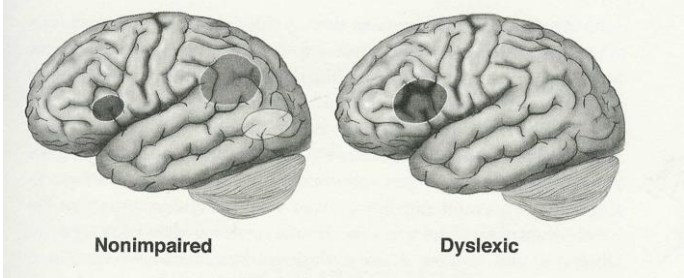
PHONEMIC AWARENESS

19

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NEURAL CIRCUITRY OF DYSLEXIA (Shaywitz, 2003)

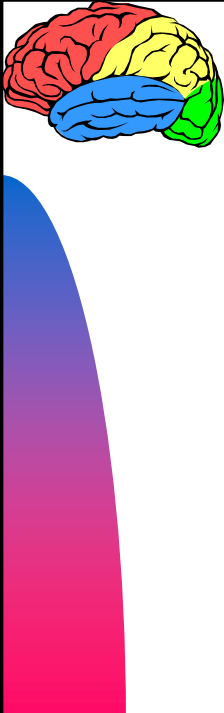


Nonimpaired Dyslexic

- ▶ Nonimpaired readers activate primarily posterior portions of left hemisphere.
- ▶ Impaired readers under-activate posterior regions and activate primarily frontal areas.

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Do Interventions Change the Brain?

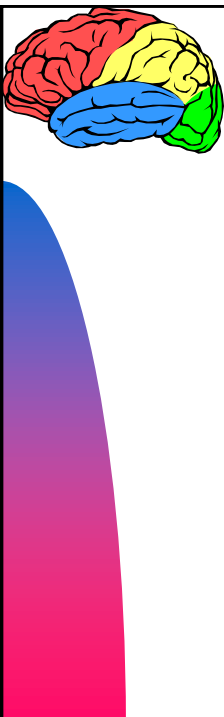
► Barquero, L.A., Davis, N., & Cutting, L. E. (2014). Neuroimaging of reading intervention and activation likelihood estimate meta-analysis. *Plos One*, 9(1), 1-16.

► Research is beginning to show two specific brain changes with LD kids as a result of reading interventions:

1. Hemispheric “**normalization**” – the left hemisphere begins to assert dominance after just four weeks of intervention.
2. Hemispheric “**compensation**” – children with reading difficulty also activate brain structures in the frontal lobe following intervention, suggesting greater text attention and working memory engagement (**IFG**), and enhanced error detection and EF skills (**ACC**).

21

21



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.

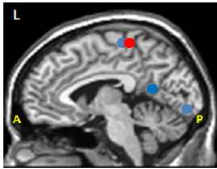
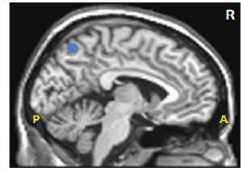
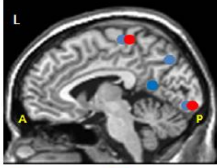
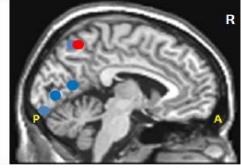
► 33 children with reading disorders 8-12 years-old.

► 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

Typical readers

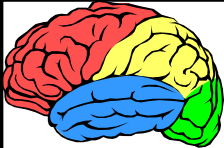
Children with RD

● Test 1 ● Test 2

22

22

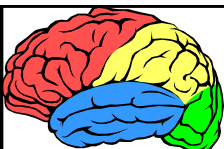


Four Subtypes of Reading Disorders

- (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

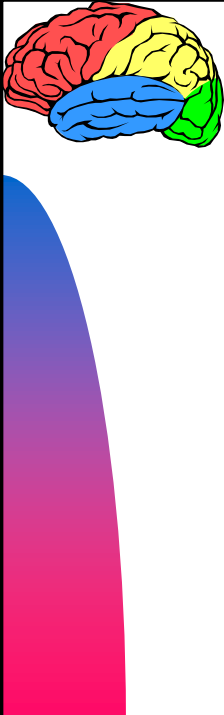
1. **Dysphonetic Subtype** - great difficulty using phonological route in reading, so visual route to lexicon is used. These readers do not rely in letter to sound conversions, but rather over-rely on visual cues to determine meaning from print.

