Comprehension Strategies to Support Students with Reading Difficulties

Findings from a network meta-analysis of reading comprehension intervention components reveal three strategies that maximize benefits for students in grades 3-12.

Peng Peng and Colleagues, 2023

THIS REPORT SUMMARIZES FINDINGS FROM: "THE ACTIVE INGREDIENT IN READING COMPREHENSION STRATEGY INTERVENTION FOR STRUGGLING READERS: A BAYESIAN NETWORK META-ANALYSIS. "

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STUDENTS ARE FALLING BEHIND IN READING

Since the onset of the COVID-19 pandemic, students are struggling to keep up in reading.

Prevalence: [1]

37%

In 2022, 37% of U.S. fourth graders performed below a basic reading level on the National Assessment of Educational Progress, the highest percentage of students reading below basic level since 2005.

31%

In 2022, 31% of U.S. eighth graders performed below a basic reading level on the National Assessment of Educational Progress, the highest percentage of students reading below basic level since 1995.

Reading skills are crucial for many immediate and long-term outcomes, but many students experience reading difficulties and face challenges with word recognition and/or reading comprehension. [2]

Reading difficulties: Students who have reading levels significantly lower than expected, despite having normal intelligence. [3]

THE IMPORTANCE OF READING COMPREHENSION INTERVENTIONS FOR STRUGGLING READERS

Reading comprehension involves the ability to process text and understand its meaning, as well as integrate text information with what the reader already knows.[4.]

Strategies in this study for supporting struggling readers' comprehension:

| Strategy	Description
Graphic organizers	Teaching students to make graphic representations of the material to assist in comprehension.
Inference	Teaching students to integrate information within text and between the text and one's general knowledge of the topic.
Main idea	Teaching students to integrate the main ideas from the text in a coherent way.
Prediction	Teaching students to utilize what is already known from the text and background knowledge to hypothesize the content of the text and evaluate this hypothesis with the actual content.
Retell	Teaching students to organize information to provide a personal rendition of the text (e.g., using cues such as first, next, last).
Self-monitoring	Teaching students to monitor the understanding of the text through ways such as self-questioning and coherence check.
Text structure	Teaching students the various features of texts (i.e., descriptive, cause and effect, compare and contrast, problem and solution).

Reading comprehension strategies are helpful when used alone but may be more effective when several effective strategies are used together.

But more strategies may not always be better: given limited resources and time, educators need to know which strategies or combinations of strategies are most likely to improve student reading outcomes.

WHICH STRATEGIES OR COMBINATIONS OF STRATEGIES ARE THE MOST EFFECTIVE?

No single reading strategy was found to be "the most important." But, using a combination of Main Idea + Text Structure + Retell strategies produced the maximum benefits among students with reading difficulties.

A key scaffolding ingredient for success is providing readers with background knowledge instruction. Background knowledge instruction involves teaching vocabulary and/or content knowledge.
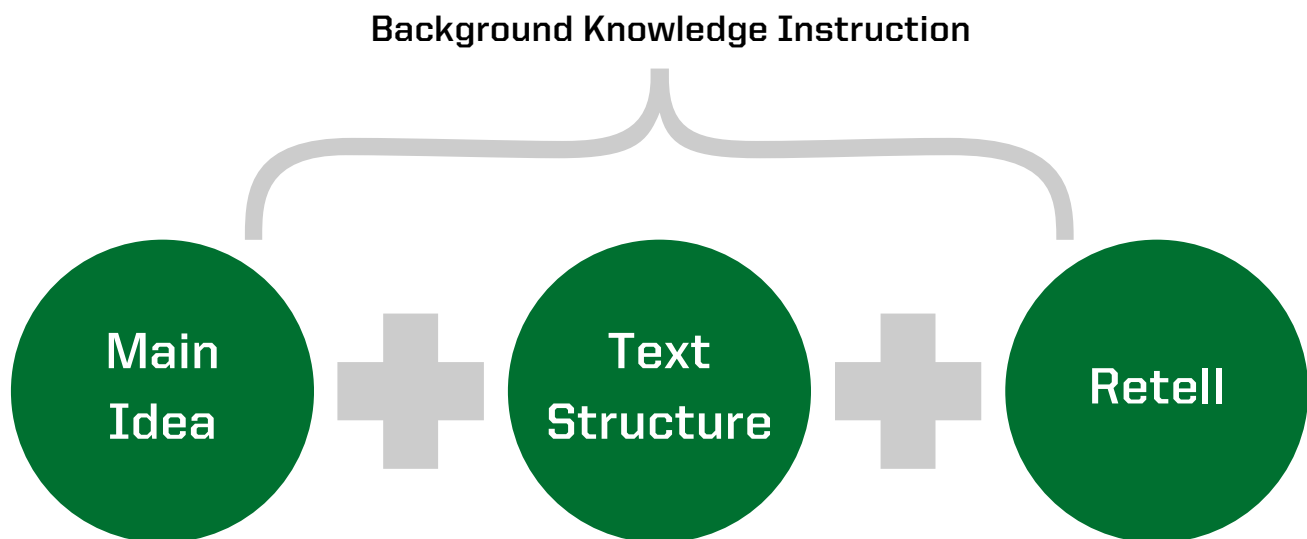
Background Knowledge Instruction

