Dyslexia and Morphologically-Complex Words
Elaine Cheesman, Ph.D.

It matters little what else they learn in elementary school if they do not learn to read at grade level.


Dyslexia

c. 1887, from German dyslexie (1883)

from Greek dys- "abnormal, difficult" + lexis "word," from legein "speak."

Dyslexic (n.) is first recorded 1961.

Definition

International Dyslexia Association and NICHD (2002)

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 and reduced reading experience that can impede growth of vocabulary and background knowledge.

Neurobiological Basis

Eden et al., Neuron, 2004
I learned to ride a bike. And I am dyslexic and I hate it. I got to learned one and I got it (dyslexia) from one of my parents but my parents both do not have dyslexia.

"I was one of the 'puzzle children' myself — a dyslexic . . . And I still have a hard time reading today. "

- Nelson Rockefeller

"I, myself, was always recognized . . . as the "slow one" in the family. It was quite true, and I knew it and accepted it. Writing and spelling were always terribly difficult for me. My letters were without originality. I was . . . an extraordinarily bad speller and have remained so until this day."

- Agatha Christie
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Speech

Not Linked to Intelligence

IQ is linked to the level of ability to read in the neurotypical individual, but is not linked to the level of ability to read in the individual with dyslexia.

Shaywitz, et. al. (2010)
“A teacher sent the following note home with a six-year-old boy: “He is too stupid to learn.” That boy was Thomas A. Edison.”
- Thomas Edison

I was called lazy. I was called stupid. I was told I was not living up to my potential. And all the time inside I’m thinking, I don’t think I’m stupid. I don’t want to be stupid. I’m trying as hard as I can. I really am.
- Henry Winkler (actor)

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“If you read to me I could tell you everything that was read. They didn’t know what it was. They knew I wasn’t lazy, but what was it?”
- Whoopi Goldberg

“I never read in school. I got really bad grades—D’s and F’s and C’s in some classes, and A’s and B’s in other classes. In the second week of the 11th grade, I just quit. When I was in school, it was really difficult. Almost everything I learned, I had to learn by listening. My report cards always said that I was not living up to my potential.”
- Cher
THE 4TH GRADE “SLUMP”

Anglo-Saxon Compound Words

Base Word
- book
- sign

Base Word
- case
- post

Bi-Morphemic

Prefix
- re

Base / Root
- sign

Suffix
- ed
Developmental Stages

Grades 1 – 3
- Mono and bi-morphemic words
- Inflectional endings
- Common Derivational Suffixes
  -ful, -less, -ness, -ful, -ly

Grades 4 +
- Multi-morphemic words
- Derivational suffixes, Latin roots, Greek combining forms.
- Associated with rapid vocabulary growth

Morphemes and Reading
- Significantly related to word reading achievement.

1st grade: \( r = .46 \)
  - (Carlisle & Nomikos, 2001)

3rd – 8th grade: \( r = .50 \)
  - Singson, Mahony, & Mann...
Morphemes and Reading

• By age ten, awareness of morphemes is a better predictor of decoding ability than phonemic awareness. - Singson, Mahony, & Mann 2000

never anything more than that to suggest that all was not well in the quarters. Yet when morning came, they invariably discovered that a group of the finest slaves had taken to their heels.

Morphemes and Spelling

Good spellers of all ages use their knowledge of word origin and morphemic structure of words better than poor spellers.

School uniforms are if you give me one, I’d and give you the …


Morphemes and Spelling

• Awareness of morphemes is a significant predictor of spelling success - making visual or phonological connections were not significant predictors. - Devonshire & Rush (2010)

fraction

sailor
distance
conduction
discovery
resident
visible
Derivational Suffixes

- Teach after inflectional suffixes: -ed, -s, -ing, -er, -est
  - Patient + -s → more than one

- Marks or changes the part of speech of a word:
  - Patient + -ence → quality of being (noun)

Literate adult error:
"Patients was never one of my virtues."

