Understanding Dyslexia: Myths and Realities of Assessment and Instruction

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DUBARD HONORARY LECTURE, 2014

Myths We Have Already Dispelled

- Dyslexia means “seeing things backwards”
- Dyslexia requires vision therapy
- Dyslexia is far more common in boys than girls
- Dyslexia is associated with left-handedness

Your Turn: True or False?

- Einstein was dyslexic.
- Dyslexia is associated with cognitive gifts.
- Low performance on phonological tasks (oral language) is the cornerstone of a diagnosis of dyslexia.
- There are at least several types of dyslexia.
- The syndrome of dyslexia is very distinct from other language-based learning disorders.

“Reading builds on language…” (Perfetti, 2011)

The Many Strands that are Woven into Skilled Reading (Scarborough, 2001)

How We Read and Spell Words
The Reading Brain

How We Recognize Words

Units of Analysis

unreachable  word
un-reach-able  morpheme
un-reach-a-ble  syllable
u-n-r-ea-ch-a-b-le  grapheme
u-n-r-e-a-c-h-a-b-l-e  letter

Dyslexia: Definition (2003)

- One of several distinct reading difficulties
- Characterized by...
  - Poor decoding and encoding (spelling)
  - Unusual problems with accurate and/or fluent printed word recognition
  - Inconsistent with age and/or cognitive ability
  - Often associated with difficulty identifying, manipulating, and/or producing the speech sounds in spoken words (phonology)

A Common Conceptualization of Dyslexia...

A Newer Conceptualization: “Multiple Dyslexias” (Fletcher et al., 2007; Aaron, Joshi et al., 2008; Elliott & Grigorenko, 2014)...
Is Dyslexia Associated with Giftedness?

- Claims of visual, artistic, and entrepreneurial superiority are common
- Reality: reading, in the early stages, has a low correlation with intelligence, especially non-verbal intelligence
- Reading and many aspects of intelligence are independent

The “Einstein” Syndrome?

- He was slow in learning how to talk...Whenever he had something to say, he would try it out on himself, whispering it softly until it sounded good enough to pronounce aloud...He had such difficulty with language that those around him feared he would never learn...Throughout his life, Einstein had a mild form of echolalia, causing him to repeat phrases to himself, especially if they amused him.
- ...a cheeky rebelliousness toward authority
- ...he generally preferred to think in pictures, most notably in famous thought experiments
- ...in primary school, he was at the top of his class...

People with LD Can Have Disparate Talents

- Pablo Picasso (visual-spatial imagination)
- Winston Churchill (oration)
- Agatha Christie (literary/narrative imagination)
- Philip Schultz (poetry)
- Greg Louganis (sense of body position in space)
- Jim Dutcher (wildlife photographer)
- Simon Pierce (glass blower/designer)
- Whoopi Goldberg (actress, comedienne)

IQ Discrepancy Has Little to Do with Specific Reading Disability

Discrepant and Non-Discrepant Have Similar Outcomes Over Time (Francis et al., 1996)

Aim of Assessment!

- Who needs help?
- Why do they need help?
- What kind of help do they need?
- Is the help helping?
- If not, why not? Should I change something?
Five Questions to Answer

1. Has any immediate relative experienced similar difficulty learning to read, spell, or write?
2. What have the parents observed about their child’s early language development and early interaction with print and books?
3. Have hearing, vision, and general health been checked? Is there any medical reason why there might be a learning impairment?
4. What did the student experience in the way of prior instruction, and how was that documented?
5. (If student is older) – Are the reported difficulties chronic? Is there evidence in the school record that they have been there all along?

Most Important Skills to Assess and Interpret

- Nonword reading and spelling
- Phonological awareness
- Reading accuracy, out of context
- Reading fluency and rate
- Spelling (regular and irregular words)
- Math and oral language abilities, for comparison

Case Study #1, SD

- Repeated kindergarten – “progressing normally”
- First grade teacher “expressed concerns that he was falling behind”
- Second grade teacher referred him to Title 1 remedial reading program; observed difficulty with phonics, speech sound discrimination, and verbal comprehension
- Parents sought private evaluation in summer before 3rd grade

SD’s Behavior During Academic Tests

- Very slow processing speed on verbal or symbolic tasks; yawned and tuned out.
- No spontaneous conversation; didn’t initiate.
- Needed high rate of reinforcement to persist and much encouragement to respond to tasks.
- Gave truncated responses to verbal questions; often was unable to elaborate. Like “pulling molasses.”
- Deliberate, methodical; attentive when a motor (hands-on) component was present.

