

# Best Practices in Dyslexia Assessment

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CASP

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# Main Sources of Information

- *Essentials of Dyslexia Assessment and Intervention, Mather & Wendling*
- *Essentials of Assessing, Preventing, and Overcoming Reading Difficulties, Kilpatrick*
- *Psychological Processing Analyzer, Dehn*
- *Reynolds Early Assessment of Dyslexia (READ)*
- *Reynolds Dyslexia Risk Questionnaire (RDRQ)*

# Workshop Content

1. What is dyslexia
2. Different types of dyslexia
3. Orthographic processing
4. Brain basis of dyslexia
5. General assessment recommendations
6. Related neuropsychological processes
7. Specific processes to assess
8. Using PSW to identify dyslexia
9. Newer, specific scales to use
10. Case study

# Dyslexia Definition

“a neurobiological disorder that causes a marked impairment in the development and basic reading and spelling skills”

# IDA Dyslexia Definition

“Dyslexia is a specific learning disability that is neurobiological in origin. It 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...”

# IDEA Inclusion of Dyslexia Under SLD

SLD is “a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may have manifested itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, **dyslexia** and developmental aphasia.” DSM-V also has it under SLD types.

# CA CDE Guidelines

1. Dyslexia is a specific learning disability, but a dyslexia diagnosis does not automatically qualify for SLD
2. May be served in regular ed
3. Mentions processing disorders, phonological processing, and neuropsychological processes, such as rapid naming
4. Mentions psychs understand PSW



# Dyslexia vs Reading Disability

1. Is it not the same thing as a specific learning disability in basic reading skills?
2. Most parents think it's something different
3. Most educators think it's something different.
4. Many experts think it's the same.
5. All 50 states now have separate dyslexia legislation, many indicating that it something different than an SLD in basic reading skills

# How Dyslexia is Different

1. It's not just an IQ – Achievement discrepancy
2. There are clear neurological weaknesses
3. Phonological and/or orthographic processing weakness(es) should be present
4. Spelling weakness is present
5. The reading problem is more severe and resistant to intervention

# Dyslexia Misconceptions

1. It's a visual problem only.
2. It's a problem recognizing individual letters and their phonemes.
3. It's seeing and reading letters/words backwards.
4. It's different than a "reading" disability

# Dyslexia Subtypes

1. Deep (Dysphonetic Dyslexia/Phonological Dyslexia) – problems applying phonological rules and a weakness in phonological processing; difficulty with nonword reading
2. Surface (Orthographic Dyslexia/Dyseidetic Dyslexia) – low sight word vocabulary, weak reading of irregular words, slow rate, spelling errors, especially with irregular words
3. Mixed – both surface and deep

# Dyslexia Subtypes Controversy

1. Some research says there are no subtypes
2. The most appropriate diagnoses in most cases may be “Mixed”

# Mixed Dyslexia

1. Phonology enables the initial formation of word representations
2. Orthography provides more detailed representations that are the gateway to highly skilled reading
3. Consistent with dual route theory

# Phonological and Orthographic Relations

1. Younger children rely more on phonological
2. Older children more on orthographic
3. But some basic orthographic mapping begins early, before phonetic decoding
4. Vary depending on whether language is transparent (spelling is mostly phonetic) or opaque (English)
5. Strong vocabulary may mask weaknesses in either one (context will help)

# Reading Fluency

1. Does not seem to be a stand-alone reading disability
2. It depends on a large sight word vocabulary, which depends on orthographic processing/memory
3. Oral reading fluency is usually a weakness in dyslexia



# Orthographic Processing

“the ability to visually recognize and remember printed words and parts of words. It includes the ability to recognize letter sequences and patterns and to spell phonetically irregular words”

1. Considered a specific ability that is often deficient in dyslexia
2. Different from broad visual-spatial processing
3. Orthographic is specific to symbols/letters
4. Now stands alone Dehn's PSW software
5. Not listed in CHC model

# Orthographic Processing and Reading

1. Orthographic is recognizing words and parts of words by sight, such as prefixes, suffixes, and roots
2. Necessary for
  1. Reading decoding/basic reading skills
  2. Reading fluency
  3. Written expression (spelling)
3. Not a direct influence on reading comp.