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

<u>Target Word:</u>	<u>Read As:</u>
<i>cat</i>	<i>couch</i>
<i>balloon</i>	<i>ball</i>
<i>jump</i>	<i>gym</i>
<i>ghost</i>	<i>goat</i>

24

24

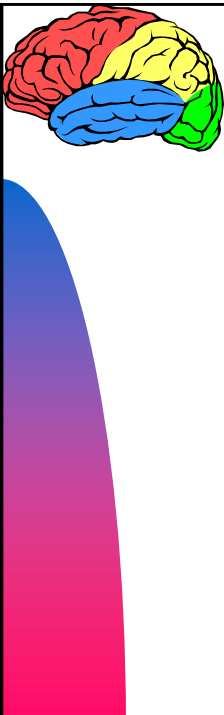


REMEDATION STRATEGIES FOR DYSPHONETIC DYSLLEXIA

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

25

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The Morphological Connection (“Top-Down”) (Senechal & Kearnan, 2007)

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

***Prefixes:** ante, extra, mis, para, pre, retro, super*

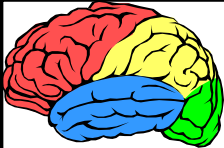
***Suffixes:** able, tion, ment, ness, ship, tude, ward, ible*

***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.
- ▶ 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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SUBTYPES OF DYSLEXIA

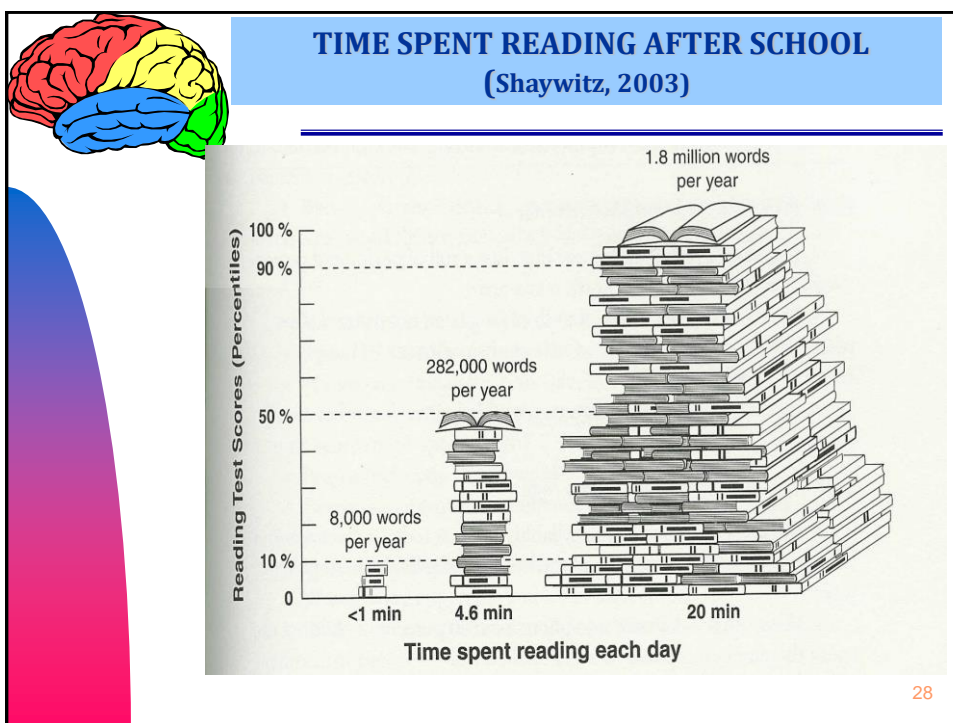
2. **Surface dyslexia** - an over-reliance on sound symbol relationships as the process of reading never becomes automatic. These children break every word down to its phonetic base, and read slowly due to poor **orthographic processing**.