Main Idea + **Text Structure** + **Retell**

When Background Knowledge Instruction was included in the intervention, there was more than twice the benefit for the intervention group than when it was not included.

Including background knowledge instruction can help students with reading difficulties by:
- facilitating knowledge retrieval
- reducing the cognitive load of reading comprehension strategies
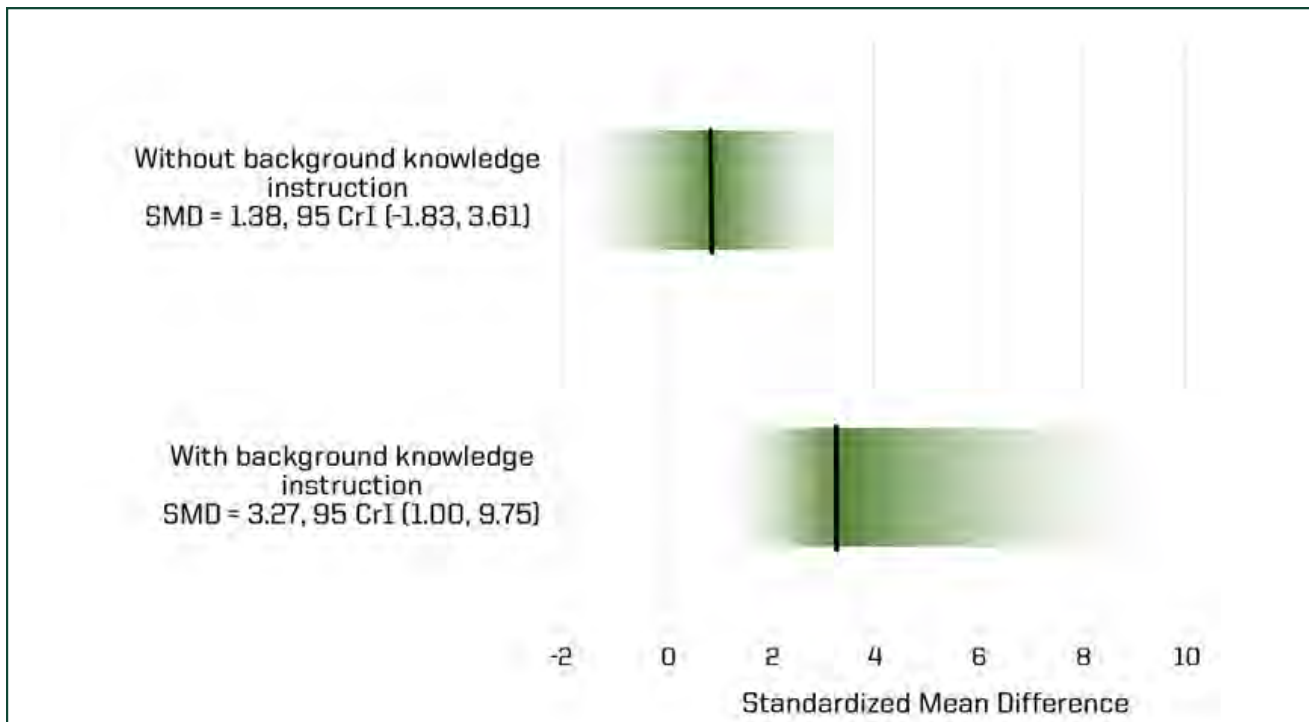
The gradient chart below shows that when Background Knowledge Instruction was included in the intervention, there was more than twice the benefit for the intervention group than when it was not included.

