Making In-the-Text Connections to Support Struggling Readers’ Comprehension
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Many students struggle with reading comprehension, even after receiving generally effective, research-based intervention. Thus, it is important to understand for whom and under what conditions reading comprehension interventions are most effective (Faggella-Luby & Deshler, 2008). To attain such an understanding, researchers have emphasized the need to strengthen connections between theory and educational practice (e.g., Pressley, Graham, & Harris, 2006). This presentation reports results of research that uses insights from cognitive science to develop interventions for children who struggle with reading comprehension. We highlight ways that we have attempted to replicate findings related to the effects of questioning intervention on the comprehension of subgroups of struggling readers.

From a cognitive psychology perspective, successful reading comprehension depends on the construction of a coherent representation of text in memory (Kintsch, 1998). This coherent representation contains information from the text, is integrated with background knowledge, and can be accessed and applied in a variety of situations (Trabasso, Secco, & van den Broek, 1984). Readers may struggle to comprehend text because they may not have (or efficiently access) relevant background knowledge, may not make connections among relevant parts of the text, or may not integrate background knowledge with text-based information (Cain & Oakhill, 2007).

One way to guide readers toward a coherent representation of text is to ask ‘causal’ questions that direct their attention to causal relations in text. In a series of experimental studies and field trials, we have examined the effects of a causal questioning approach on the comprehension of 4th-grade readers. First, we compared causal questioning (specific “Why” questions asked during reading) and general questioning (generic prompts to make connections while reading) in brief, one-on-one sessions with 4th-grade readers (n = 78). Causal questioning led to more complete recalls of text than did general questioning (d = .53).

We attempted to replicate this finding in a randomized field trial in which struggling-, average-, and good readers (n = 246) were randomly assigned to Causal, General, or “W” questioning interventions delivered in twenty-seven 20-30 min peer-mediated sessions. There was no main effect of question type; however, we observed an interaction between question type and subgroups of struggling readers. The two subgroups were ‘Paraphrasers’ (who make few inferences, instead repeating or paraphrasing the content of text) and ‘Elaborators’ (who make
elaborative inferences that do not always support comprehension). Elaborators outperformed Paraphrasers in the causal condition ($d = .86$), and Paraphrasers outperformed Elaborators in the general condition ($d = 1.46$). This finding suggests that subgroups of struggling readers may respond differently to different questioning approaches, but requires replication.

Next, we compared causal and general questioning in the context of a small-group intervention designed specifically for struggling comprehenders. Readers ($n = 62$) were placed in groups of 3-5 students and randomly assigned to causal or general questioning. Tutors delivered intervention for 20-30 min, 3 times/week for 18 sessions. Readers in the causal condition recalled higher proportions of text than did those in the General condition ($d = .88$). This time, there was no subgroup x intervention interaction. This may be because, while the earlier intervention was provided in a 1:1 peer-mediated format, the current intervention was delivered in a small-group context, in which Paraphrasers and Elaborators received instruction together. Further analyses revealed that prompting was critical to readers' ability to make causal connections while they read, leading us to wonder whether prompting directed at readers' specific difficulties would enhance their comprehension of text, regardless of subgroup status.

**Purpose and Research Questions**

The purpose of the current study was to extend the above findings by examining the type of feedback provided during a causal questioning intervention. We compared a "direct" feedback approach (designed to be standardized and efficient) to a "scaffolded" feedback approach (designed to be responsive to individual readers). A second purpose was to determine whether the effects of feedback varied by subgroups of struggling readers. Research questions included:

1. Does a causal questioning approach lead to improvements in struggling readers’ recall of highly-connected events in narrative fictional and nonfictional text over time?
2. Are there differential effects of direct versus scaffolded feedback on struggling readers’ recall of highly-connected events in narrative fictional and nonfictional text?
3. Do the effects of direct versus scaffolded feedback vary by subgroup of struggling readers (Paraphrasers versus Elaborators)?

**Method**

**Setting and participants.** The study was conducted in one large urban and one midsized suburban district. Schools varied widely in percent of students on free/reduced lunch, ethnic diversity, and ELL populations. Fourth-graders were identified for intervention in two phases: (1) students ($n=461$) were administered a Curriculum-based Measurement (CBM) Maze task; (2) those scoring below the 25th percentile on Maze and below the 50th percentile on a district reading measure ($n=137$) were administered a CBM oral reading measure. Those reading above 90 correct words in 1 min were identified for the intervention ($n=61$), and were administered a Think-Aloud task to identify subgroups: Paraphrasers ($n=15$) and Elaborators ($n = 46$).

**Intervention.** Intervention was delivered by trained research assistants in small groups for 30 min, 3 times per week, for 19 sessions. It consisted of: (1)
preteaching key vocabulary, (2) tutor model followed by student oral reading of
text, (3) embedded questions that prompted students to make causal connections
during reading, and (4) direct or scaffolded feedback.

**Research design.** Small groups of 3-5 students were assigned randomly to
direct or scaffolded feedback conditions. A mixed (one within/one between) pre-
mid-posttest design was used, with time as the within-subjects factor and type of
feedback as the between-groups factor.

**Data collection and analysis.** Dependent variables collected at pre-, mid-, and
posttest included amount of prompting needed to make correct text-based
connections, recall of highly-connected events in narrative fiction and nonfiction
text, and words read correctly in 1 min.

**Findings.** Results revealed significant improvement over time in terms of
students’ recall of gist and highly-connected events in narrative fiction and
nonfiction and words read correctly in one min (but only when intervention text
type corresponded with test text type). There were no reliable differences between
types of feedback, and no reliable interactions between subgroup and type of
feedback.

**Conclusions**

Findings provide preliminary support for causal questioning in improving
struggling readers’ construction of coherent representations of narrative fiction and
nonfiction. However, subgroup by intervention interactions observed in peer-
mediated intervention have not replicated in small-group instruction. Possible
reasons include the variation in instructional format (teacher-led small group
versus classwide peer-mediated) and in instructional delivery (e.g., incorporating a
feedback approach that is responsive to difficulties encountered by struggling
readers). The next step is to test the fully developed intervention in an experimental
field trial.

**References**

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