

Early Word Reading and Reading Comprehension Development among At-Risk Readers

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Why Early Reading?

5-10% school-aged children are at risk for serious reading problems (Fuchs et al., 2012)

Weak beginning reading skills negatively affect children's enjoyment of reading, their performance in content areas like mathematics and science; and their social adjustment.

It is important to understand how at-risk students' early reading skills (including reading comprehension) develop, and which cognitive and linguistic factors explain this development.

- Such investigation may provide insight into the nature of early reading development;
- Establish links between it and early cognitive/linguistic factors;
- Suggest potentially important components of reading readiness programs.

Prior Research

Simple View of Reading

- Word Reading
- Reading Comprehension

Much research reflects either a concurrent approach or a short longitudinal approach (e.g., two time points), not focus on development trajectories

- Predictors of performance on a specific task (reading comprehension) may vary depending on when the task is administered (e.g., Paris, 2005).
- Specify important (constant and inconstant) predictors of that development

Prior Research

At-Risk Readers

- Catts et al. (2016), Fuchs et al. (2012), and Mancilla-Martinez and Lesaux (2010) investigated whether at-risk readers' early reading skills predicted reading comprehension in later grades.
- Whereas their findings shed light on reading development and its early precursors, none of the research teams addressed the trajectory of reading comprehension among these children.
- Nor did they explore the relative importance of domain-general skills versus domain-specific skills in early word reading and reading comprehension development.

Purpose

Explore the developmental trajectories of word reading and reading comprehension and their predictors among young at-risk readers

Participants

185 at-risk readers identified as such in fall of first grade in 24 elementary schools in a mid-size southern city in the U.S.

- Teacher nomination
- Score in the lower percentile on reading tests
- IQ in the normal range

Measures

In fall of first grade, our study sample was tested on domain-specific measures including letter knowledge, phonological awareness, vocabulary, and domain-general measures including working memory, non-verbal reasoning, and processing speed.

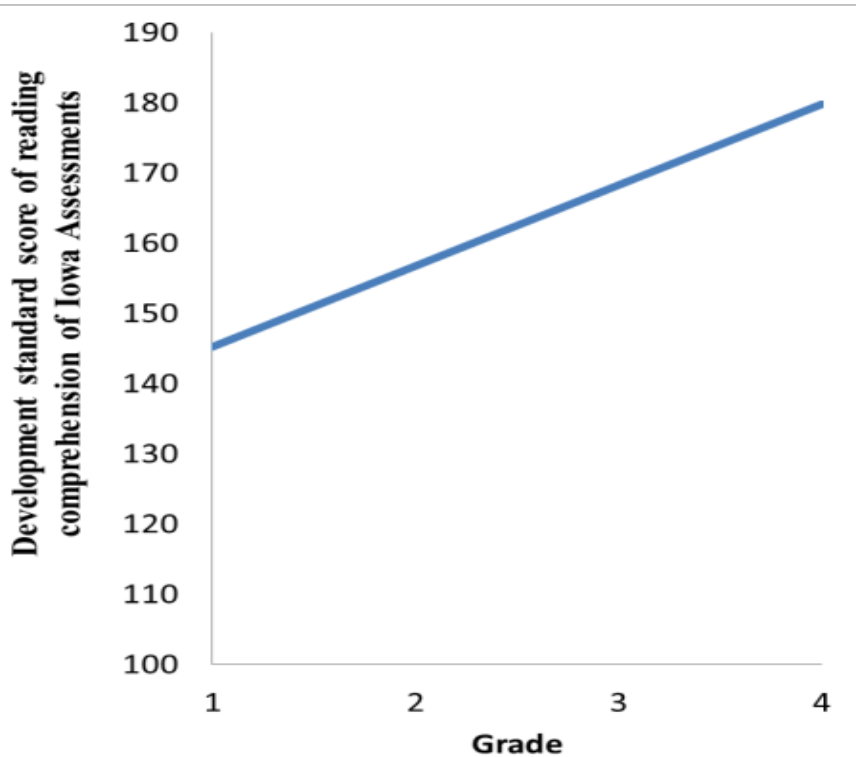
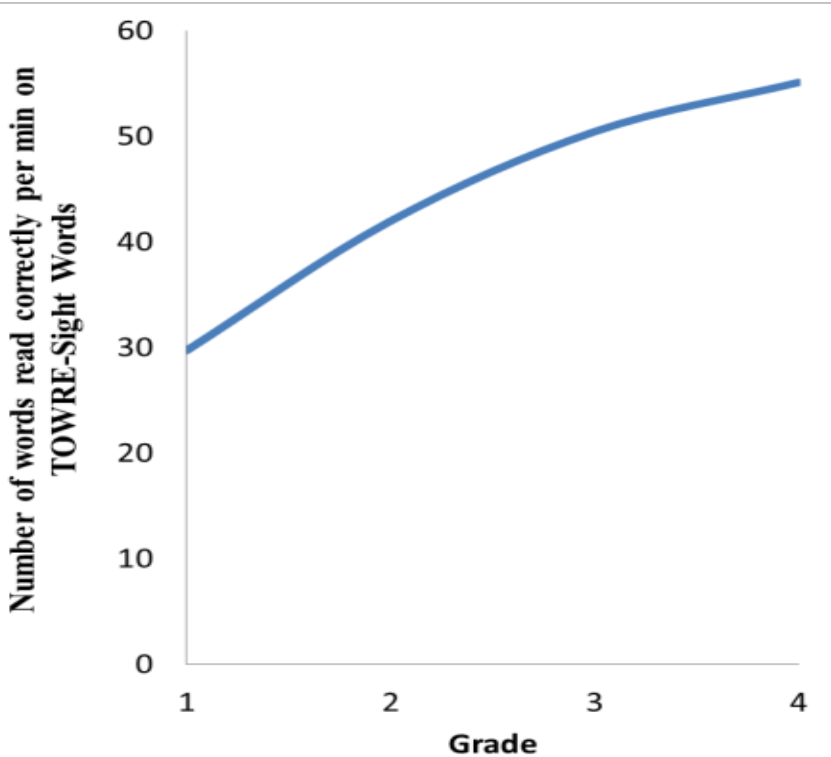
Word reading and reading comprehension were also assessed in fall of first, spring of first, second, third, and fourth grades.