Without background knowledge instruction
SMD = 1.38, 95 CrI (-1.83, 3.61)

With background knowledge instruction
SMD = 3.27, 95 CrI (1.00, 9.75)

-2   0   2   4   6   8   10
Standardized Mean Difference

Other beneficial strategies and combinations of strategies included:
- Main idea + Text structure + Self monitoring + Graphic organizers
- Main idea + Self monitoring
- Graphic organizers
- Main idea

All four were significantly superior to the control group.*

Notably, the number of strategies in a combination - two vs three vs four - did not influence reading comprehension outcomes. In other words, simply including more strategies did not lead to better outcomes.

All other strategies and combinations of strategies had unclear effectiveness; students in those intervention groups did not have outcomes statistically significantly different from the control group.
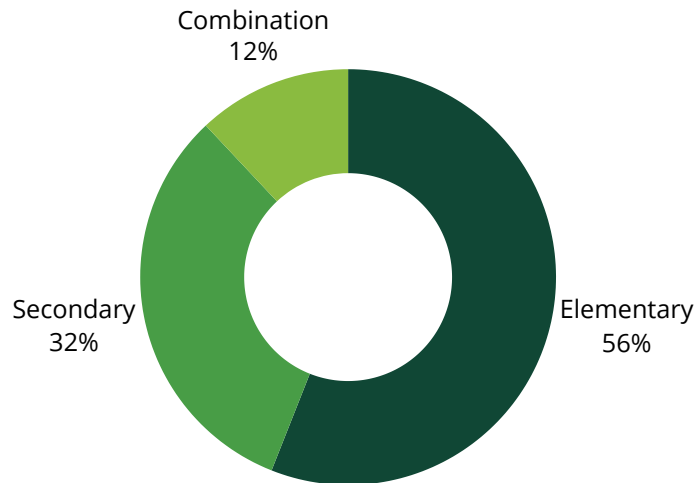
*For this study, control groups included small group reading intervention, typical school instruction, or no instruction.

Which students and schools were included in this study?

Total:

The analysis included approximately 6,349 students.

5.

Combination 12%

Secondary 32%

Elementary 56%

Grade levels:

3,555 elementary students (56%), 2,007 secondary students (32%), and 787 from a range of elementary and secondary grades (12%).

At-risk status:

Students were primarily at risk (n=4,020; 63%), or already identified with a learning disability (n= 2,329; 37%).

At Risk: 63%	Learning Disability: 37%

Socioeconomic status:

2,022 students were from lower to lower-middle socioeconomic backgrounds (32%), 2,484 students were from middle to middle-upper socioeconomic backgrounds (39%), and 59 students were from upper socioeconomic backgrounds (1%)*.

*Total does not equal 100% due to missing data.

Methods

29,213 articles from database search

1,184 articles screened for full text

52 articles

Bayesian Network Meta-Analysis was used in this study. This approach allowed the authors to estimate the relative efficacy of each intervention strategy (or strategy combination) compared to the control condition.

Limitations to Note

The authors assessed the included studies for quality, and the overall average study quality was low (Mean = 1.02 on a scale ranging from low quality = 1 to high quality = 2), based on the authors' assessment of each study's research design, comparison group, and implementation fidelity. However, outcomes did not differ by study quality in the authors' moderator analysis (B = 0.62; 95% CrI: -0.74, 7.47).

Due to limited information, the authors could not investigate whether reading fluency influenced the network results.

References:

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3. Swanson, E., Barnes, M., Fall, A. M., & Roberts, G. (2018). Predictors of reading comprehension among struggling readers who exhibit differing levels of inattention and hyperactivity. *Reading & Writing Quarterly*, *34*(2), 132-146. https://doi.org/10.1080/10573569.2017.1359712

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5. Filderman, M. J., Austin, C. R., Boucher, A. N., O'Donnell, K., & Swanson, E. A. (2022). A meta-analysis of the effects of reading comprehension interventions on the reading comprehension outcomes of struggling readers in third through 12th grades. *Exceptional Children, 88*(2), 163-184. https://doi.org/10.1177/00144029211050860

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