

Improving Reading Comprehension by Fostering Children's Engagement with Books During Summer Vacation: A Cluster-Randomized Trial Comparing Content- and Strategy-Oriented Instruction for Elementary School Children

James S. Kim¹
Helen Kingston
Lisa Foster
Harvard University

Thomas G. White
University of Virginia

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¹Corresponding author: James S. Kim, Harvard University, Graduate School of Education, kimja@gse.harvard.edu Please do not cite or circulate without the authors' permission.

Abstract

The effects of a voluntary summer reading intervention with teacher-directed comprehension lessons were evaluated in a cluster randomized trial involving 19 elementary schools (K-5). During the last month of 3rd grade, schools were stratified by pretest measures of reading achievement and poverty and randomly assigned to implement content- or strategy-oriented lessons. In content-oriented lessons, teachers modeled a before, during, and after comprehension routine using narrative and informational texts. In the narrative routine, teachers modeled how (a) to make a story guess using content drawn from text, (b) to answer questions based on narrative text structures (e.g., characters, setting, plot), and (c) to check similarities and differences between the story guess and actual story. In the informational text routine, teachers modeled how (a) to answer questions about a topic using background knowledge about the text, (b) to discuss questions based on expository text structures (e.g., description, sequence, problem-solution), and (c) to check new content learned about the topic. We compared the content-oriented lessons to strategy-oriented lessons, in which teachers modeled how to apply four comprehension strategies (i.e., making connections, predictions, re-reading, asking questions) to both narrative and informational texts. During summer vacation, children in both conditions received 2 lesson books and 8 books matched to their reading level and interests and a reading postcard with each book. Children in the content-oriented lesson condition enjoyed larger gains in narrative comprehension ($d = .11$) than children in the strategy-oriented lessons. The results indicate that qualitative changes in instruction at the end of the school year can improve reading engagement and reading comprehension during summer vacation.

Keywords: *reading comprehension, content and strategy instruction, voluntary summer book reading, cluster randomized controlled trial*

Introduction

The problem of summer reading loss among low-income children has been amply documented by researchers. On average, summer vacation creates a 3-month gap in reading achievement scores between low-income and middle-income children (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Over time, income-based disparities in reading achievement appear to grow more rapidly during the summer months than the academic school year (Alexander, Entwisle, & Olson, 2007; Downey, von Hippel, & Broh, 2004). To accelerate the reading gains of low-income children, researchers have recently designed and evaluated interventions that encourage children to read books at home during summer vacations (McCombs et al., 2011). Efforts to promote children's book reading activities at home are based on sound experimental evidence (Allington et al., 2010). Numerous correlational studies indicate that regular exposure to print over the life span is a strong predictor of reading comprehension and verbal ability (Lindsay, 2010; Mol & Bus, 2011; Stanovich, 2000).

Although print exposure is clearly a well-established mechanism underlying growth in reading ability, it is unclear whether and how teachers can promote children's reading engagement and comprehension during the summer months. In the elementary grades, there is some evidence that teacher-directed instruction at the end of the school year may enhance the benefits of children's summer book reading activities at home. Two recent experimental studies provide growing evidence that teacher scaffolding of summer book reading may enhance comprehension gains. Kim and White (2008) conducted an experimental study in which children who received matched books during the summer performed no better than a control group; however, children who participated in teacher-directed comprehension lessons and received books matched to their reading level and interests performed significantly higher on posttest

measures of reading comprehension. The non-significant difference between children in the matched books and the control group were recently replicated in a large statewide evaluation involving 1,785 low-income 3rd graders in Texas (Wilkins et al., 2012). The results from these two studies suggest that effective teacher-directed lessons at the end of the school year and access to matched books at home are both needed to enhance the effectiveness of voluntary summer book reading. To date, however, no study on voluntary summer book reading has specifically isolated the effects of teacher instruction on student reading outcomes.

In this study, we conducted a cluster randomized trial involving 19 elementary schools and compared two approaches to comprehension instruction. In content-oriented lessons, teachers instructed children to apply two comprehension routines with texts used in classroom lessons and with texts read at home during the summer. In the strategy-oriented lessons, teachers instructed children to apply one comprehension routine with texts that children read in their classrooms and homes. During summer vacation, children in both conditions received the 2 lesson texts and 8 texts matched to their reading level and interest. Each book also included a reading postcard that prompted children to use the routines learned in their respective classroom lessons. Children in the content-oriented lesson condition enjoyed larger gains in narrative comprehension ($d = .11$) than children in the strategy condition. In the following section, we define comprehension routines, explain how content-oriented routines may improve text comprehension, describe the study rationale, and expand on our theory of change.

Defining Comprehension Routines

Duke and Pearson (2002) assert that comprehension routines are an “integrated set of practices that could be applied regularly to one text after another, and in the process, provide students with two benefits: (1) better understanding of the texts to which the routines are applied,

and (2) the development of an infrastructure of processes that will benefit encounters with future text, especially texts that students must negotiate on their own” (p. 225). Given this definition, teachers can instruct children to apply comprehension routines to texts during classroom lessons and promote independent practice at home with books that children must read on their own. The proportions of teacher and student responsibility needed to implement the comprehension routine will vary from the classroom, when teachers direct instruction, to the home, when children must initiate and apply the routine on their own or with family support to new texts (Pearson & Gallagher, 1983, p. 337). In the summer months, then, children must assume responsibility for applying the routine with new texts that must be comprehended without teacher support. In this paper, we adopt the term comprehension routine to refer to an integrated set of practices that children use before, during, and after reading a text in the classroom and at home.

How Content-Oriented Routines May Improve Text Comprehension

Content-oriented routines may improve children’s ability to activate and integrate information in text with background knowledge. Kintsch’s (1994) construction-integration model of comprehension forms a strong theoretical foundation for lessons in which children use content and information from text to create a situation model—a description of the narrative world or subject matter implied by the text (Graesser et al., 2011). In other words, children must grasp the literal meaning of the textbase and integrate the new information with prior knowledge to form a coherent representation of text. The instructional implications of the construction-integration model of comprehension highlight the important role that teachers can play in focusing children’s attention to text-based content before, during, and after reading a lesson text. In the before reading activity, teachers can provide children with important content, facts, and information necessary to understand focal texts used in lessons (Dole et al., 1991; Williams et

al., 2005). During a reading activity, teachers can ask meaning-based questions that enable students to build a coherent representation of text (McKeown, Beck, & Ronette, 2009; Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009). In addition, sociocultural theories of learning suggest that higher-order comprehension of text depends on social interactions (Vygotsky, 1978, 1986), and teacher-directed discussions about the content in text can facilitate a shared understanding of text (Tharp & Gallimore, 1988). After reading a text, teachers can prompt students to use important text-based information to create a summary of text (Williams et al., 2005). In sum, content-oriented routines prompt children to use text-based information to improve comprehension.

Content-oriented routines appear to be a promising intervention strategy for improving reading comprehension in the elementary grades (Shanahan et al., 2010). In a study involving second-grade students, Williams et al. (2005) compared the effects of (a) a text structure program that instructed children to comprehend compare-contrast expository text, (b) a content program that focused children's attention on expository text, and (c) a control group. In the content lessons, teachers employed a before, during, and after reading comprehension routine with expository text. Before reading the text, teachers activated children's background knowledge by leading a discussion focused on information students knew about the two target animals that were the focus of text and additional questions emerging from the discussion. During the reading activity, teachers read from an encyclopedia and/or trade books and asked questions about text, and students organized content into graphic organizers. After reading, teachers prompted students to share information about the two animals in a discussion. Although the goal of this study was to assess the effects of the text structure lessons, there was suggestive evidence that the content lessons were effective in improving knowledge and facts about animals. For

example, children in the content condition scored $d = 1.41$ standard deviations higher than the text structure condition on content measures that assessed factual details, although this difference was not statistically significant due to the small sample size of classes for content lessons ($n = 4$) and text structure ($n = 4$). In a study involving fifth-grade students, McKeown, Beck, and Ronette (2009) found that children in content lessons outperformed the strategy condition on the length ($d = .49$) and quality ($d = .46$) of oral recalls. Although the content lessons developed by Williams et al. (2002) and McKeown, Beck, and Ronette (2009) vary along several dimensions, each approach rests on theories of text processing, in which the end goal is to form a rich and coherent situation model implied by the text (Kintsch, 1994). Moreover, the encouraging findings of the content approaches raise questions about transfer. McKeown et al. (2009) specifically noted the desirability of measuring students' comprehension of text read independently with no teacher support.