<u>WORD</u>	→	<u>READ AS</u>
island	→	izland
grind	→	grinned
listen	→	liston
begin	→	beggin
lace	→	lake

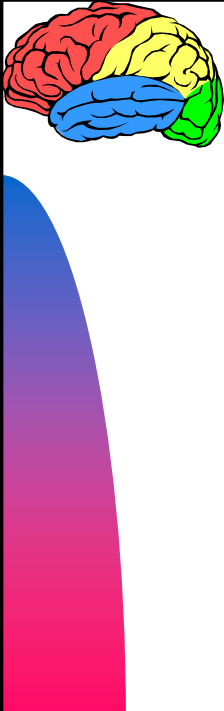
► Extreme difficulty reading words where phonemes and graphemes are not in 1 to 1 correspondence: **yacht**
debt

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27



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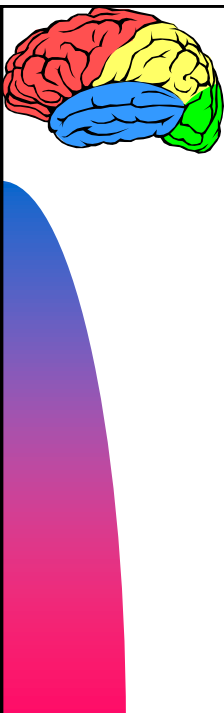
Skilled Readers Dominant Pathway

▶ According to a research at an English university, it doesn't matter in what order the letters in a word are, the only important thing is that first and last letter is at the right place. The rest can be a total mess and you can still read it without problem. This is because we do not read every letter by itself but the word as a whole.

▶ <http://www.spritzinc.com>

29

29

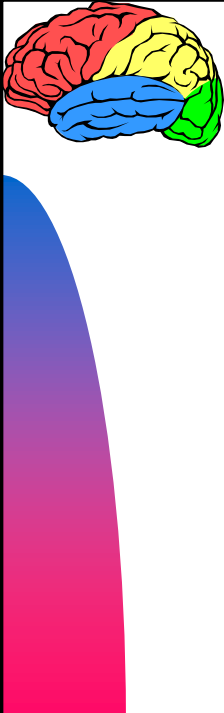


REMEDIATION OF SURFACE DYSLEXIA

<u>Over Age 12:</u>	Academy of Reading Wilson Reading System Laubauch Reading Series Read 180
<u>Ages 7 - 12:</u>	Read Naturally Great Leaps Reading Quick Read RAVE-O Fast Track Reading
<u>Under Age 7:</u>	Destination Reading Reading Recovery Early Success Fluency Formula

30

30



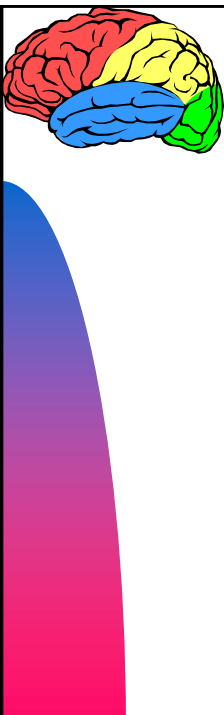
SUBTYPES OF DYSLEXIA

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

<u>WORD</u>	<u>READ AS:</u>
Advice	Exvices
Correct	Corex
Violin	Vilen
Museum	Musune
Possession	Persessive
Material	Mitear

► Multiple breakdowns along many pathways modulating the entire reading process.

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4 REMEDIATION STRATEGIES FOR MIXED DYSLEXIA

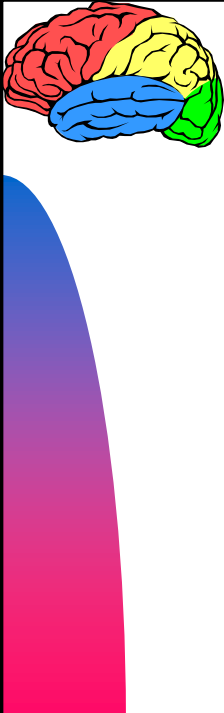
(1) Balanced Literacy - An eclectic and approach capitalizing on the particular strengths of the child. Consider using a multi-sensory type of Orton-Gillingham program, coupled with a fluency model such as Read Naturally, and the computerized models of Read 180.