# Orthographic Mapping

1. Process of turning unfamiliar written words into instantly accessible sight words
2. This mapping determines whether readers will easily remember the words they see
3. Normal readers map a new word in as few as 1-4 exposures
4. Dyslexic readers: it takes many, many exposures >10
5. Phonics helps identify unfamiliar words but does not necessarily promote instant word recognition
6. Good working memory, especially visual-spatial may support orthographic mapping

# Orthographic Mapping Requires

1. Advanced phonemic awareness
2. Letter-sound knowledge
3. Phonological long-term memory
4. The oral pronunciations of words already stored in long-term memory are the anchoring points for the orthographic sequences
5. Phonic decoding is part to whole
6. Orthographic mapping is whole to part

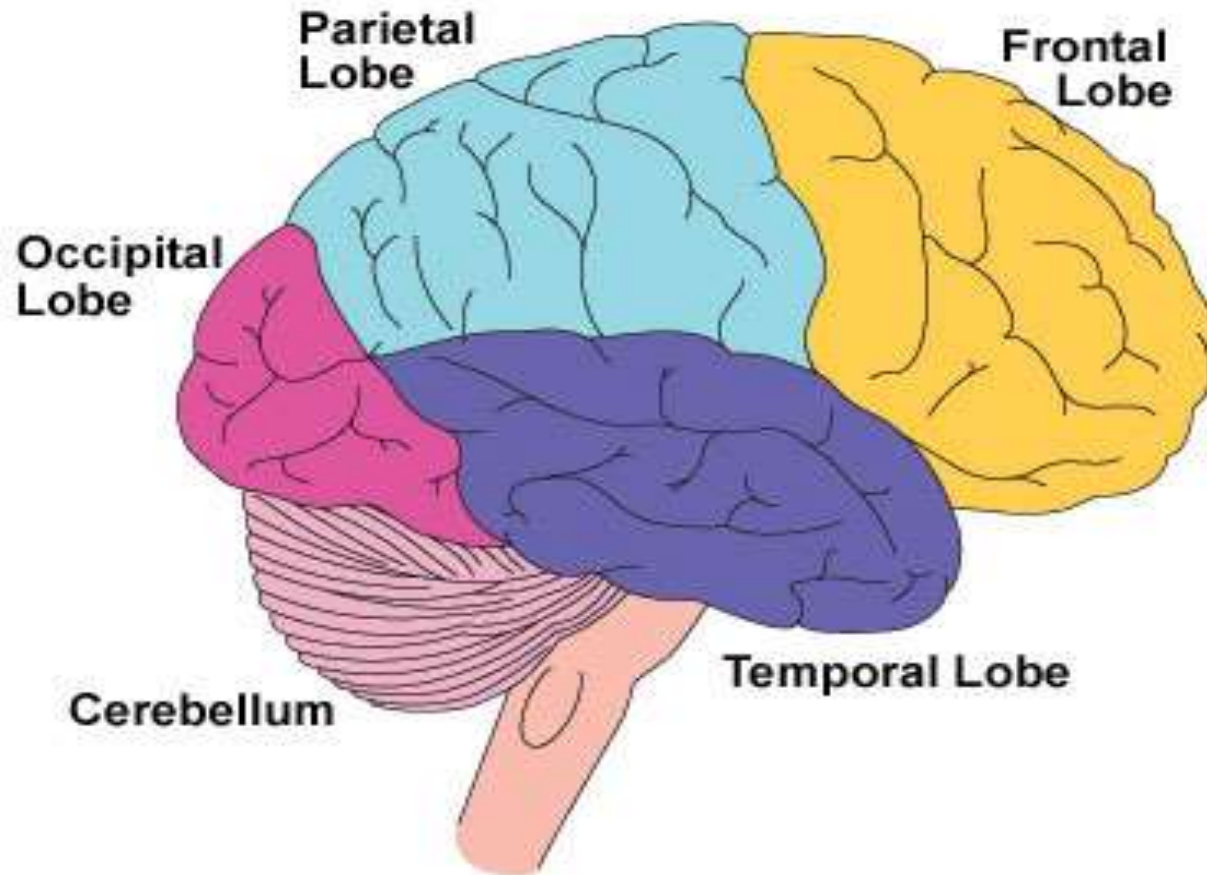
# Orthographic Memory

1. Stored phoneme sequences are aligned with printed letter sequence