How, then, might recent research findings inform the implementation of content-oriented routines in the classroom? To begin, content-oriented routines often differ for narrative and informational texts, because text structures are unique to each genre. In a narrative routine, teachers focus children's attention on new information about the critical story elements in narrative text. Because narrative texts include a story grammar, teachers can provide a preview of narrative text that focuses students' attention to information that is important to understanding the characters, settings, plot, and theme (Graves, Cooke, & LaBerge, 1983; Graves & Prenn, 1986). In this study, our narrative text routine was based on the story impressions tool that prompts children to make a story guess using content drawn from the text (McGinley & Denner, 1987). Story impressions are flexible tools that can be embedded in a before, during, and after reading routine. For example, some researchers have defined story impressions as an effective

comprehension strategy involving prediction (Duke & Pearson, 2002, p. 213) as well as an effective discussion activity for teaching word meanings (Stahl & Nagy, 2006, pp. 71-76). In the story impressions activity, the accuracy of the prediction is not as critical as encouraging engagement with text and deeper comprehension (Anderson & Pearson, 1984). Story impression uses narrative text structure to identify key words that form a story grammar (e.g., characters, settings, plot). Thus, the key words that form a story impression are purposefully selected in the order they appear in the story and identify features common to narrative text. Based on prior research, we developed a narrative routine, in which teachers instruct children (a) to make a story guess using words and phrases based on common text structures, (b) to answer literal and inferential questions that help build a situation model, and (c) to check their guess with the actual story by determining which guesses were similar to or different than the actual story.

Teachers can also model an informational text routine in classroom lessons. Although the terms expository text and informational text are frequently used interchangeably, the primary function of informational text is to “communicate information about the natural or social world” (Duke, 2000, p. 205). In an informational text routine, teachers model how to generate pre-reading questions about a topic using background knowledge. Many before reading routines with informational text are designed to activate children’s background knowledge and promote question-generation activities. The goal of interactive strategies is to promote group discussion and elicit student’s prior knowledge about the topic that will be the focus of a reading activity (Dole, Valencia, Greer, & Wardrop, 1991; Williams et al., 2005). In this study, our informational text routine was based on KWL charts that prompt children to generate questions about a topic using background knowledge (Carr & Ogle, 1987; Ogle, 1986). KWL charts can be easily implemented in a before, during, and after sequence of reading activities, and have been adapted

in other content approaches to comprehension instruction (Williams et al., 2005). For example, it begins with a pre-reading activity designed to activate children's background knowledge about a topic (what do I "K"now). During the reading of text, the questions about "W"hat students want to learn can be jointly determined through a discussion involving student input and teacher questions based on text structure. After reading activities focus on the questions prompted by the pre-reading activity and addressed during the text-based discussion to determine what students have "L"earned. Therefore, the KWL chart can facilitate the informational text routine during classroom lessons. Based on prior research, we developed an informational text routine, in which teachers instruct children to (a) to answer questions about a topic using children's background knowledge, (b) to answer questions about a topic based on expository text structures, and (c) to check new content learned about a topic.

To promote transfer of the routines from the classroom to home, children need to apply the narrative and informational text routines to books that will be read independently during the summer months. Each child in our study received 10 books and a postcard that instantiated the goals of classroom instruction into book reading activities. Children were mailed the 2 lesson texts and 8 high-interest books that were within the child's independent reading level, as measured by lexile scores. An important goal of the lexile system is to improve the likelihood that a child will benefit from reading text in their zone of proximal development (Vygotsky, 1978). According to lexile theory, a well-matched text will provide sufficient confidence and challenge for a child to read text independently, to acquire new vocabulary, and to improve comprehension (Schnick, & Knickelbine, 2000). The lexile framework is based on the Rasch model, which places measures of reader ability and the readability level of texts on a common scale (Rasch, 1980). To determine whether texts are appropriately matched to children,

researchers usually examine whether the lexile level of a specific text/book is between 100 lexiles below to 50 lexiles above a child's lexile level (Wilkins, et al. 2012; Wright & Stone, 2004). To summarize, each child received 2 books in the mail on a biweekly basis from June to the end of August and completed up to 10 postcards.

Why Should We Compare Content- and Strategy-Oriented Routines?

Up to this point, we have clearly focused on the theoretical and empirical work supporting content-oriented instruction in general and narrative and informational text routines in particular. Why, then, should we compare content-oriented instruction to strategy-oriented instruction? Evidence from an experimental comparison of the two instructional approaches would generate important knowledge to advance literacy research and practice. In this study, we replicated the lesson condition used in the Kim and White (2008) strategy-oriented lessons and compared it to our content-oriented lesson condition for several reasons. In the Kim and White (2008), the strategy-oriented lessons included a single routine that children learned to use with both narrative and informational texts. Teachers modeled how to make predictions, to make text-to-text and text-to-self connections, to ask questions, and to re-read and summarize texts. After reading texts, teachers modeled how to select a favorite 100-word passage and read aloud to a family member. The post-reading oral reading activity was designed to enhance engagement with texts, family involvement, and reading prosody.

There are several strengths and limitations of both strategy- and content-oriented oriented lessons, especially as they are implemented in the context of a voluntary summer book reading intervention. On the basis of prior research, we would argue that there is larger body of research supporting strategy-oriented instruction than content-oriented instruction. For example, the strategy-oriented routine in the Kim and White (2008) study was based on prior reviews of

effective comprehension strategy, the gradual release of responsibility model of instruction from teacher to students, and a large number of efficacy studies (Duke & Pearson, 2002; Gallagher & Pearson, 1983; Kim & White, 2008; National Institute of Child Health and Human Development, 2000; Rosenshine & Meister, 1994; Shanahan et al., 2010). The lessons in the Kim and White (2008) study were not heavily scripted, and were adaptable for use with a variety of narrative and informational text and children at varying developmental stages in reading (grades 3 to 5). In addition, the postcards based on the strategy-oriented routine prompted children to read aloud a short 100 word text and then to get feedback from a family member on the oral reading. Because many children in third-grade are still building reading fluency, the strategy-oriented lessons with a fluency activity may be more effective than our content-oriented lessons, which do not prompt children to read aloud with family members during the summer. The strategy-oriented lessons were also designed by a team of researchers and practitioners, who explicitly instructed children to use multiple strategies as a means to acquire knowledge and to improve comprehension (Duke & Pearson, 2011). Despite the potential benefits of strategy-oriented instruction, it is unclear whether the effects of strategy-oriented instruction can be replicated when the counterfactual is not an untreated control group. Kim and White (2008) found that children who participated in strategy-oriented lessons and received matched books in the summer outperformed control children in reading comprehension. However, this finding may be an artifact of the additional instructional time and/or the additional books that children received during the summer rather than the efficacy of the comprehension strategies.

In contrast to strategy-oriented lessons, content-oriented lessons have been subjected to fewer experimental studies. In addition to this research gap, we are aware of no studies that attempt to instantiate text-processing theories into a narrative and informational text routine. One

recent experimental study that compared content and strategy instruction provides encouraging evidence that content approaches can improve the length and quality of recall of transfer text (McKeown, Beck, & Ronette, 2009). The results from this study indicate that content-oriented lessons based on Questioning the Author can facilitate children's efforts to integrate ideas into a coherent mental representation of transfer text. In our study, we developed two content-oriented routines, one for narrative text and one for informational text. It should be emphasized that there was more scaffolding to support engagement with narrative text. Each story impression was unique to each narrative text whereas each KWL routine was identical across all informational texts. As a result, the story impressions activity provides children with a pre-reading preview using specific information and content drawn from a book. In the context of a voluntary summer book reading intervention, the effort to create several hundreds of book-specific story impression routines required additional cost and training and may potentially limit the scalability and cost-effectiveness of the intervention. Despite these challenges, we adhered to the procedures used to create a book specific story impression routine and prompted children to make a story guess using the words and then to check the guess after reading. The activity was designed to integrate background knowledge afforded by the story impression words with text-based information acquired during the reading activity. Because our content-oriented routines have never been subjected to an experimental evaluation, it is unclear whether content-oriented routines learned in classrooms generalize to broad improvements in reading comprehension.

