

Dyslexia

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Three Objectives for Today

- Help you better answer 3 questions:
 - 1. What is dyslexia? Goal is to help you become most knowledgeable person in your school and community about dyslexia.
 - 2. What is reading-related phonological processing? And how is it related to dyslexia?

Three Objectives for Today

- Help you better answer 3 questions:
 - 3. What should be assessed if dyslexia is suspected? And how should you integrate assessment results?

What is Dyslexia?

Dyslexia is a Latent Condition

- Latent means you can't observe it directly.
 - All we can do is infer its presence by its effect on things we can observe.

What's the Story about Reversals?

- Yes, children in 2nd grade with reading problems make reversal errors.
- But so do reading-age matched younger normal readers!
 - Reversals are routine in K and 1st grade.

What's the Story about Reversals?

- Children in 2nd grade with reading problems are reading at an early 1st-grade level, making routine 1st-grade errors.
- They just stand out because their peers are no longer making them.

Summary About Reversals

- An easy error for all of us to make.
- Reasons why reversal errors are easy to make in reading are known (VWFA, visual similarity, same category of letter, item vs. order information).

Summary About Reversals

- Individuals with dyslexia do not make more reversal errors than do reading-matched younger readers.
 - A 2nd grade student with dyslexia makes reversal errors because reading is at beginning 1st-grade.
- They stand out because their age-matched peers make fewer reversal errors.

Three Compelling Studies

- 1. Give normal readers difficult material to read—material that is so hard they read the text comparable to how a child with dyslexia reads grade-level material.
 - Their eye-movements look as jumpy and hesitant as the eye-movements of individuals with dyslexia!

Three Compelling Studies

- 2. Give individuals with dyslexia easy material they actually can read.
 - Their eye-movements look like those of normal readers!

Three Compelling Studies

- The effects of eye-movement training programs.
 - Can train the ballistic saccades, so visual pursuit is trained. Results?
 - Visual pursuit can be improved with training, but training **doesn't generalize to actual reading.**

What Should we Conclude about Role of Eye Movements in Dyslexia?

- Faulty eye movements not the cause of poor reading but a by-product of it!

Conclusions

- 1. Reversal errors are not a cause or hallmark characteristic of dyslexia.
- 2. Faulty eye-movements are not a common cause of dyslexia.
- 3. Dyslexia is a language problem not a visual problem. Language problem resides in the phonological system.

Conclusions

- 4. Dyslexia runs in families.
- 5. Children and adults with dyslexia may have other problems (e.g., ADHD).
- 6. Dyslexia occurs in boys and girls, but is about twice as common in boys.
- 7. Dyslexia is universal.

What is Reading-Related Phonological Processing?

And how is it related to dyslexia?

Three Kinds of Phonological Processing Important for Reading

- Wagner and Torgeson (Psychological Bulletin, 1987) recognized that 3 independent areas of research on speech-sound tasks actually were related, and coined the term reading-related phonological processing.

Three Kinds of Phonological Processing Important for Reading

- Phonological Awareness
- Phonological Memory
- Phonological Access to Long-Term Memory
(Rapid Naming)

Phonological Awareness Plays Causal Role in Learning to Read

- To a child who can hear similarities and differences among “cat,” “rat,” and “hat,” their spellings (cat, rat, hat) are sensible.
- Impaired phonological awareness is a common characteristic of individuals with dyslexia.

Phonological Awareness can be Taught and Trained

- Every major reading series now includes lessons on phonological awareness.
- Training phonological awareness early can prevent or at least mitigate the severity of later word-level reading problems.
 - Early identification is critical to prevention.

Measuring Phonological Awareness

- Common measures of phonological awareness include elision, segmenting, blending, sound matching, sound isolation, and phoneme reversal.

Measuring Phonological Memory

- Digit Span
 - Best with rapid presentation of digits (e.g, 2 per second).
 - Minimizes rehearsal strategies and maximizes dependence on phonological processing.

Measuring Phonological Memory

- Nonword Repetition
 - Works best with “nonword-like” nonwords.
 - “tobraj” is better than “vellow.”
 - Has been used with children as young as 2 or 3 by having a puppet game with the puppets or dolls having nonword names.
 - “Put srismuz on the horse.”

Some Facts About Phonological Memory

- Tasks are simple cognitively compared to phonological awareness tasks.
- Before children learn to read, the correlation between phonological memory and phonological awareness approaches 1.0!

Measuring Phonological Recoding for Lexical Access

- Rapid Naming Task
 - Items to be named can be colors, objects, digits, or letters.
 - It matters.
 - Task can be latency to name a single object using a voice key or serial naming.
 - Serial correlates more with reading.

Limitations of Rapid Naming Tasks

- Complex—difficult to identify source of poor performance.
- Highly similar to reading, especially for naming letters and digits.
 - Is poor reader RAN performance poor simply because it also is a decoding task?

Learning Objective 3: What Should be Assessed if Dyslexia is Suspected?

And How Should You Integrate
Assessment Results?

Best Practices

- Rely on evaluation of multiple sources of information—no single criterion will be reliable or valid.
- What should be your targets of evaluation and assessment?

Relative to Oral Language Proficiency

- 1. poor nonword decoding.
- 2. limited sight-word vocabulary.
- 3. impaired phonological processing
- 4. poor response to instruction/intervention.
- 5. poor spelling and writing.

Other Characteristics

- 6. family history of reading problems.
- 7. listening comprehension better than reading comprehension.
- 8. co-occurring inattention common.
- 9. co-occurring math disability common.

Other Characteristics

- 10. found in boys and girls, although boys are twice as likely to have relatively severe problem.

Bayesian Approach

- Use a Bayesian approach by beginning with prevalence and updating probability as you consider information.

Summary

What is Dyslexia?

- Dyslexia is caused by a language problem not a visual problem. Language problem resides in the phonological system.
- Dyslexia is a latent condition but has identifiable observable characteristics that were described.

What is Reading-Related Phonological Processing?

And How is it Related to Dyslexia?

Three Kinds of Phonological Processing Important for Reading

- Phonological Awareness
- Phonological Memory
- Phonological Access to Long-Term Memory
(Rapid Naming)

Three Kinds of Phonological Processing Important for Reading

- They play a causal role in the development of dyslexia.

What Should be Assessed if Dyslexia is Suspected?

And How Should You Integrate
Assessment Results?

- The targets of assessment are the observable characteristics that were described.
- It is important to consider multiple characteristics—no single criterion has adequate reliability and validity.
- A Bayesian approach is useful for combining information.