(2) Top Down Strategies - Often atypical development mapping individual sounds to the visual word form association areas (Temple, 2002; Shaywitz, et al, 2003; Noble & McCandliss, 2005).

(3) Socioeconomic Status - According to Noble and McCandliss (2005), socioeconomic status (SES) 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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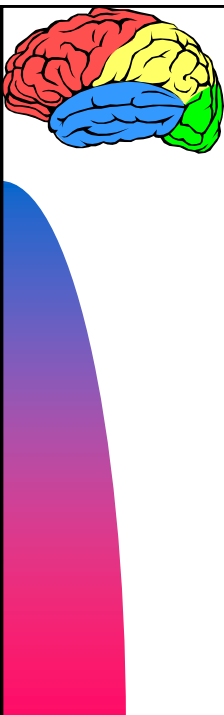


Read 180 (Dr. Ted Hasselburg)

- ▶ A 90 minute per day balanced literacy program.
- ▶ Designed for grades 4th – 12th.
- 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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33

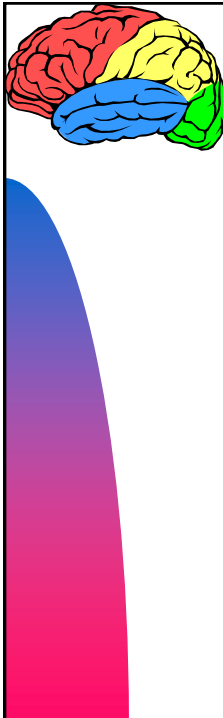


4 Components of Reading Comprehension

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-monitor performance and organize information on a given problem solving task.
4. **Language Foundation** – most children enter kindergarten with 3000 – 5000 words, though graduate from high school with 60,000 words (Pinker, 1994).

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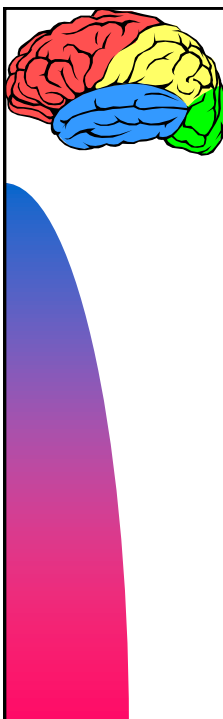
34



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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Comprehensive Reading Evaluation

- ▶ Intelligence tests (Gc)
- ▶ Phonemic/Phonological Awareness (Ga)
- ▶ Rapid Naming (Glr)
- ▶ Verbal Memory Tests (Gsm)
- ▶ Reading Fluency (Gs)
- ▶ Orthographic Skills (Gv)
- ▶ Attention (Gs)
- ▶ Executive Functioning (Gf)

*** INTEGRITY NOT DISCREPANCY**

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Steven G. Feifer, D.Ed., ABSNP

- 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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Structure of the FAR

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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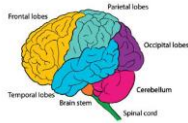


PHONOLOGICAL INDEX

- Phonemic Awareness (rhyming, blending, segmenting, and manipulation of sounds)
- Positioning Sounds
- Nonsense Word Decoding
- Isolated Word Fluency
- Oral Reading Fluency (accuracy)



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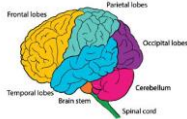


PHONOLOGICAL INDEX

- Phonemic Awareness (rhyming, blending, segmenting, and manipulation of sounds)
- Positioning Sounds
- Nonsense Word Decoding
- Isolated Word Fluency
- Oral Reading Fluency (accuracy)



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Phonemic Awareness: Rhyming

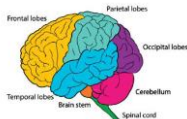

All grades

“I’m going to say two words, and I would like you to tell me if they rhyme (sound the same).”

Rhyming (PK-2nd): Fish, dish

41


Phonemic Awareness: Blending

All grades

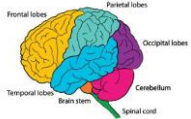

“Now I am going to say parts of words. I want you to put the parts together to make a whole word.”