Theory of Change

In light of the gaps in current research, it seems desirable and necessary to conduct a well-designed cluster randomized experiment to examine whether content- or strategy-oriented routines improve reading comprehension. Guided by the bioecological model of human

development (Bronfenbrenner & Morris, 1998), Figure 1 displays a theory of change describing how the comprehension routines are embedded in key intervention settings—classrooms and homes—as children finish the academic year and begin summer vacation. The first dimension in the logic model is time, including the comprehension routines that occur in the spring, summer, and fall months. During the end of the school year, teachers implement content- or strategy-oriented lessons that enable children to extract and construct meaning through interactions with narrative and informational texts (Shanahan et al., 2010; Snow, 2002). By definition, teacher-directed instruction in classrooms is meaning-focused since neither the content- nor the strategy-oriented lessons provides word reading instruction (Connor et al., 2009).

During the summer months, the books and postcards are designed to promote child-initiated book reading activities and family involvement in after reading activities. Thus, the onset of summer vacation alters the nature of our intervention as teachers release responsibility to children for independently carrying out the routines learned in classrooms with new books read at home. Consistent with current research and perspectives, we operationalize reading engagement (Guthrie et al., 2004) as a multi-dimensional construct, involving time on task measures, affective measures like enjoyment of literacy, depth of cognitive processing, and activity-based measures. In the context of our study, we measure reading engagement in three ways, including (a) the amount of book reading on a behavioral measure; (b) the kinds of interactions that children engaged in while reading narrative and informational text; and (c) the total number of books children read during the summer months. Finally, we administered a standardized measure of comprehension at the beginning of the academic school year to assess effects on narrative and expository text comprehension.

(Figure 1)

Method

Participants

A total of 981 Grade 3 children in a mid-sized urban district in North Carolina participated in this experimental study. Table 1 provides the descriptive characteristics of the child sample at the beginning of the study. Low-income children (i.e., 73% were eligible for free lunch), Black children (49%), and Latino/a children (32%) comprised a clear majority of the sample, and approximately 30% of the children were identified as limited English proficient (LEP). Baseline scores on the Iowa Test of Basic Skills indicate that the sample mean was close to the national norm. Based on the 2010 Census, the percentage households below the US poverty level ($M = 11$, $SD = 6$) was below the national average of 15.3. There was enormous variability in neighborhood poverty levels ($Min = 1.45\%$, $Max = 28.04\%$).

(Table 1)

Design

This study is part of a larger randomized experiment that is designed to examine (a) the effects of two different comprehension approaches and (b) the effects of additional scaffolding of summer book reading involving follow-up teacher phone calls. In spring 2011, a total of 19 K-5 elementary schools were stratified by poverty and achievement levels and randomly assigned to implement either content- or strategy-oriented comprehension lessons. After schools were assigned to lesson condition, children and teachers were randomly assigned to an untreated control condition, a classroom lesson and summer book condition, or a classroom lesson, summer book, and teacher call condition. A second study will focus on the effects of the third condition involving teacher phone calls.

In this study, we focus on the first goal of comparing school-level comparisons of the content- and strategy-oriented lessons. We pooled data from the two experimental conditions (summer books and summer books and teacher calls conditions), because both groups of children received the lessons and summer books. Because only 11% of the children received 3 teacher phone calls, there was little difference in the intervention activities that were part of the two experimental conditions. More importantly, there was no interaction between classroom lesson condition and student phone call condition on posttest comprehension outcomes. Therefore, in subsequent analyses, we combine data for children in the two experimental conditions. The school, teacher, and student sample size were the following: In the 9 content-oriented lesson schools, 461 children were nested within 24 classrooms, yielding an average class size of 19 children. In the 10 strategy schools, 520 children were nested within 30 classrooms, yielding an average class size of 17.33 children. Children who remained in the study at posttest were administered reading tests and surveys in the second week of September 2011 at the beginning of fourth-grade on the Iowa Test of Basic Skills (ITBS), a standardized comprehension test. We measured performance on reading comprehension, and separately for narrative and expository comprehension.

At the beginning of the study, there were no significant differences between schools implementing content lessons ($M = 183.06$, $SD = 24.24$) and strategy lessons ($M = 184.73$, $SD = 25.35$) on reading comprehension ($p = .973$). In addition, there was no group difference in the percentage of low-income children ($p = .674$), and the percentage of national board certified teachers ($p = .48$). Although some children were lost from pretest to posttest (17%), there was no relationship between lesson condition and attrition rates for reading comprehension, χ^2 (981)

= 2.08, n.s. Similarly, there was no relationship between condition and attrition rates for narrative comprehension, $\chi^2(981) = 2.04$, n.s, or expository comprehension, $\chi^2(981) = 1.85$, n.s. In addition, there was no significant difference between the pretest scores of children who were lost to attrition and those who remained in the study for each of the three posttest comprehension measures.

Measures

Student demographic variables. We obtained student demographic data from district administrative files, including gender, ethnicity, the primary language spoken at home, income status (i.e., eligibility for free lunch), and whether the child had limited English proficiency.

Iowa Test of Basic Skills, Reading Comprehension (ITBS). The pre and posttest measure was the ITBS comprehension test. Level 9, Form A was administered in spring 2011 when children were in third-grade and Form C was administered in fall 2011. The ITBS is 37-item comprehension test of narrative ($n = 20$) and expository texts (17). The ITBS is a highly reliable assessment (i.e., KR-20 coefficients above .93 and equivalent form estimates of .86 or higher). Reliabilities on the pretest narrative ($\alpha = .86$) and expository subtests ($\alpha = .82$) and the posttest narrative ($\alpha = .91$) and expository subtests ($\alpha = .88$) exceeded .80. In our sample, test-retest reliabilities were .80 for total comprehension, .74 for narrative comprehension, and .70 for expository comprehension. Thus, the ITBS comprehension total and narrative and expository subtests yielded good internal reliability and stability over time. The total comprehension scores are vertically equated through Item Response Theory scaling to yield a continuous measure of reading ability, the Developmental Standard Score. The ITBS also provides a 100-point Lexile range that represents each child's independent reading level ($M = 591.75$, $SD = 188.08$, $Min =$

110, $Max = 1,100$). We standardized the ITBS score to have a mean of 0 and standard deviation of 1.

Reading preference categories of children's books. Each of the 484 books were coded for 18 unique categories (adventure, animal fiction, animal nonfiction, biographies, stories about boys, cultures and countries, fables, interesting fictions, friendship, stories about girls, historical fiction, history, humor, mystery, school stories, science, sports biography, sports stories). Children completed a 4 point scale (I don't like it, I like it, It's okay, I really like it) indicating their reading preferences. Data from the preference score and pretest reading score were used in a computer algorithm that identified books that were matched to each child's interest and reading level.

Text characteristics of children's books. For each child in the study, we computed text characteristics for each of the 10 books and created a mean score for the following text characteristics, including descriptive statistics for the mean Lexile level, mean number of words, the mean sentence length, and the mean log word frequency, i.e., the logarithm of the number of times a word appears in each 5-million words of the MetaMetrics research corpus of 571-million words. On average, children were matched to 7 narrative ($M = 6.97$, $SD = 2.45$) and 3 expository texts ($M = 3.02$, $SD = 2.45$), 8 matched books with a mean Lexile ($M = 560.12$, $SD = 185.23$) below the mean child lexile ($M = 597.98$, $SD = 189.52$).

Lexical diversity characteristics of children's books. For each book, we also created measures of lexical diversity capturing the type-token ratio (i.e., the ratio of the number of different words to the total number of words). We created type-token ratios for word zones 1 to 4 based on work by Hiebert and Zeno. On average, each book had 10,439 words and 936 unique words among 10,439 words for a type-token ratio of .09.