2. We do not store words according to their visual properties but rather the alignment of the letter sequence and the phoneme sequence in the word's pronunciation
3. Recalls common spelling patterns such as "tion" and "ight"

# Orthographic Knowledge

1. What is permissible and not permissible in English language spelling, such as “ight” versus “tbl” or triple letters
2. Learning the common letter patterns such as *ing, ed, tion, ough*

# The Brain and Dyslexia



# The Brain and Dyslexia

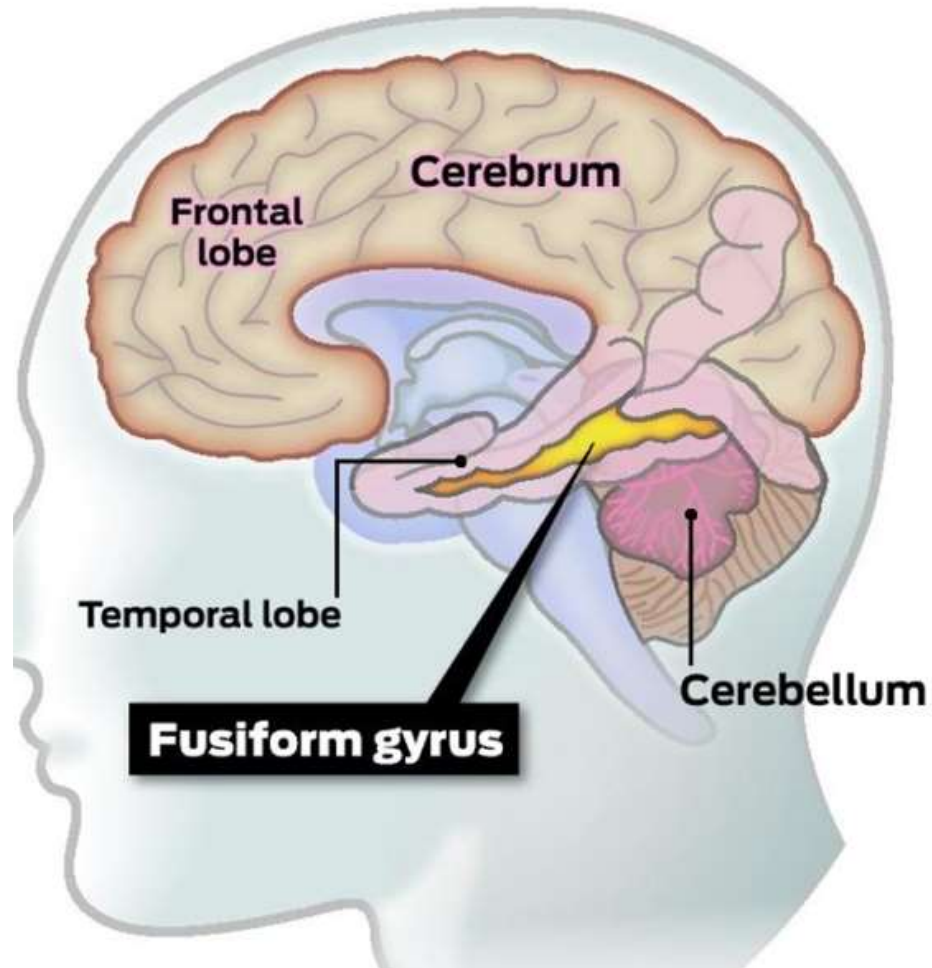
1. Inefficient functioning of left posterior reading systems
2. Less use of the parietotemporal word analysis/phonics area
3. Less use of the left occipitotemporal area referred to the “visual word-form area”
  1. Functions as a memory area
  2. This integrates phonology and orthography, but how is unknown
4. Dyslexic brains process information slower



