Measures Matter: Reading Comprehension may not be the Best Measure of Reading Ability

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Background

- Most research on individual differences has used reading comprehension as the primary measure of reading ability.
- Recent research suggests spelling skill may be a more precise predictor of reading ability.
- According to the lexical quality hypothesis (LQH), high and low-skill readers are differentiated by the quality of word representations.
  - High quality: accurate spelling, sound, and meaning components and strong connections between them
  - Low quality: absent, inaccurate, or underspecified spelling, sound, and meaning components, and weak connections between them
- During reading, spelling is the primary pathway to activating that word’s meaning
- Measuring spelling skill directly measures the accuracy of the spelling component.
- Reading comprehension may measure a variety of skill (e.g. working memory, inferencing)
- Thus, high-skill spellers are thought to have high-quality spelling representations that will facilitate activation of word meanings

Current Study: The current study investigates differences in total reading time when participants are assessed for both reading comprehension ability and spelling skill

Methods

Participants: One hundred and eight Kent State University students participated in this study for course credit
  - 12 removed for failing to answer comprehension questions with 80% accuracy; 6 removed for track loss
  - 90 participants contributed data

Skill Assessment
- Spelling recall measure
- Nelson-Denny Test of Reading Comprehension

Stimuli
- Materials adopted from Dopkins, Morris, and Rayner (1992)
- Half of the sentences contained strong context

Context: Viciously snarling and growling, the boxer soon barked at the baggage attendant.
Neutral: As we had all expected and feared, the boxer soon barked at the baggage attendant.

Procedure
- Participants read 16 experimental sentences followed by comprehension questions while their eye movements were recorded
- The average comprehension question score was 86%

Results

Analyzed using a Linear Mixed-Effect Model (LMM) using R statistical software (R project, 2013).
- Moderate correlation between spelling and comprehension skill (r=.31, p<.05)
- Greater number of high-skill readers than high-skill spellers
- Main effects of spelling and comprehension skill
  - High-skill readers read more quickly than low-skill readers
  - Replicates previous individual differences research with spelling measure
- High-skill spellers are significantly faster readers than high-skill comprehenders
- Low-skill spellers are significantly faster readers than low-skill comprehenders
- Better model fit for spelling skill than comprehension skill
  - Spelling skill is a better predictor of total reading time than reading comprehension skill

Conclusions

- Spelling is a valid measure of reading ability
  - Replicates previous research in individual differences using a spelling measure
- High-skill comprehenders took longer to access words and to integrate them into the text representation than high-skill spellers
- LQH: High-quality representations and strong connections from spelling to meaning may facilitate reading time in high-skill spellers
- Low-skill comprehenders had longer reading times than low-skill spellers
  - Few participants scored <33% on the comprehension test
- Spelling is a more precise measure of reading ability than reading comprehension

References


Background

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<tr>
<th>Skill Classification Groups</th>
<th>Skill Level</th>
<th>Spelling</th>
<th>Comprehension</th>
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<tbody>
<tr>
<td>Low</td>
<td>27</td>
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<tr>
<td>Average</td>
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<td>High</td>
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Total Reading Time

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<tr>
<th>Time in Milliseconds</th>
<th>Spellers</th>
<th>Readers</th>
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<tr>
<td>Low</td>
<td>6836</td>
<td>5889</td>
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<tr>
<td>High</td>
<td>4285</td>
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Reading Scores x Spelling Scores