Summer book reading postcards. The reading postcard differed based on the lesson condition implemented at school. For children in the content-oriented lesson condition, the reading postcards were unique to text genre. Postcards for narrative text encouraged children to use words and phrases from the actual book to make a guess about the content of the story and then to check the guess after reading the book. Postcards with expository texts prompted children to use background knowledge to ask new questions about the text. For children in the strategy-oriented lesson condition, the reading postcards were similar for both narrative and expository texts. All postcards prompted children to use up to 4 comprehension strategies (making connections, re-reading, making predictions, and asking questions). We coded postcards in two ways. First, all children were given a score for the number of postcards returned. A score of 0 indicated that children did not turn in a postcard. For the full sample of 979 children, 59% of children returned at least 1 postcard during the summer and children returned approximately 3 postcards, on average ($M = 2.94$, $SD = 3.27$, $Min = 0$, $Max = 10$). Second, we treated data as missing if children did not turn in postcard. For the sample of 544 children who returned at least 1 postcard, the mean postcard return rate was 4.24 ($SD = 2.89$)

Amount of book reading and quality of reader-text match. To assess book reading activities, children completed a fall survey in which they were asked about the total number of books read, the number of books checked out of the library, and the number of books bought at the bookstore. The response options ranged from 1 (0–1 book), 2 (2–3 books), 3 (4–5 books), 4 (6–7 books), 5 (8–9 books), or 6 (10 or more books). Descriptive statistics indicated that children read approximately 7.5 books ($M = 4.57$, $SD = 1.55$), checked out 3.5 books from the library ($M = 2.49$, $SD = 1.81$), and bought 2.5 books from the book store ($M = 1.99$, $SD = 1.50$). In addition, to assess children’s self-perceptions about the difficulty level of the books they read

during summer, we administered the question, “The books I read this summer were? (a) too hard, (b) just right, (c) too easy.”

Classroom lesson fidelity and adherence check. We developed an adherence checklist for the 6 content lessons ($M = 36.83$, $SD = 8.50$, $Min = 22$, $Max = 42$) and the 6 strategy lessons ($M = 30.5$, $SD = 6.38$, $Min = 22$, $Max = 29$). We randomly selected and video-taped two full-length lessons from each participating classroom to assess each teacher’s adherence to the lesson script for either the content or strategy lessons. On average, teachers adhered to 72% of the lesson components ($M = .72$, $SD = .16$, $Min = .15$, $Max = .99$).

Classroom discourse measures. We used CLAN (MacWhinney, 2012) to analyze discourse measures based on verbatim audio transcriptions of one randomly selected lesson. Descriptive statistics were based on the number of total words spoken ($M = 4,100$, $SD = 1,493$) and indicated that the number of words spoken by children ($M = 507$, $SD = 459$) was lower than the number of words spoken by teachers ($M = 3,592$, $SD = 1,327$). Across the 51 classrooms, the percentage of teacher talked (88%) exceeded the percentage of child talk (12%).

Procedures

The district where we conducted this study implemented the Reading Street basal. Our content-oriented lessons were aligned to the Reading Street basal, which guided the selection of the texts used in our study and the instructional activities. In addition, prior research suggests that greater alignment between new innovations and existing programs are likely to enhance teachers’ fidelity of implementation (Desimone, 2003).

1. Description of book selection. To select books for this study, the second author identified approximately 500 texts (75% fiction, 25% non-fiction) from which 3rd grade students were matched on reading level and interest. The selections were based on a Scholastic children’s

books catalog for grades 2-4. Particular attention was given to the district's Reading Street basal, using the 3rd grade reading units as a basis for "big idea" categories. These included Dollars and Sense, Smart Solutions, People and Nature, Culture, and Freedom. Each category's major questions (e.g. how to solve problems, how people and nature are connected) lent themselves well to selecting books of various genres of fiction and non-fiction texts, such as adventure, biography, animals, history, humor, and mystery. In addition, titles selected from the book list were based on previous studies on summer book reading were also used as a baseline in building the current list, popular titles matched to children in the site where the study was conducted, and teacher and librarian recommendations.

Lexile scores were used as the primary measure of text difficulty, and the texts used in our study had Lexiles that ranged from 0-1070, a broad range that covered early readers to more advanced chapter books. Content of the texts was examined to ensure age-appropriateness across the entire list. Within each 100 Lexile point range, attention was given to maintaining the ratio of fiction to non-fiction books and a variety of genres. This assured that a student at any Lexile level would have the opportunity to be matched to high-interest fiction and non-fiction texts with a wide range of topics. In the children's survey and reading lessons, we used the terms fiction books and non-fiction rather than narrative and information text. Although there is an imperfect overlap between these two constructs (e.g., narrative text features are sometimes found in non-fiction books), the terms fiction and non-fiction were familiar to the children in the study. Previous studies have used the frequency of fiction and non-fiction book reading as proxies for exposure to narrative and informational text (Guthrie et al., 2007; National Endowment of the Arts, 2004). Fiction books included high-interest series books that included a story grammar (Stein & Glenn, 1979) involving characters, settings, plots, problems, resolutions, and themes

(e.g., Amber Brown, Captain Underpants, Goosebumps). Non-fiction books included texts about animals (e.g., Polar Bears, Penguins) historical figures (Duke Ellington, Roberto Clemente), and natural science (e.g., Awesome Ocean Records). Each informational text included one or several expository text structures including description, sequence, cause and effect, compare and contrast, or problem and solution (Meyer, 1985).

2. Summer book reading and text characteristics analyses. During the summer months, children received books and postcards through mail. We compared the text characteristics of the 10 matched books that children received during the summer months. In the first mailing, all children received the same narrative and expository texts used in the classroom lessons. Thus, the first two summer books were scaffolded by teacher lessons, and the mean child Lexile (592L) was above the Lexile for the narrative text *Jeremy Bean* (420L) and below the Lexile for the expository text *Polar Bears* (660L). After receiving the 2 lesson books, each child also received 8 books that were matched to his/her reading level and interests based on the pretest comprehension score and reading preference survey. TableAA displays descriptive statistics for the text characteristics of the books that were mailed to children in the content and strategy lesson conditions. In both conditions, children were matched to a mean of 7 narrative texts and a mean of 3 informational texts. There were no statistically significant differences in the text characteristics (i.e., Lexile level of books, mean sentence length, mean log word frequency, and the mean word count) of the 8 books mailed to children in each condition.

(Table 2)

3. Training procedures for the content and strategy lessons. Lesson books were selected with several criteria in mind: high-interest, not commonly known and read by students, appropriate text difficulty, and richness and complexity of content for instructional purposes.

Lesson books were selected to illustrate different types of narrative and expository texts students might encounter in their summer books. In particular, 2 expository texts were used to highlight different formats and text features. For example, Polar Bears was structured much like a narrative, with no chapters, while The Sweaty Book of Sweat was divided into chapters and had a table of contents, index, glossary, captions, and other common non-fiction text features.

Teachers in both lesson conditions used the same narrative text (*Look Out, Jeremy Bean*, Schertle, 2011) and the same informational texts (*Polar Bears*, Gibbons, 2002; *The Sweaty Book of Sweat*, Barnhill, 2009). Teachers for both the content and strategy groups attended a 2-hour training session, during which they received 6 lesson plans and materials. Teacher trainers walked them through the lesson procedures, modeling lessons and answering questions. Teachers were given the opportunity to ask follow-up questions up until and during the week of lessons via email and phone.

Content Lessons. In the content condition, training was led by two veteran teachers in the North Carolina district, including a National Board Certified teacher and an instructional coach. The board certified teacher implemented a pilot version of the content lessons in a 2010 pilot study involving third-grade students in her classroom, so she was familiar with the theory and goals of the content lessons.