# Orthographic Mapping

1. Is in the fusiform gyrus, an area that overlaps the temporal and parietal lobes in the lower part of the cortex in both hemispheres
2. This is where letter sequences are stored and retrieved from
3. In dyslexics the left fusiform gyrus is not very active
4. All the letters in a word are then perceived in a single glance

# Fusiform Gyrus



# Fusiform Gyrus

“The fusiform gyrus, also known as the occipitotemporal gyrus, is part of the temporal lobe and occipital lobe. Though the functionality of the fusiform gyrus is not fully understood, it has been linked with various neural pathways related to recognition. Additionally, it has been linked to various neurological phenomena such as dyslexia”

- Also, face recognition area

# Genetics

1. If parent has dyslexia, 30-50% of the children will
2. If one child has, 50% of siblings will
3. Both phonological and orthographic deficits have a strong genetic component
4. However, orthographic processing/memory development are at least partially dependent on exposure to symbols and print

# Ranking of Strengths to Weaknesses in Dyslexia (Kilpatrick)

1. Intelligence
2. Listening comprehension
3. Reading comprehension
4. Decoding words in context
5. Decoding words in lists
6. Nonsense word reading and spelling

# Dyslexia Assessment Recommendations

1. Test phonological
2. Test orthographic
3. Test spelling
4. Oral reading fluency will be weak if it is dyslexia, but no need to directly test it
5. Reading comprehension will be limited to decoding level, but no need to directly test it
6. Test related neuropsychological processes
7. Follow a PSW model for dyslexia testing

# Reading Skills to Assess for Dyslexia

- 1. Letter Recognition**
- 2. Word Recognition**
- 3. Spelling**
- 4. Decoding**
5. Reading Fluency
6. Comprehension

# Assess Neuropsychological Processes Highly Related to Dyslexia

1. **Phonological**
2. **Orthographic**
3. Auditory
4. **Oral Language (Morphological Awareness)**
5. Processing Speed
6. Verbal Long-Term Recall
7. Visual-Spatial Long-Term Recall
8. **Rapid Automatic Naming**
9. **Verbal Working Memory**
10. **Visual-Spatial Working Memory**

(Basically the same processes as those needed for Basic Reading Skills)

How it compares to other SLD categories [Link](#)



# PSW and Dyslexia

1. A pattern of cognitive strengths and weaknesses
2. Look for processing weakness that are related to the learning weakness
3. Cognitive weaknesses cause, are associated with/account for the learning problem

# Dyslexia Processing Deficits

1. Auditory and Visual-Spatial are too broad
2. Are often average in those with dyslexia
3. Narrow abilities are better
4. Phonological instead of auditory
5. Orthographic instead of visual-spatial
  1. Orthographic is more specific to symbols---the alphabet and sequences and patterns of letters

# Orthographic vs Visual Processing

1. Visual-Spatial involves shapes, designs, pictures, objects, location
2. Orthographic is specific to letters and words and symbols that represent words

# Phonological Awareness

1. Ability to perceive and manipulate the speech sounds that make up words
2. Words, syllables, and phonemes
3. Phonemic Awareness
  1. Aware of and manipulation of phonemes
  2. 42-44 in English

How many ways can you spell 44 sounds in American English?

The answer is why English is an opaque language that challenges both phonological and orthographic.