Blending (9th+) : Advantage

Item	Correct response	# of syllables	Score
ad : van : tage	advantage	3	0 1




42

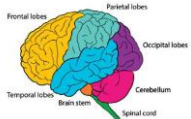

Phonemic Awareness: Segmenting

“Now I am going to say a word. I want you to say the word back to me one part at a time and tap the table for each part you hear.”

	Item	Correct response	Correct # of taps	Score
PK-2nd	1. toothpaste	tooth : paste	2	0 1
	2. wagon	wa : gon	2	0 1




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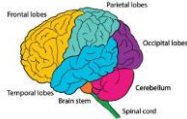

Phonemic Awareness: Manipulation

“I am going to say a word and then take of its sounds away.”

9.	Say "bend" without the /b/ sound.	end	0 1
10.	Say "cord" without the /d/ sound.	core	0 1




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Positioning Sounds Sample Item

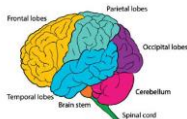

"I'm going to say a word. I want you to tell me which sounds are missing in the word."

All grades



d		ll
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Nonsense Word Decoding

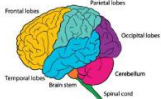

2nd + Only

"I want you to read each of these words out loud without skipping any. Ready? Begin."

conving magip pibstat canians



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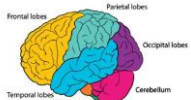




Isolated Word Reading Fluency (60 sec)...

Table 1.4 (continued)
Skills Analysis for Isolated Word Reading Fluency (ISO)
Versus Oral Reading Fluency (ORF)

Grade 2 to Grade 3							
Story 1				Story 2			
ISO item number	Target word	Correct ISO?	Correct ORF?	ISO item number	Target word	Correct ISO?	Correct ORF?
31	airplane	0 1	0 1	46	once	0 1	0 1
38	large	0 1	0 1	47	alligator	0 1	0 1
33	wings	0 1	0 1	44	morning	0 1	0 1
40	able	0 1	0 1	41	swim	0 1	0 1
35	have	0 1	0 1	52	pond	0 1	0 1
29	kitchen	0 1	0 1	45	yesterday	0 1	0 1
27	inside	0 1	0 1	42	nails	0 1	0 1
34	bed	0 1	0 1	51	truck	0 1	0 1
30	house	0 1	0 1	50	wise	0 1	0 1
37	black	0 1	0 1	43	blanket	0 1	0 1
26	all	0 1	0 1	55	circle	0 1	0 1
28	grass	0 1	0 1	49	scratched	0 1	0 1
36	money	0 1	0 1	54	after	0 1	0 1
39	because	0 1	0 1	48	crossed	0 1	0 1
32	fast	0 1	0 1	53	soup	0 1	0 1
Number correct		/15	/15	Number correct		/15	/15
% correct				% correct			

47

Oral Reading Fluency

60 seconds per passage; incorporates Isolated Word Fluency words within each passage


Grades 4-5, Story 2

Stim Book view

Sam was very excited about the field trip to the aquarium. (He was so excited that he almost forgot to give his permission form to the school secretary!) After the students arrived, they were shown into a large room to view the fish. An invisible wall made of thick glass made it seem like the students were under water. Sam noticed an old barrel where jellyfish lived.

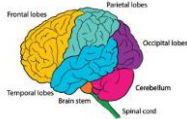

Record Form view

Sam was very excited about the field trip to the **aquarium**. (He was so excited that he almost forgot to give his **permission** form to the school **secretary**!) After the students arrived, they were shown into a large room to **view** the fish. An **invisible** wall made of **thick** glass made it seem like the students were under water. Sam noticed an old barrel where jellyfish lived.




*** Recent studies have expanded the notion of decoding to include whole word recognition (de Oliveira et al., 2014).**

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FLUENCY INDEX

- Rapid Automatic Naming (objects, letters, stencils)
- Visual Perception (letters, words)
- Orthographic Processing (words and nonwords)
- Irregular Word Reading Fluency
- Verbal Fluency (categories, letters)




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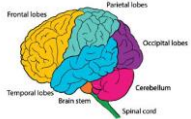




Rapid Automatic Naming

x q e v t g i o
f h z u y d k e



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Visual Perception

All Grades

One 30-second Trial; Letters (PK-2nd) or Words (3rd +)