In our comprehension routine, the two teacher trainers introduced the goals of the content lessons. They explained that the lessons were designed to draw students' attention to structural differences between narrative and expository texts, use different tools to identify structural features unique to each type of text, and motivate engagement with text during reading activities. For story impressions, the accuracy of the guess was not as critical as encouraging engagement with text and deeper comprehension (Anderson & Pearson, 1984; Pearson & Johnson, 1978. A

critical difference between the narrative and expository routine in the content lessons was the amount of book-specific scaffolding that a child received. Because story impression words are specific to the text that a child is reading, each narrative book included a postcard and a book-specific story impression. The second author trained research assistants who generated 356 story impressions for each of the narrative texts. For the expository texts, children were prompted to use the KWL chart to activate background knowledge and to integrate it with text-based information.

Strategy Lessons. In the strategy condition, training was led by two veteran teachers who co-designed lessons in two previous experiments. During training, teachers learned how to implement three lessons involving comprehension strategies for reading the narrative text and the two informational texts, and instructed children to use a simple postcard to answer questions about their books. For the postcard activity involving fiction books, teachers read aloud from the lessons books and instructed children to write down the book title, and indicate whether they finished the book, how many times they read the book, and whether they used comprehension strategies to better understand the book, including re-reading, making predictions, asking questions, and making connections (text to text, text to self). Next, children were instructed to tell someone in their family what the book was about. Then they were instructed to select a 100-word excerpt from the book and to read aloud to a family member. After reading the text a second time, children were instructed to ask a family member whether they read the text more smoothly, knew more words, and read with more expression and obtained a signature from the family member after the second reading. In the postcard for non-fiction books, children were asked whether they used the four comprehension strategies, and to tell someone in their family about 2 things they learned and one question they still had after reading the book.

4. Implementation of classroom lessons. During the last two weeks of school, children participated in 6 comprehension lessons that focused either on content or strategy approaches to comprehension. We assessed the percentage of lesson components that were adhered to by teachers implementing content- and strategy-oriented comprehension lessons. We fit a multi-level model with school-level random effects to compare adherence scores. Our results indicate that the mean adherence rate among teachers implementing content (74%) and strategy lessons (70%) was statistically equivalent (Coefficient = .037, SE = .05, $p = .457$).

In addition to measures of lesson adherence, we also assessed measures of discourse to assess whether the longer content-oriented lessons produced more total talk and more student talk as a percentage of total talk. Descriptive statistics for measures of total talk, child talk, teacher talk, and the ratio of child or teacher talk, are displayed in Table 3. Inspection of the data suggests that there was more total talk, by children and teachers, in the one randomly sample content lesson classroom. As shown in Table 3, there was significantly more total talk ($d = .97$), child talk ($d = .52$), and teacher talk ($d = .88$) in content lessons than strategy lessons. There were no group differences, however, the ratio of child to total or teacher to total talk. These implementation data suggest that most teachers were able to adhere to most of the required lesson components in the content- and strategy-oriented lessons and there were no significant differences in adherence rates in the two conditions. Finally, the discourse measures indicate that the longer content-oriented produced more teacher talk than the strategy-oriented lessons, which was consistent with our expectation that the longer content-oriented lessons would require more teacher-directed talk to guide children through a narrative and informational comprehension routine.

(Table 3)

Results

Treatment Effect Analyses on Reading Comprehension

Question 1: Compared to strategy lessons, what is the impact of content lessons on standardized measures of narrative and expository comprehension? During the second week of September (i.e., beginning of fourth-grade), all children participated in posttests which were used to estimate impacts on comprehension. In our multi-level models, we include fixed-effects for school poverty, pretest reading scores, and lesson condition, and random-effects to account for the clustering of children within classrooms and classrooms within schools. We standardized all pretest and posttest measures and used z-scores in our impact analyses. Thus, the coefficient for the treatment effect can be interpreted as the standardized mean difference between students who received content or strategy lessons. We fit the following mixed effect model

$$Y_{ijk} = \gamma_{00} + \gamma_{01}(\text{Pretest ITBS})_k + \gamma_{02}(\text{School Poverty})_k + \gamma_{03}(\text{Condition})_k + (\mu_k + \delta_{jk} + \varepsilon_{ijk}), \quad (1)$$

where Y_{ijk} represents the posttest score of student i in classroom j in school k , and Pretest ITBS and School Poverty represent covariates that were included to improve the precision of the estimated treatment effect on the coefficient γ_{03} , which captures the estimated difference in posttest scores between students participating in content or strategy lessons. The baseline covariates and the dummy variable for condition were modeled as fixed effects and the school- (μ_k), classroom- (δ_{jk}) and student-specific error terms (ε_{ijk}) were modeled as random effects.

Using the mixed effects model (1), we estimated short-term effects measured in the fall of fourth-grade on total comprehension and narrative and expository comprehension. The impact estimates on each of the three posttest comprehension outcomes are displayed in Table 3. As shown in column 1, there was a positive but non-significant impact on total comprehension scores ($d = .08$). The impact estimates in columns 2 and 3 revealed a positive and statistically

significant impact on narrative text comprehension ($d = .11$) and no impact on expository text comprehension ($d = .00$).

(Table 4)

Treatment Effect Analyses on Reading Engagement With Books at Home

Question 2: Compared to strategy lessons, what is the impact of content lessons on multiple measures of reading engagement, including (a) the number of postcards children reported during summer vacation, (b) the kinds of interactions that children engaged in while reading narrative and informational text, and (c) overall measures of book reading?

Postcard Data. To assess the amount of children's summer book reading activities using a real-time behavioral measure, we compared postcard return rates based on children's experimental condition. Table 5 provides a cross-tabulation of the number and percentage of postcards returned by condition. The first analysis compared participation rates by examining the percentage of children who reported at least 1 postcard. A Kruskal-Wallis test revealed that a larger percentage of children in the strategy condition (63%) than children in the content condition (54%) returned at least 1 postcard, $\chi^2(2, 981) = 8.247, p < .01$. The second analysis focused on the number and percentage of postcards returned using a continuous 0-1 measure. A Kruskal-Wallis test revealed a significant relationship by condition and postcard return rates, $\chi^2(2, 977) = 5.519, p < .05$. Approximately 33% of the children in the strategy condition and 28% of the children in the content condition also returned 5 or more postcards. The postcard return rates are in line with Kim and White's (2008) results, which indicated that 49% of children in the strategy condition reported at least 1 postcard and 23% returned half or more of their postcards. Follow-up analyses based on postcard return rates also shed light on the differences between participants (returned at least 1 postcard) and non-participants (returned 0 postcards). More

precisely, participants scored .52 standard deviations higher on baseline comprehension than non-participants, suggesting that participation rates were higher among high-scoring children than low-scoring children.

(Table 5)

Posttest Survey Data on Children's Interaction with Text. To further probe the qualitative differences in children's interaction with narrative and informational text, we compared posttest survey measures by lesson condition. Table 6 displays descriptive statistics on the number and percentage of children who reported a specific interaction during summer book reading. A significantly larger percentage of children in the content-oriented lesson condition than the strategy condition reported making a story guess before reading narrative text (64%) and checking their story guess after reading the story (70%). However, a larger percentage of the children in the strategy condition than content condition reported using the comprehension strategies (making connections, re-reading, asking questions). For informational text, there were no differences between the two lesson conditions on each of the 9 book-interaction measures. As a final measure of reading engagement, children were asked whether the books they read in the summer were "too hard, just right, or too easy." Descriptive statistics indicate that 84% of the children in the content condition reported that the books they read in the summer were "just right" compared to 69% of the children in the strategy condition, $\chi^2(1, N = 736) = 11.12, p < .001$. In sum, these results indicate that a significantly larger percentage of children in the content condition than strategy condition (a) used the story impression routine with narrative text, and (b) reported reading just right books during the summer; however, a larger percentage of children in the strategy condition than content condition reported using comprehension strategies with narrative text.

(Table 6)

Posttest Survey Data on Children's Summer Book Reading Activities. To assess children's summer book reading habits, we estimated the mean number of books that children reported reading overall and the number of books that were obtained from the public library and purchased at a book store. As shown in Table 7, Kruskal-Wallis tests revealed no differences in summer book reading activities by condition on each of the three book reading measures. In addition, as shown in Table 8, there was no relationship between lesson condition and two measures of parent and family involvement in home book reading. It also appears that parents and family members were more likely to encourage children to read almost every day (55%) than to help children read books every day (22%). In sum, these findings suggest that no difference between lesson conditions on children's self-reported book reading activities.