# Phonological Assessment

1. Nonsense words are ideal
2. Phoneme segmentation is the least sensitive phonological assessment task
3. Blending is slightly better
4. Manipulation is the best: replacing, deleting, reversal

# Levels of Phonological Processing in Order of Difficulty (Kilpatrick)

1. Rhyming
2. Segmenting
3. Blending
4. Deleting (Elision)
5. Replacing
6. May do fine with rhyming, segmenting, and blending, but poorly on deleting and replacing
  1. Note which type required by the test when using Phonological scores for diagnosis

# Processing Speed

1. Processing speed affects reading rate and automatic word recognition
2. May explain link between RAN and reading

# Dyslexia and Working Memory

1. Well-established connection, (see Dehn article) but may have average WM
2. An average WM can be overloaded during a cumbersome decoding and retrieval process (too much cognitive load)
  1. May forget sounded out phonemes before they can be blended
3. A long-term memory storage and retrieval problem also adds to cognitive load



# Dyslexia and Long-Term Memory

1. They can't remember pronunciation and spelling of phonetically irregular words
2. Dehn's Observation: Long-term memory for words is not organized phonetically
  1. E.g., can't name words that begin with a specific phoneme

# Rapid Automatic Naming

1. Ability to name familiar objects, **symbols**, or **letters** quickly
2. A specific type of long-term recall
3. Deficits associated with reading problems
4. Is the second part of the “double deficit”
5. Is especially related with orthographic reading---reading phonetically irregular words

# Dyslexia and Memory

1. All types of memory processes are important for reading
2. A deficit in one or more memory processes is frequently related to dyslexia
3. [Link](#) See memory subprocesses from the Memory Processes Analyzer

# Morphology

“In linguistics, morphology is the study of words, how they are formed, and their relationship to other words in the same language. It analyzes the structure of words and parts of words, such as stems, root words, prefixes, and suffixes. Morphology also looks at parts of speech, intonation and stress, and the ways context can change a word's pronunciation and meaning.”

# Morphology and the PPA

1. Part of morphology is recognizing how word parts such as prefixes and suffixes change the meaning of a word
2. Morphology is part of oral language
3. Can use scores from speech therapist
4. Enter under PPA Oral Language area as an unlisted score if necessary
5. Normally developed morphology can support orthographic processing

# Assessing Orthographic Processing

1. Spelling, especially phonetically irregular words
2. Letter-pattern matching
3. Word reading fluency, especially phonetically irregular words (should be timed)
4. Memory for words and word patterns
5. Special “orthographic” subtests
6. See PPA [list](#)

# Irregular Words

1. Even phonetically irregular words typically have only one irregular letter-sound relationship, such as island
2. More than one irregular relationship in a word is unusual, e.g., words such as “one” which is pronounced as wun
3. When teaching irregular words, they should be analyzed and the parts that are phonetically regular and irregular should be pointed out

# TOWRE-2

1. Test of Word Reading Efficiency
2. Has timed nonsense word reading subtest
3. and timed reading of real words
4. If untimed, examinee can decode phonetically
5. May be too easy for older students
6. KTEA-3 Decoding Fluency subtest is similar



# KTEA-3 Orthographic Processing

1. Spelling
2. Letter-Naming Facility
3. Word Recognition Fluency

# TIWRE

1. Test of Irregular Word Reading Efficiency
2. Uses only irregular words
3. But is not timed

# TOC

1. *Test of Orthographic Competence (TOC)*
2. Several subtests
3. Based on tasks in research studies
4. Includes a homophone choice task, such as, “Which is a flower, *rose* or *rows*?”
5. Has Signs and Symbols subtest

# Spelling Tests

1. Pay attention to irregular words
2. Is the spelling mainly phonetic
3. If irregular words are worse, points to an orthographic processing weakness
4. Spelling nonsense words (WJ IV) requires precise spelling (only one option is correct)

# Word Identification Tests

1. These are sight word tests, regular, irregular, and nonsense words
2. Ideally should be timed to reduce reliance on phonetic decoding
3. If the student has the sight word in orthographic memory, the word will be consistently pronounced correctly, instantly, and effortlessly without needing context