SD’s Reading Evaluation - WRMT

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Standard Score</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Identification</td>
<td>73</td>
<td>4</td>
</tr>
<tr>
<td>Word Attack</td>
<td>71</td>
<td>3</td>
</tr>
<tr>
<td>Word Comp</td>
<td>78</td>
<td>7</td>
</tr>
<tr>
<td>Passage Comp</td>
<td>72</td>
<td>3</td>
</tr>
<tr>
<td>Composite</td>
<td>72</td>
<td>3</td>
</tr>
</tbody>
</table>

Verbal IQ 80
Performance IQ 105 (117)
Speech/Language Evaluation
Not low enough to qualify as “language disordered” but scored at about the 10th %ile on the CELF.
Strengths: Labeling pictures; repeating sentences verbatim.
Pronounced weakness in ability to:
  Explain word meanings; recognize multiple meanings of words; comprehend spatial and temporal word classes and categories; and formulate complete sentences with conjunctions.
  Doesn’t know months of the year or calendar concepts.

Spelling Errors (TWS, 8th %ile)
- Confusion of short vowels a, e (lat/let; nast/next; spand/spend; myself/myself; areonn/everyone)
- Omission of nasals before consonants (whet/went; ucul/uncle; ninht/nineteen)
- Omission of /r/ in “storm”
- Confusion of /s/ and /ch/ (mues/much)
- C-ie syllable (ucul/uncle; pepule/people)

Questions: Case Study #1, SD
- What is the nature and severity of this student’s problem?
  “Mixed” or “triple deficit” reading disability.
- Why wasn’t it identified sooner?
  No universal screening; no behavioral problems.
- Who should be responsible for teaching a student like this?
  Everyone, all day every day.

What Components of Instruction Should Be Emphasized for SD?
- phonological awareness
- phoneme-grapheme mapping (encoding)
- accurate blending and word reading (decoding)
- vocabulary: multiple meanings, elaborated definitions, spatial and temporal words; categorization; inflectional morphemes
- sentence elaboration and formulation
- verbal reasoning and expressive skills

Phoneme Identification
Link the phoneme to a gesture, object, or picture of the word.
- Call attention to articulation.
- Identify the sound in spoken words.
- Cue the production of the sound with the gesture, object, or picture.

Consonant Phonemes by Place and Manner of Articulation

<table>
<thead>
<tr>
<th>Place of Articulation</th>
<th>Manner of Articulation</th>
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<tbody>
<tr>
<td>stops</td>
<td>unvoiced</td>
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<tr>
<td></td>
<td>/p/</td>
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<tr>
<td></td>
<td>/b/</td>
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<td>/k/</td>
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<td>/g/</td>
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<td>unvoiced</td>
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<td>/ʒ/</td>
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<td>affricates</td>
<td>unvoiced</td>
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<td>/ch/</td>
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<td>/ʃ/</td>
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<td>glides</td>
<td>unvoiced</td>
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<td>/ʃ/</td>
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<td></td>
<td>/h/</td>
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<tr>
<td>liquids</td>
<td>/l/</td>
</tr>
<tr>
<td></td>
<td>/r/</td>
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</tbody>
</table>
### English Vowel Phonemes by Order of Articulation

Vowel sounds that are close to each other are easily confused.


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### Why Does Phoneme Awareness Predict Reading and Spelling?

“Children faced with the task of learning to read in an alphabetic script cannot be assumed to understand that letters represent phonemes because awareness of the phoneme as a linguistic object is not part of their easily accessible mental calculus, and because its existence is obscured by the physical properties of the speech stream.” (A. Liberman, 1989)

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### Phoneme-Grapheme Mapping

<table>
<thead>
<tr>
<th>Anglo-Saxon</th>
<th>Sound-Symbol</th>
<th>Syllable Patterns</th>
<th>Morpheme Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consonants</td>
<td>single, digraphs, trigraphs, blends</td>
<td>closed open</td>
<td>compounds inflections base words suffixes high frequency words</td>
</tr>
<tr>
<td>Vowels</td>
<td>short, long, +e, -e, vowel team, vowel+r patterns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latín</td>
<td>prefixes roots suffixes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greek</td>
<td>ph for /f/ (graph) ch for /k/ (chorus) y for /i/ (gym)</td>
<td></td>
<td>Combining forms plurals</td>
</tr>
</tbody>
</table>

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### Vocabulary Learning is Influenced by Phonology

- Ability to repeat, remember, and recall new words depends on naming them correctly:
  - zydeco, chimera, chzech, segue, synapse, dialogic
- Similar words must be distinguished:
  - anecdote, anticipate, prune, prude
  - departed, deported, tenant, tenet
Sentence Sense, Grammar & Syntax

- exposure to “literary” syntax
- sentence coding and diagramming
- multisensory grammar
- sentence combining
- sentence anagrams
- sentence elaboration

Relationship Between Fluency and Comprehension Changes Over Time

Proportion of variance in FCAT explained by oral reading fluency and verbal comprehension (Schatschneider et al., 2004)

Comprehension

Surface Code

WM

Text Base

Goal: Mental Model

Reading Comprehension Depends on Active Processing of...