(Table 7, Table 8)

Discussion

The purpose of this cluster randomized experiment was to compare two approaches to comprehension instruction. In content-oriented lessons, teachers instructed children to apply two comprehension routines, one with narrative texts and one with informational texts in 6 classroom lessons. In strategy-oriented lessons, teachers instructed children to apply a one comprehension routine that was applied to both narrative and informational text. During summer vacation, children in both lesson conditions were mailed 2 lesson texts and 8 books matched to their reading level and interest, and each book also included a postcard that prompted children to continue using the routines learned in class. Results from a school-level random effects model indicated that children in the content-oriented lessons outperformed children in the strategy-oriented lessons on narrative comprehension ($d = .11$), but not on measures of expository

comprehension ($d = .00$) or reading comprehension total ($d = .07$). Survey and postcard data analyses shed light on the positive effects that were observed on the narrative comprehension measure. Compared to children in the strategy-oriented lessons, children in the content-oriented lessons were more likely to apply the before and after story impression routine with narrative text and report that their books were well-matched to their reading level. Since there were no differences between lesson conditions in the amount of book reading or parent and family engagement with books at home, we can reasonably rule out the likelihood that differences in print exposure or parent and family engagement with books were driving the posttest impact on narrative comprehension.

These findings advance literacy research and practice in several ways. First, our results suggest that content-oriented instruction can improve performance on standardized measures of narrative reading comprehension. Previous intervention work has demonstrated moderate to large effects on researcher-designed comprehension measures (McKeown, Beck, Ronette, 2009; Williams et al., 2002). Our theory of change, outlined in Figure 1, guides the interpretation of the impact on narrative comprehension. In the narrative routine, teachers focused children's attention on the content of text by modeling how to make a guess using words drawn from the text, by asking questions based on narrative text structures, and by checking the story guess using actual information from the story. In the informational text routine, teachers focused children's attention on the content of text by modeling how to activate background knowledge and ask questions about a topic, by discussing questions based on expository text structures, and by checking new content. The routines were designed to promote transfer to home settings through prompts in a reading postcard that was included with each of the 10 books. Consistent with this goal, our survey data suggest that a significantly larger percentage of children in the

content condition than strategy condition reported making a story guess and checking the guess with the actual story. Because each narrative text included a book-specific story impression routine, there was clearly more individualized support for each narrative text. The combination of the story impression words, the activation of background knowledge that is focused around text-based content, and the post-reading confirmation of the story guess may work together to enable children to form a coherent representation of text (Kintsch, 1994). In other words, the narrative routine may be an efficient and effective approach for helping children integrate the story impression words with text-based ideas during independent book reading.

Second, the results raise questions about why content-oriented lessons improved narrative but not expository comprehension. The most obvious answer is that children were matched to an average of 2 informational texts and 8 narrative texts. Thus, there was clearly less exposure to informational texts, which also include more unfamiliar text structures than narrative texts (Hiebert & Sailors, 2009; Stein & Glenn, 1979; Rumelhart, 1977, Meyer, 1985). In addition, the informational text lessons were based on the KWL routine, which may not be an effective tool for improving expository text comprehension. Researchers and practitioners have noted that interactive discussions designed to activate children's background knowledge prior to reading expository text may lead to unfocused class discussions about irrelevant and inaccurate information about text (Alvermann et al., 1985; Dole et al. 1991; Lemov, 2010). Evidence from our lesson transcripts suggest that the KWL routine was not an effective tool for activating background knowledge and improving text comprehension. When asked what you "K"now about a topic and what you "W"ant to know, many children in our study had limited background knowledge and asked questions about minor and peripheral details. It is clear that the narrative comprehension routine based on a story impression was a stronger scaffold than the KWL

routine in promoting reading engagement at home during the summer. Thus, the more individualized scaffolding provided by the narrative routine compared to the informational text routine may have translated into larger gains in narrative comprehension than expository comprehension outcomes. Clearly, children need an equally useful instructional tool to scaffold an understanding of the macrostructure—i.e., the main ideas—in expository text. Given the limitations with the informational text routine used in our study, future work should include longitudinal studies that increase opportunities to read expository text, and include instructional routines that focus on the macrostructure of expository text (i.e., understanding the main idea).

Limitations and Implications for Research and Practice

There are several other study limitations that should inform future research. Despite the importance of a cluster randomized trial as an evaluation tool, our study was not designed to identify the precise before, during, and after reading routines that improved reading comprehension outcomes. For example, our study was not designed to isolate the effects of either the classroom lessons or the story impression routine on narrative comprehension. It is also difficult to explain why content approaches were more effective than strategy approaches given the differences in participation rates. In particular, a significantly larger percentage of children in the strategy condition (63%) returned at least 1 postcard compared to children in the content condition (54%). These results raise an important dilemma. On one hand, it appears that the content-oriented routines improved narrative reading comprehension but did not increase the number of participating students relative to the strategy-oriented routine. On the other hand, the strategy-oriented routine promoted broader participation in the voluntary book reading activities during summer but did not improve comprehension relative to the content-oriented routines. As a result, these findings imply that content-oriented lessons may be more effective in improving

skills but less effective in encouraging participation than our strategy-oriented lessons. Perhaps, then, one idea is to implement school-based literacy events that enable parents to support and encourage their children's book reading activities throughout the summer months.

We close by encouraging researchers to focus on testing the effects of instructional activities and comprehension routines in the context of summer reading interventions. To date, most voluntary summer reading interventions have randomly assigned books or other resources that indirectly affect comprehension (Allington et al., 2010; Kim & White, 2008; McCombs et al., 2011; Wilkins et al., 2012). In future work, researchers should undertake more studies that examine whether and how different comprehension lessons and routines affect children's reading engagement and comprehension ability (Cohen, Raudenbush, & Ball, 2003). Given the dearth of experimental work that probes this question, our findings require additional replication.

References

- Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2007). Lasting consequences of the summer learning gap. *American Sociological Review*, 72, 167-180.
- Allen, L., Cipielewski, J., & Stanovich, K. E. (1992). Multiple indicators of children's reading habits and attitudes: Construct validity and cognitive correlates. *Journal of Educational Psychology*, 84, 489-503.
- Allington, R. L., McGill-Franzen, A., Camilli, G., Williams, L., Graff, J., Zeig, J., & Nowak, R. (2010). Addressing summer reading setback among economically disadvantaged elementary students. *Reading Psychology*, 31(5), 411-427.
- Anderson, J. R. (1995). *Learning and memory: An integrated approach*. New York: Wiley.
- Anderson, R. C., & Nagy, W. E. (1993). The vocabulary conundrum. Washington, DC: Office of Educational Research and Improvement.
- Anderson, R.C., & Pearson, P.D. (1984). "A Schema-Theoretic View of Basic Processes in Reading Comprehension." In P.D. Pearson, R. Barr, M.L. Kamil, & P. Mosenthal (Eds.), *Handbook of Reading Research* (pp. 255-291). New York: Longman.
- Anderson, R. C., Wilson, P. T., & Fielding, L. G. (1988). Growth in reading and how children spend their time outside of school. *Reading Research Quarterly*, 23, 285-303.
- Armbruster, B. B., Anderson, T. H., & Ostertag, J. (1987). Does Text Structure/Summarization Instruction Facilitate Learning from Expository Text? *Reading Research Quarterly*, 22, pp. 331-346.
- Aud, S., Hussar, W., Johnson, F., Kena, G., Roth, E., Manning, E., Wang, X., and Zhang, J. (2012). The Condition of Education 2012 (NCES 2012-045). U.S. Department of Education, National Center for Education Statistics. Washington, DC. Retrieved [date] from <http://nces.ed.gov/pubsearch>
- Becker, B., McElvany, N., & Kortenbruck, M. (2010). Intrinsic and extrinsic reading motivation as predictors of reading literacy: A longitudinal study. *Journal of Educational Psychology*, 102, 773-785.
- Bowey, J. A., & Muller, D. (2005). Phonological recoding and rapid orthographic learning in third-graders' silent reading: A critical test of the self-teaching hypothesis. *Journal of Experimental Child Psychology*, 92, 203-219.
- Bradley, R.H., Corwyn, R.F., McAdoo, H.P., & Coll, C.G. (2001). The home environments of children in the United States Part I: Variations by age, ethnicity, and poverty status. *Child Development*, 72, 1844-1867.
- Bronfenbrenner, U. & Morris, P. A. (1998). In Damon, W. & Lerner, R. M. (Eds.), *Handbook of child psychology: Volume 1: Theoretical models of human development* (5th ed.), (pp. 993-1028). Hoboken, NJ, US: John Wiley & Sons Inc.
- Brynes, J. P. (2000). Using instructional time effectively. In L. Baker, M. J. Dreher & J. T. Guthrie (Eds.), *Engaging young readers* (pp. 188-208). New York: Guilford Press.
- Burkam, D. T., Ready, D. D., Lee, V. E., & LoGerfo, L. F. (2004). Social-class differences in summer learning between kindergarten and first grade: Model specification and estimation. *Sociology of Education*, 77, 1-31.
- California Department of Education. (1999). Reading/language arts framework for California public schools, kindergarten through grade twelve. Sacramento, CA: California Department of Education.
- Carr, E., & Ogle, D. (1987). KWL Plus: A strategy for comprehension and summarization, *Journal of Reading Behavior*, 37, 626-631.