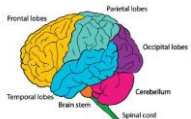

Letters

b i y w a v o q
t q t e x n i o

Words

shady tired telephone assist calendar

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Orthographical Processing

The student chooses which letters
appeared in presented word

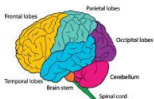

Initial Presentation

Response Options

epiphany

eph phi pip iny



52

Irregular Word Reading Fluency (60 sec)

Item	Pronunciation guide	Score
41. ratatouille	ˈra-ta-ˈtū-ē, ˈra-ta-ˈtwē	0 1
42. mesquite	mē-ˈskēt	0 1
43. heir	ˈer	0 1
44. malign	mē-ˈlīn	0 1
45. rescind	ri-ˈsind	0 1
46. motif	mō-ˈtēf	0 1
47. subtle	ˈsə-təl	0 1
48. awry	ə-ˈrī	0 1
49. prerogative	pri-ˈrā-gə-tiv	0 1
50. conscience	ˈkän(t)-shən(t)s	0 1
51. corps	ˈkôr	0 1
52. deign	ˈdān	0 1
53. queue	ˈkyū	0 1
54. mnemonic	ni-ˈmä-nik	0 1

53

Verbal Fluency

All Grades


Two 60-second trials

“For this task, I would like you to tell me all the different foods you can think of without repeating any.”

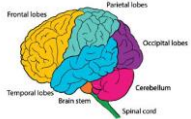

0-15 seconds	16-30 seconds	31-45 seconds	46-60 seconds
No. novel words	No. novel words	No. novel words	No. novel words

Trial 1 subtotals

Number correct	Number of errors
----------------	------------------




54

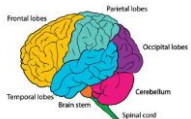




COMPREHENSION INDEX

- Print Knowledge (grades PK-1)
- Semantic Concepts (synonyms, antonyms)
- Morphological Processing
- Word Recall
- Silent Reading Fluency (literal & inferential questions)



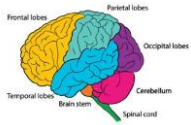

55

Semantic Concepts All Grades

<p>Synonyms Presentation</p> <p style="text-align: center; font-size: 1.5em;">error</p> <p>earn blunder correct chance grasp</p>	<p>Antonyms Presentation</p> <p style="text-align: center; font-size: 1.5em;">divide</p> <p>reject deride split combine hinder</p>
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Morphological Processing

2nd + only

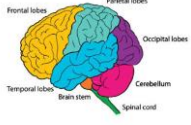

72 items

“I’m going to show you an incomplete word and then ask you to choose the group of letters that completes the word.”

____antic

ped sho tel com prod

57

Word Recall

☐ **PK-Grade 2**

Item
1. chain
2. drum
3. pepper
4. wheel
5. guitar
6. celery
7. brake
8. trumpet
9. tomato

☐ **Grades 3+**

Item
1. chain
2. drum
3. pepper
4. wheel
5. guitar
6. celery
7. brake
8. trumpet
9. tomato
10. handlebars
11. piano
12. carrot

Trial 2: Bicycle words			
			Intrusions
chain	<input type="checkbox"/>	R	
wheel	<input type="checkbox"/>	R	
brake	<input type="checkbox"/>	R	
3 rd + handlebars	<input type="checkbox"/>	R	

Trial 2: Musical instruments			
			Intrusions
drum	<input type="checkbox"/>	R	
guitar	<input type="checkbox"/>	R	
trumpet	<input type="checkbox"/>	R	
3 rd + piano	<input type="checkbox"/>	R	

Trial 2: Fruits and vegetables			
			Intrusions
pepper	<input type="checkbox"/>	R	
celery	<input type="checkbox"/>	R	
tomato	<input type="checkbox"/>	R	
3 rd + carrot	<input type="checkbox"/>	R	

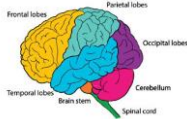

Trial 2 subtotals

Number correct	Repetitions	Intrusions

To calculate the Word Recall total, transfer the Trial 1 and Trial 2 subtotals to the appropriate spaces below. Sum the number correct subtotals and record this value in the space provided.

