Morphology in reading: Binding letters, sounds, and meaning

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Thank you to...

<table>
<thead>
<tr>
<th>Education</th>
<th>Queen’s</th>
<th>Sources of Funding</th>
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<tbody>
<tr>
<td>Peter Bowers</td>
<td>Liying Cheng</td>
<td>Social Sciences and Humanities Research Council</td>
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<td>April Clausen</td>
<td>Don Klinger</td>
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<td>Miao Li</td>
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<td>Jeff MacCormack</td>
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<td>Xiuli Tong (Hong Kong)</td>
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1. Morphology is important for reading
   • There are 7 good reasons (at least)
   • But it is rarely taught (Nunes & Bryant, 2006)

2. Morphology works because it helps integrate (bind) letters, sounds, and meaning

Morphology describes how words are composed of **morphemes**, the smallest units of meaning

Prefix + Base + Suffix

Examples:
- walked = walk + ed (an inflection)
- design = de + sign (a derivation)
- deadline = dead + line (a compound)

But first, a bit about reading ....
Why study reading?

- Our species’ greatest cultural invention?
- Required for success
- Source of enjoyment and learning
- An interesting phenomenon to investigate

Many challenges

- Relation to socioeconomic status
- Many children struggle, especially in English
  - An opaque, not transparent orthography
- How should it be taught?
  - Phonics, whole word, whole language?
Reading – the big picture

Morphology

- Letter knowledge
- Phonological awareness
- Naming speed

Vocabulary

Oral Language Comprehension
- Inference
- Monitoring
- Working memory

Word Reading

Reading Comprehension

The GRAIL
- Purpose of learning
- Conceptions of learning
- Executive functions

Generative Reading And Integrated Learning
What is reading?

- **Semantics** (meaning)
- **Orthography** (spelling, letters)
- **Phonology** (sounds)
How to teach reading?
Where is morphology?

Morphology binds semantics, orthography, and phonology

Whole Language Instruction

Semantics

Morphology

Orthography

Phonology

Whole Word Instruction

Phonics Instruction
7 reasons to teach morphology

1. English is fundamentally Morpho-phonemic

English orthography “is not merely a letter-to-sound system riddled with imperfections, but instead, a more complex and more regular relationship wherein phoneme and morpheme share leading roles” (Venezky, 1967, p. 77)
2. We already process morphology, automatically and unconsciously

- Evidence from *priming* studies (e.g., Hassan-Yari, Kirby, & Deacon, 2011)
- Shown different words
  - Identity: harm
  - Inflected: harmed
  - Derived: harmful
  - Ortho control: harmony

- Asked to complete h a __

Teaching children to do it explicitly and consciously may help
3. Morphological knowledge predicts reading ability

After controlling verbal and nonverbal IQ, and phonological awareness (Kirby, et al., 2012)

Other studies show the same, with other predictors controlled, in many languages, e.g., Arabic (Tibi & Kirby, 2014), French (Kirby, Desrochers, & Thompson, 2010)
4. Poor Morphological Awareness characterizes poor comprehenders

- Grade 5 poor comprehenders performed worse on morphology tasks (derivation) than average readers (Tong, Deacon, Kirby, Cain, & Parrila, 2011)

- In Chinese ESL students, poor and average comprehenders performed worse in morphology than good comprehenders (Li & Kirby, 2014)

- “poor comprehenders” are students with adequate word reading ability but poor reading comprehension
5. Morphological instruction improves reading

Meta-analyses (e.g., Bowers, Kirby & Deacon, 2010) have shown that morphological instruction (compared to regular class instruction)

• Improves reading, spelling, vocabulary
• Is more effective for younger children
• Is more effective for less able children
• Medium effect sizes

Effect of Morphological Instruction

[Graph showing effect sizes for various aspects of reading, spelling, vocabulary, and children's abilities, with effect sizes categorized as small (0.2), medium (0.5), and large (0.8).]

Effect sizes: .2 = small  
.5 = medium  
.8 = large
6. It’s fun

Word Matrix

<table>
<thead>
<tr>
<th>un</th>
<th>dis</th>
<th>please</th>
<th>ure</th>
<th>able</th>
<th>ing</th>
<th>please/ + ing → pleasing</th>
</tr>
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<tbody>
<tr>
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<td>please/ + ant + ly → pleasantly</td>
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<td>un + please/ + ant + ness → unpleasantness</td>
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<td>please/ + ure/ + able → pleasurable</td>
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<td>dis + please → displease</td>
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Word Sums

- please/ + ing → pleasing
- please/ + ant + ly → pleasantly
- un + please/ + ant + ness → unpleasantness
- please/ + ure/ + able → pleasurable
- dis + please → displease

Testing hypotheses about morphological structure
7. It fits with theory

Binding Agent theory

- explains effect on word reading
- Supports integrated instruction
- Effect on vocabulary and grammar explains comprehension effect
The Message Again:
1. Morphology is important for reading
2. Morphology works because it helps integrate (bind) letters, sounds, and meaning

What’s next?
• Morphology in other languages
  • Arabic – has a nonlinear morphology (with Sana Tibi)
• Morphological instruction for struggling readers (with Jeff MacCormack and Peter Bowers)
  • Build on a relative strength
• Teachers’ knowledge of morphology
• Encourage integrated curriculum development
• ???
Thank You!

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Presentation available at
http://educ.queensu.ca/faculty/profiles/kirby
References

Resources
www.wordworkskingston.com
http://www'affixes.org/
www.neilramsden.co.uk/spelling
www.vocablog-plc.blogspot.com
www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/WW_Morphology.pdf
# Common affixes

<table>
<thead>
<tr>
<th>Prefixes</th>
<th>Vowel suffixes</th>
<th>Consonant suffixes</th>
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<tbody>
<tr>
<td>a-, ad-, al-, be-, bi-, com-, contra-, de-, di-, dia-, dis-, en-, ex-, in-, inter-, intro-, mis-, non-, ob-, para-, per-, pre-, re-, se-, sub-, syn-, tele-, trans-, un-</td>
<td>-ability, -acle, -acy, -al, -ance, -ate, -ed, -eer, -ence, -er, -ery, -ian, -ibility, -icle, -ing, -ion, -ique, -ism, -ity, -ive, -ize, -or, -ory, -ous, -ule, -ure</td>
<td>-cy, -dom, -ful, -hood, -less, -let, -ling, -ly, -ment, -ness, -ry, -s, -ship, -some, -st, -th, -ty, -ware</td>
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