- Carver, R. P., & Leibert, R. E. (1995). The effect of reading library books at different levels of difficulty upon gain in reading ability. *Reading Research Quarterly, 30*, 26-48.
- Ceci, S., & Papierno, P. B. (2005). The rhetoric and reality of gap closing. *American Psychologist, 60*, 149-160.
- Chall, J. S. (1983). *Stages of reading development*. New York: McGraw-Hill.
- Chin, T., & Phillips, M. (2004). Social reproductive and child-rearing practices: Social class, children's agency, and the summer activity gap. *Sociology of Education, 77*, 185-210.
- Cohen, D. K., Raudenbush, S. W., & Ball, D. L. (2003). Resources, instruction, and research. *Educational Evaluation and Policy Analysis, 25*, 119-142.
- Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects. (n.d.). Washington, DC: Council of Chief State School Officers and the National Governors Association for Best Practices.
- Connor, C. M., Pitasta, S. B., Fishman, B., Glasney, S., Schatschneider, C., Crowe, Underwood, P., & Morrison, F. J. (2009). Individualizing student instruction precisely: Effects of child by instruction interactions on first graders' literacy development. *Child Development, 80*, 77-100.
- Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research, 66*, 227-268.
- Cunningham, A. E., & Stanovich, K. E. (1990). Assessing print exposure and orthographic processing skill in children: A quick measure of reading experience. *Journal of Educational Psychology, 82*, 733-740.
- Cunningham, A. E., & Stanovich, K. E. (1991). Tracking the unique effects of print exposure in children: Association with vocabulary, general knowledge, and spelling. *Journal of Educational Psychology, 83*, 264-274.
- Cunningham, A. E., & Stanovich, K. E. (1998). What reading does for the mind. *American Educator, 22*, pp. 8-15.
- Daane, M. C., Campbell, J. R., Grigg, W. S., Goodman, M. J., & Oranje, A. (2005). Fourth-grade students reading aloud: NAEP 2002 special study of oral reading (NCES 2006-469). Washington, DC: U. S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.
- Desimone, L. (2003). How can comprehensive school reform models be successfully implemented? *Review of Educational Research, 72*, 433-479
- Dole, J. A., Valencia, S. W., Greer, E. A., & Wardrop, J. A. (1991). Effects of two types of prereading instruction on the comprehension of narrative and expository text. *Reading Research Quarterly, 26*, 142-159.
- Downey, D.B., von Hippel, P.T., & Broh, B.A. (2004). Are schools the great equalizer? Cognitive inequality during the summer months and the school year. *American Sociological Review, 69*, 613-635.
- Duke, N. (2000). 3.6 minutes per day: The scarcity of informational texts in first grade. *Reading Research Quarterly, 35*, 202-224.
- Duke, N., & Pearson, D. (2002). Effective practices for developing reading comprehension. In A. Farstrup & J. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed.) (pp. 205-242). Newark, DE: International Reading Association.
- Duke, N., & Pearson, D. (2011). Essential elements of fostering and teaching reading

- comprehension. In A. Farstrup & J. Samuels (Eds.), *What research has to say about reading instruction* (4th ed.) (pp. 51-93). Newark, DE: International Reading Association.
- Englert, C. S., Hiebert, E. (1984). Children's developing awareness of text structures in expository materials. *Journal of Educational Psychology*, 76, 65-74.
- Entwisle, D. R., Alexander, K. L., & Olson, L. S. (2000). Summer learning and home environment. In R. D. Kahlenberg (Ed.), *A notion at risk* (pp. 9-30). New York: The Century Foundation Press.
- Fountas, I. C., & Pinnell, G. S. (2006). *Teaching for comprehending and fluency: Thinking, talking, and writing about reading, K-8*. Portsmouth, NH: Heinemann.
- Fry, E. (2002). Readability versus leveling. *Reading Teacher*, 56, 286-291.
- Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading*, 5, 241-258.
- Goldenberg, C., Rueda, R. S., & August, D. (2006). *Sociocultural influences on the literacy attainment of language-minority children and youth*. In D. August & T. Shanahan (Eds.), *Developing literacy in second-language learners: Report of the national literacy panel on language minority children and youth* (pp. 269-318). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7, 6-10.
- Graesser, A. C., McNamara, D. S., Kuliowich, J. M. (2011). Coh-matrix: Providing multilevel analyses of text characteristics. *Educational Researcher*, 40, 223-234.
- Graves, M. F., Cooke, C. L., & Laberge, M.J. (1983). Effects of previewing short stories. *Reading Research Quarterly*, 18, 262-276.
- Guthrie, J.T., & Humenick, N.M. (2004). Motivating students to read: Evidence for classroom practices that increase reading motivation and achievement. In P. McCardle & V. Chabra (Eds.), *The voice of evidence in reading research* (pp. 329-354). Baltimore: Paul H. Brookes.
- Guthrie, J. T., Wigfield, A., Barbosa, P. Perencevich, K. C., Taboada, A., Davis, M. H., Scaffidi, N. T., & Tonks, S. (2004). Increasing reading comprehension and engagement through concept-oriented reading instruction. *Journal of Educational Psychology*, 96, 403-423.. Reading motivation and reading comprehension growth in the later elementary years. *Contemporary Educational Psychology*, 32, 282-313.
- Hayes, D. P., & Ahrens, M. (1988). Vocabulary simplification for children: A special case of 'motherese'. *Journal of Child Language*, 15, 395-410.
- Heyns, B. (1978). *Summer learning and the effects of schooling*. New York: Academic Press, Inc.
- Hiebert, E. H., & Sailors, M. (2009). *Finding the right texts: What works for beginning and struggling readers*. New York: Guilford Press.
- Hofferth, S. L., & Sandberg, J. F. (2001). How american children spend their time. *Journal of Marriage and Family*, 63, 295-308.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, 80, 437-447.
- Just, M. A., & Carpenter, P. A. (1992). A capacity theory of comprehension: Individual differences in working memory. *Psychological Review*, 99, 122-149.