Verb → Noun
- inject → injection
- type → typist
MORPHOLOGICALLY COMPLEX WORDS

Shift Words

Progressively more difficult (Carlisle, 1988)

1. No Change
2. Orthographic (spelling) Change
3. Phonological (sound) Change
4. Both Change
1. No Change

Enjoy + ment  enjoyment
Six + ty  sixty
Help + ful  helpful

2. Orthographic Change
(Spelling Rules)

Double  hop + ing  hopping
Drop  judge + es  judges
Change  beauty + ful  beautiful

3. Phonological Changes

- Silent / sounded  bomb – bombard
- Consonant  public – publicity
- Vowel  heal – health
- Combination  sign - signal
4. Both Change

<table>
<thead>
<tr>
<th>Base word</th>
<th>Suffix</th>
<th>Derived form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep</td>
<td>-th</td>
<td>depth</td>
</tr>
<tr>
<td>Five</td>
<td>-ty</td>
<td></td>
</tr>
<tr>
<td>Divide</td>
<td>-ion</td>
<td></td>
</tr>
</tbody>
</table>

“Non-neutral” Derivational Suffixes

Derivational suffixes that cause changes to the base word.

-ic          magnet   magnetic
-al          nāture   nātural
-ity         nātive   nātivity
-ous         stūdy    stūdious
-ive         derive   derivative
-ion         pronounce pronunciation

Grades 4 and higher
INSTRUCTION
Improves with Instruction

Direct, explicit instruction in morphology significantly increases decoding and spelling skills among students in elementary, middle, and high school.

Devonshire & Fluck, 2010; Nunes & Bryant, (2006); Kirk & Gillon, 2009; Reed, 2008.

Structured Word Inquiry

Higher Order Thinking Skills (HOTS)

• Present / respond to interesting spelling inquiry.
• Present a set of words that make the relevant pattern more salient.
• Practice the identified pattern with appropriate tools.

Bowers, P.N. & Kirby, J.R. (2010)

Integrate Instruction

1. Tell your students about the types of changes
   – no change
   – sound,
   – spelling,
   – both)
2. Teach related words simultaneously
3. Teach in multiple ways
Begin with Oral Vocabulary

“I’ll say a word, and a sentence with that word. Then I’ll start a sentence that needs a new form of the word. You tell me the new form.”

**Sign.** I sign my name. If I write in cursive, it is my [students complete orally] ____________.

**Sign.** A sign shows information. I stop at a traffic [students compete orally] ____________.

Morphological Matrix

<table>
<thead>
<tr>
<th></th>
<th>re</th>
<th>de</th>
<th>sign</th>
<th>ing</th>
<th>ed</th>
<th>fly</th>
<th>ate</th>
<th>ion</th>
<th>use</th>
</tr>
</thead>
</table>

1. signal sign + al
2. signing sign + ing
3. signify sign + ify
4. resigned re + sign + ed
5. resigning re + sign + ing
6. redesigning re + de + sign + ing
7. designate de + sign + ate
8. designation de + sign + ate + ion
9. signature sign + ate + ure

Oral & Written Vocabulary

“I’ll say a word, and a sentence with that word. Then I’ll start a sentence that needs a new form of the word. You tell me the new form.”

**Sign.** He left his job. He ____________.

**Sign.** The form required a ____________.

*Morphological map may or may not be visible to the student.*
Practice Similar Patterns Together

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<tr>
<th>Derived Form</th>
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<th>Suffix</th>
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<tbody>
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<td>public</td>
<td>ity</td>
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<td>elasticity</td>
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</tr>
<tr>
<td>electricity</td>
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<td>ity</td>
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Add One or Two New Patterns

<table>
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<th>Suffix</th>
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<td>ion</td>
</tr>
<tr>
<td>revision</td>
<td>revise</td>
<td>ion</td>
</tr>
</tbody>
</table>

Spelling

Teacher: “signal”  
Student: “signal”  Base “sign” suffix “a – l” (name the letters)

1. 
2. 
3. 
4. 
5.
Spelling Strategy

Think of related word to reveal vowel spellings.

- sign - resignation
- sign - signal

Read and Dictate Sentences

Magnetizing steel can be fun, and it’s a great way to teach children about magnets, magnetization and the earth’s magnetic field. So, if you want a simple teaching project to create simple magnets and teach about the North and South magnetic poles and compasses, try one or both projects to magnetize steel.

Thank you!

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