- figurative language
- multiple meanings
- academic language formalities
- discourse structure
- phrase structure in sentences
- topic-specific terminology

Reading Comprehension

Case Study #2, 2nd Grader

Dear Dr. Moats,

When I read, I want to sound! When I read in my head, I get a head ache. Sometimes when I get my spelling test back in my folder, I cry because I must do so many words in math and science, and that I love and do good at. My brain thing to do is having a quiet time.

Case Study Results:

- WISC Vocabulary: 98th percentile
- Full Scale IQ: 90th percentile
- Listening Comp: 98th percentile
- WJ-III Word Reading: 16th percentile
- Gray Oral Rate & Accuracy: 16th percentile
- OTW-III (Reading Comp): 20th percentile
- Woodcock RMT Word ID: 16th percentile
- Spelling (WJ-IV): 12th percentile

Is accurate at decoding elements (untimed).
Do All Dyslexics Have Phonological Deficits?

Franck Ramus (cited in Dehaene, 2009)

- “A core deficit in phonological processing lies at the origin of most dyslexia.” but “about one in four presents a pronounced visual [orthographic] deficit and no phonological impairment.” (p. 242)
- “The problem that faces us is complex and does not have a single well-defined cause.” “A joint deficit of vision and language.”

More Complex Conceptualization of Reading Disabilities (Fletcher et al., 2007; Aaron, Joshi et al., 2008)

Adjustment for Poor Orthographic Memory

- Teach the logic of English spelling, emphasizing patterns, word origin, and morphology
- Practice “sight word” memory for highest frequency words
- Constantly review and reteach as needed
- Call attention to details of print through word sorting, computer games, spelling aloud, color coding – anything that works.

Part 2 – The Consequences of Misinformation and Misunderstanding about Reading, Language, and Writing Instruction

Unsupported Conceptual Models

For example, using configuration in word ID:

Graphophonic/Visual
Semantic
Syntactic

“The Three Cueing Systems”
Word Recognition Depends On Phoneme-Grapheme Mapping

The “alphabetic word wall.”

“Making Words” (Not Systematic!)

Unfortunate consequences, continued...

Misuse of context for word recognition...

Misuse of context in instruction...

O
one
once
only
out
open
on
off

E
eye
eat
end
every
even

i, u, k, m, n, p, p
up, in, ink/kin, pin, pun, pup,
pump, pink, mink, pumpkin

a, i, b, b, r, s, t
at, sat, rat, bat, bar, tar,
star, stir, stair, rabbits

“Phoneme awareness” instruction that doesn’t focus on phonemes
- syllable counting
- rhyming
- matching a first sound
- Phoneme awareness that isn’t directly assessed
- “running records”

Context does not drive word recognition.
Context is useful for deciphering the meanings of unknown words, once they are named or recognized.
(Perfetti, 2011)

“….Don’t know that word? Well just keep reading and see what might make sense here…”
Part 3 – What is research-supported best practice?

Structured Literacy
- Linguistic concepts
- Systematic
- Explicit
- Cumulative
- Multisensory
- Intensive
- Applied to purposeful reading and writing

Implications of Current Research (Elliott & Grigorenko, 2014)
- Traditional “O-G” is not the only approach
- Teachers need preparation in all aspects of oral and written language
- Curriculum should include direct teaching of all strands of language PLUS accommodations, technology supports, and compensatory strategies
- Student’s strengths must be developed

Many “Structured Literacy” Therapies and Approaches
- DuBard Association Method
- Lindamood-Bell – LIPS and VV
- REWARDS
- Direct Instruction (e.g., Reading Mastery; ReadWell; SFA)
- Wolf’s RAVE-O; Lovett’s PHAST
- Hochman’s Teaching Basic Writing Skills
- LANGUAGE! Curriculum

A Multi-component Lesson Framework
- “Sound warm-up” – phoneme awareness
- Direct, explicit teaching of word or language concept (phonics, etc.)
  - Modeling
  - Guided practice
  - Supported independent practice
  - Application in context

Multi-component Lesson, continued.
- Fluency development
  - speed drills
  - repeated reading
  - Partner work
- Vocabulary building
- Oral and silent text reading for comprehension, including sentence level work
- Spelling and writing
Reading Should Be Meaningful

- Is the vocabulary rich and evocative?
- Is there thematic depth?
- Are major genres well sampled?
- Are the ideas engaging and worth knowing about?
- Is the text worth rereading?

Adapt for the Learner!

In Summary – Some Realities

- Learning to read is complex; there is no single cause for dyslexia and related reading disabilities
- Most students need a multi-component approach
- Assess and treat the problem directly; use “processing” tests to help explain the student, but not as a gateway to services
- Rely on structured literacy and language approaches for intervention
- Look for and develop compensatory student strengths

Remember

“Every child would read [and spell] if it were in his power to do so.”


“lt Changed My Life!”

You, the teacher, are the most important agent for that change.

Thank you for the work you do!

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# References