# Feifer Assessment of Reading (FAR)

## Phonological Index

Phonemic Awareness

Nonsense Word Decoding

Isolated Word Reading Fluency

Oral Reading Fluency

Positioning Sounds

# FAR

Fluency Index (this is mostly an orthographic factor)

Rapid Automatic Naming

Verbal Fluency

Visual Perception

Irregular Word Reading Fluency

Orthographical Processing

# FAR

Comprehension Index

Semantic Concepts

Word Recall

Print Knowledge

Morphological Processing

Silent Reading Fluency: Comprehension



# The READ (Reynolds Early Assessment of Reading)

1. An early dyslexia screener
2. Ages 4-8
3. Computer-assisted administration
4. This scale is being standardized
5. Will be available in early 2021
6. Published by Schoolhouse Educational Services

# READ Subtests

1. Print Conventions
2. RAN: Letter Naming
3. Semantic Sequential Recall
4. Orthographical Processing
5. Basic Language Concepts
6. Letter Recognition
7. Word Recognition
8. Phonemic Awareness: Elision
9. Phonemic Awareness: Blending

# Reynolds Dyslexia Risk Questionnaire (RDRQ)

1. A rating scale
2. Ideal for universal screening
3. Forms for ages 4-5 and 6-7
4. Both parent and teacher forms
5. Forms have 45-60 items
6. Can complete in less than 10 minutes
7. Helpful with young children who are not very testable

# Case Study I

1. Grade 5; beginning 1<sup>st</sup> grade reading level
2. Average intelligence with mid-average vocabulary and above average visual-spatial
3. Also has Autism
4. Spelling is extremely low – 0.1 percentile
5. Painfully sounds out each word even those that should be simple sight words (phonics training has been emphasized with him)

# Case Study PPA Results

- Orthographic processing deficit supports dyslexia diagnosis when matched with Basic Reading Skills score of 56
- See PPA results [table](#)

# Case Study I Recommendations for Orthographic Processing Weakness

1. Place emphasis on phonics instruction
2. When teaching basic sight words, discourage him from trying to sound out the word. Rather, encourage him to look at the whole word and try to recognize it as a whole.
3. Do more rehearsal/repetitions of whole words as they are read, especially when a correction was needed
4. Practice word families, such as all the words that end with “ack”
5. More reading experience

# Case Study II

1. Middle of 2<sup>nd</sup> Grade
2. New words do not stick
3. Difficulty recognizing some letters and their sounds
4. Father had dyslexia
5. Average GIA on WJ IV
6. Average Oral Language on WJ IV
7. Spelling on WJ IV at 8<sup>th</sup> percentile
8. Basic Reading Skills at 9<sup>th</sup> percentile
  1. Letter-Word – 75
  2. Word Attack – 87
9. Poor response to reading interventions

# Case Study II PPA Results



# Case Study II: Phonological Processing

- WJ IV Phonetic Decoding – 98 (consists of Segmenting and Blending)
- Phonological Processing – 85
  - Low due to poor recall of words that begin with a particular phoneme

# Case Study II FAR Results

Isolated Word Reading Fluency	62
Positioning Sounds	84
Visual Perception	88
Irregular Word Reading Fluency	73
Orthographical Processing	91

# Case Study II: FAR Isolated Word Reading Fluency - 62

- This is a phonological subtest with phonetically regular words

# Case Study II: FAR Irregular Word Reading Fluency - 73

Examples:

Eyes

Onion

Calm

Doubt

Cough

Aisle

# General Assessment Strategies and Recommendations

1. Listen to the child read, at least informally
2. Consider risk factors
3. Consider other disorders, ADHD, Autism, etc.
4. Rule out ELL and exclusionary factors
5. If does not meet new dyslexia criteria, may still meet reading disability criteria

# Sharing Results with Parents

1. Deal with the myth that it's all about seeing letters and words backwards
2. Discuss the brain basis & processing weaknesses
3. Include strengths
4. Emphasize the need for intensive early interventions
5. Discuss interventions which lack evidence-base, such as colored transparencies