Data Analysis

1. Data missing at random based on Little's MCAR test. Using maximum likelihood estimate approach for the growth models .
2. Unconditional baseline growth models (HLM-7; Raudenbush et al., 2011) for word reading and reading comprehension across four time points; time nested within students, students nested in school. (using deviance statistics to decide the best-fit model).
3. Conditional models, predictors of the intercept, slope, and/or the quadratic term of word reading/reading comprehension

Results

Baseline Model



Results

Word reading performance “plateaus” in the intermediate grades because of ceiling effects?

- The percentiles of our sample’s word reading performance from first through fourth grade: 45.54, 58.33, 43.68, 42.59, and 37.83
- Thus, the nonlinear trajectory we observed was more likely a result of less formal word reading instruction as children moved from the primary into the intermediary grades.

In contrast to our sample’s word reading trajectory, its growth in comprehension was linear.

- Nevertheless, their percentile scores across the four grades were considerably below average (i.e., 24th percentile ~ 35th percentile; see Table 1).
- Although our young readers were steadily developing comprehension skills, they weren’t closing the gap between them and their TD peers.

Results

Conditional Models

- **For word reading**, *letter knowledge* was the only statistically significant predictor of the linear slope, when controlling first-grade word reading and comprehension performance and other predicting variables
- **For reading comprehension**, *vocabulary* and *non-verbal reasoning* were the only statistically significant predictors of slope, when controlling first-grade word reading and comprehension performance and other predicting variables

Results

Why Letter knowledge, not phonological awareness, predicted word reading?

- Letter knowledge tapped phonological processing (e.g., letter-sound naming) as well as print knowledge (e.g., letter naming).
- We required participants to exercise speeded naming of letter sounds and names, letter knowledge may have also measured rapid naming capacity.
- Behavioral genetic literature suggest that the heritability of phonological awareness is shared with word reading only through letter knowledge (Byrne et al., 1995; Erbeli, Hart, & Taylor, 2017)

Vocabulary and Nonverbal Reasoning are important for Reading Comprehension

- Non-verbal reasoning skills are necessary to develop complicated text analysis skills (e.g., inference making; Nation, Clarke, & Snowling, 2002).
- Working memory is too hard for our sample?

Implications for Theory and Practice

1. Although at-risk children may indeed have insufficient domain-general and domain-specific skills, both skill sets are important in reading development.
2. Early word reading and reading comprehension may have relatively independent developmental trajectories and different domain-specific and domain-general predictors.
3. Different development trajectories may be related in part to the shifting instructional focus (e.g., decreasing instruction on word reading), suggesting that they would benefit from intensive instruction at the word-level in first through fourth grade.
4. Besides word reading instruction, early interventionist should **ALSO** consider reading comprehension components such as vocabulary and cognitive processes (e.g., non-verbal reasoning) to facilitate reading comprehension for these children.