Trial 1 subtotals		
Trial 2 subtotals	+	
Word Recall (WR) total	=	
	Repetitions	Intrusions
Number correct		

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Silent Reading Fluency

2nd + only

2 passages and 8 questions



Grades 11+ Story 1

The legacy of James Madison goes well beyond that created by being the fourth president of the United States. In fact, perhaps no other individual in history has had a more profound role in shaping the basic tenets of our society. A noted political philosopher, Madison was the principal author of the Constitution and introduced the Bill of Rights, considered by many to play an essential part in maintaining a balance of power between the individual and the federal government. Some Bill of Rights clauses include the right to free speech, the right to a free press, the right to bear arms, and the right to free assembly. Furthermore, it was Madison who argued for a three-branch federal system, which ultimately became the basis for our government today. His great adversary, Alexander Hamilton, proposed a republic dominated by a strong central government and national bank. Madison combated this notion by forging an alliance with Thomas Jefferson to create the Democratic-Republican Party. Madison eventually retired to Virginia and served as a college chancellor to the University of Virginia until his death. Today, James Madison University, also in Virginia, remains a thriving institution in his honor.

Grades 11 + Story 1 Questions

1. What number president was Madison?
2. Who was Madison's chief political adversary?
3. Who did Madison form an alliance with to create the Democratic-Republican party?
4. What college did Madison eventually preside over?
5. What Bill of Rights clauses does the passage mention?
6. Beyond being one of our presidents, what are Madison's other legacies to the American people?
7. What does the word "free" imply in this passage?
8. Why do you think Madison opposed a republic dominated by a strong central government?

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CASE STUDY #1

► Maxwell is 7 yrs old and in the 2nd grade. He was referred for a comprehensive assessment due to his poor decoding skills, poor response to interventions, and limited educational progress.

FAR index	Standard score (95% CI)	Percentile	Qualitative descriptor
Phonological Index	72 (±5)	3%	Moderately below average
Fluency Index	90 (±7)	25%	Average
Comprehension Index	97 (±8)	42%	Average
Mixed Index	78 (±5)	7%	Below average
FAR Total Index	83 (±5)	13%	Below average

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CASE STUDY #1

Phonological Index: the Phonological Index score represents an absolute weakness: **72 ±5**, which is in the *Moderately Below Average* range and at the **3rd** percentile compared to his peers. This score is also considered a relative weakness, since it is statistically discrepant from his FAR Total Index score (11 points; $p < .01$; <15% of standardization sample).

Key Analysis: Maxwell performed significantly better on the Irregular Word Reading Fluency subtest (**ss = 95**), a test which required him to read isolated words with phonologically inconsistent spellings, than on the Nonsense Word Decoding subtest (**ss=75**). This suggests that he primarily memorizes whole words and does not yet possess the skills to decode and blend individual words by sounds.

* Maxwell presents with **Dysphonetic Dyslexia**

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Fundations	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 Forward 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**—The development of phonological processing occurs in a hierarchical progression. 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 diphthongs.
3. **Tile Spelling**—Practice spelling words with grapheme tiles. Color coding vowel digraphs (back-to-back vowels making one sound) such as chair or caution 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 “cat”
 - b) Open syllables—ends in long vowel, such as “baby”
 - c) Vowel-Consonant E Syllables—silent ‘e’ elongates vowel, such as “make”
 - d) Vowel-Team Syllables—two vowels make one sound, such as “caution”
 - e) R-Controlled Syllables—vowel followed by ‘r’ changes sound, such as “hurt”
 - f) Consonant-le Syllables—end of word ending in ‘le’, such as “turtle”
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.

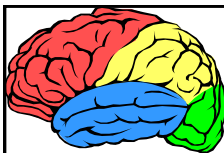
64



THE FAR ADVANTAGE

- Based upon a gradential 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 **“T”** back in **IEP’s!!!**

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Let's Stay Connected!



Steven G. Feifer, D.Ed., ABSNP
Licensed Psychologist

Workshops: feifer@comcast.net

Books: www.schoolneuropsychpress.com
[@schoolneuropsychpress](https://twitter.com/schoolneuropsychpress)

Tests: FAR- 2015 FAM- 2016 FAW - 2020
Psychological Assessment Resources

66

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