- Kim, J. S. (2006). The effects of a voluntary summer reading intervention on reading achievement: Results from a randomized field trial. *Educational Evaluation and Policy Analysis*, 28, 335-355.
- Kim, J. S. (2007). The effects of a voluntary summer reading intervention on reading activities and reading achievement. *Journal of Educational Psychology*, 99, 505-515.
- Kim, J. S., & White, T. G. (2008). Scaffolding voluntary summer reading for children in Grades 3 to 5: An experimental study. *Scientific Studies of Reading*, 12, 1-23.
- Kintsch, W. (1994). Text comprehension, memory, and learning. *American Psychologist*, 49, 294-303.
- Lareau, A. (1989). *Home advantage: Social class and parental intervention in elementary education*. New York: The Falmer Press.
- Lemov, D. (2010). *Teach like a champion*. San Francisco, CA: Jossey-Bass.
- Lindsay, J. (2010). *Children's access to print material and education-related outcomes: Findings from a meta-analytic review*. Naperville, IL: Learning Point Associates.
- Maria, K., Hughes, K. E., MacGinitie, W. H., MacGinitie, R. K., & Dreyer, L. G. (2007). *Lexile conversions for the Gates-MacGinitie reading tests, 4th edition*. Rolling Meadows, IL: Riverside Publishing.
- McGinley, W.J., & Denner, P.R. (1987). "Story Impressions: A Prereading/Writing Activity." *Journal of Reading*, 31, 248-253.
- McKenna, M. C., & Kear, D. J. (1990). Measuring attitude toward reading: A new tool for educators. *The Reading Teacher*, 43, 626-639.
- McKeown, M. G., Beck, I. L., & Blake, R. G. K. (2009). Rethinking reading comprehension: A comparison of instruction for strategies and content approaches. *Reading Research Quarterly*, 44, 218-253.
- McLloyd, V. (1979). The effects on extrinsic rewards of differential value on high and low intrinsic interest. *Child Development*, 50, 1010-1019.
- Meichenbaum, D., & Biemiller, A. (1998). *Nurturing independent learners*. Cambridge, MA: Brookline Books.
- Mesmer, H. A. E., & Cumming, S. (2009). Text-reader matching: Meeting the needs of struggling readers. In E. H. Hiebert & M. Sailors (Eds.), *Finding the right texts* (pp. 149-177). New York: Guilford Press.
- Mesmer, H. A. E., Cunningham, J. W., & Hiebert, E. H. (2012). Toward a theoretical model of text complexity for the early grades: Learning from the past, anticipating the future. *Reading Research Quarterly*, 47, 235-258.
- Meyer, B. J. F. (1985). Prose analysis: Purposes, procedures, and problems. In B. K. Britton & J. B. Black (Eds.), *Understanding expository text: A theoretical and practical handbook for analyzing explanatory text*. Hillsdale, NJ: Erlbaum.
- Mol, S. E. & Bus, A. (2011). To read or not to read: A meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin*, 137, 267-296.
- Nagy, W. E., Anderson, R. C., & Herman, P. A. (1987). Learning word meanings from context during normal reading. *Reading Research Quarterly*, 24, 237-270.
- Nagy, W. E., & Scott, J. A. (2000). Vocabulary processes. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson & R. Barr (Eds.), *Handbook of reading research*. Mahwah, NJ: Erlbaum.
- National Endowment of the Arts. (2004). *Reading at risk: A survey of literary reading in America*. Washington, DC: NEA.

- National Reading Panel. (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. Washington, DC: National Institute of Child Health and Human Development.
- Neuman, S. B., & Celano, D. (2001). Access to print in middle- and low-income communities: An ecological study of four neighborhoods. *Reading Research Quarterly*, 36, 8–26.
- O'Brien, D. M. (1999). Three essays on early academic achievement of minority and disadvantaged students. Unpublished Dissertation for the Degree of Doctor of Philosophy in Political Economy, The University of Texas at Dallas, Dallas.
- O'Connor, R., Bell, K. M., Harty, K. R., Larkin, L. K., Sackor, S. M., & Zigmond, N. (2002). Teaching reading to poor readers in the intermediate grades: A comparison of text difficulty. *Journal of Educational Psychology*, 94, 474-485.
- Ogle, D. M. (1986). K-W-L: A teaching model that develops active reading of expository text. *Reading Teacher*, 39, 564-570.
- Pearson, P. D., & Fielding, L. (1991). Comprehension instruction. In R. Barr, M. L. Kamil, P. B. Mosenthal & P. D. Pearson (Eds.), *Handbook of reading research, volume II* (pp. 815-860). New York: Longman.
- Pearson, P. D., & Gallagher, M. C. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology*, 8, 317-344.
- RAND Reading Study Group. (2002). *Reading for understanding*. Santa Monica, CA: RAND.
- Rasch, G. A. (1980). *Probabilistic models for some intelligence and attainment tests*. Chicago: University of Chicago Press.
- Renninger, A. K. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 373–404). San Diego, CA: Academic Press.
- Reynolds, P. L., & Symons, S. (2001). Motivational variables and children's text search. *Journal of Educational Psychology*, 93, 14–23.
- Rosenshine, B., & Meister, C. (1994). Reciprocal teaching: A review of the research. *Review of Educational Research*, 64, 181-221.
- Rosenshine, B., Meister, C., & Chapman, S. (1996). Teaching students to generate questions: A review of the intervention studies. *Review of Educational Research*, 66, 181-221.
- Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioral research: Methods and data analysis (2nd ed.)*. New York: McGraw-Hill.
- Rumelhart, D. E. (1977). Understanding and summarizing brief stories. In D. La Berge & S. J. Samuels (Eds.). *Basic processes in reading: Perception and comprehension*. Hillsdale, NJ: Erlbaum.
- Schiefele, U. (1999). Interest and learning from text. *Scientific Studies of Reading*, 3(3), 257–279.
- Schnick, T., & Knickelbine, M. (2000). *The lexile framework, an introduction for educators*. Durham, NC: Metametrics, Inc.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton Mifflin Company.
- Shanahan, T., Callison, K., Carriere, C., Duke, N. K., Pearson, P. D., Schatschneider, C., & Torgesen, J. (2010). *Improving reading comprehension in kindergarten through 3rd grade: A practice guide* (NCEE 2010-4038). Washington, DC: National Center for

- Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from whatworks.ed.gov/publications/practiceguides.
- Snow, C. E., & Biancarosa, G. (2003). Adolescent literacy and the achievement gap: What do we know and where do we go from here? New York: Carnegie Corporation of New York.
- Stahl, S. A. (2004). What do we know about fluency? Findings of the National Reading Panel. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pp. 187-212). Baltimore: Paul H. Brookes Publishing Co.
- Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York: Guilford Press.
- Stein, N. L., & Glenn, C. G. (1979). An analysis of story comprehension in elementary school children. In R. D. Freedle (Ed.), *Advances in discourse processes: Vol. 2. New directions in discourse processing*. Norwood, NJ: Ablex.
- Swanborn, M. S. L., & de Glopper, K. (1999). Incidental word learning while reading: A meta-analysis. *Review of Educational Research*, 69, 261-285.
- Tharp, R. G., & Gallimore, R. (1988). *Rousing minds to life: Teaching, learning, and schooling in social context*. Cambridge, UK: Cambridge University Press.
- U. S. Department of Education. (2001). Assessing the lexile framework: Results of a panel meeting, NCEES 2001-08. Washington, DC: U. S. Department of Education, National Center for Education Statistics.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: The MIT Press.
- Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89, 420-432.
- Wilkins, C., Gersten, R., Decker, L., Grunden, L., Brasiel, S., Brunnert, K., and Jayanthi, M. (2012). *Does a summer reading program based on Lexiles affect reading comprehension?* (NCEE 2012-4006). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
- Wilkins, C., Hartman, J., Howland, N., & Sharma, N. (2010). *How prepared are students for college-level reading? Applying a Lexile®-based approach*. (Issues & Answers Report, REL 2010–No. 094). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. Retrieved July 3, 2012, from <http://ies.ed.gov/ncee/edlabs>
- Williams, J. P., Hall, K. M., Lauer, K. D., Stafford, B., DeSisto, L. A., & deCani, J. S. (2005). Expository text comprehension in the primary grade classroom. *Journal of Educational Psychology*, 97, 538-550.
- Williamson, G. L. (2008). A text readability continuum for postsecondary readiness. *Journal of Advanced Academics*, 19, 602-632.
- Wright, B. D., & Stone, M. H. (2004). *Making measures*. Chicago: The Phanon Press, Inc.

Figure 1

Logic model describing key proximal processes and constructs measured over time

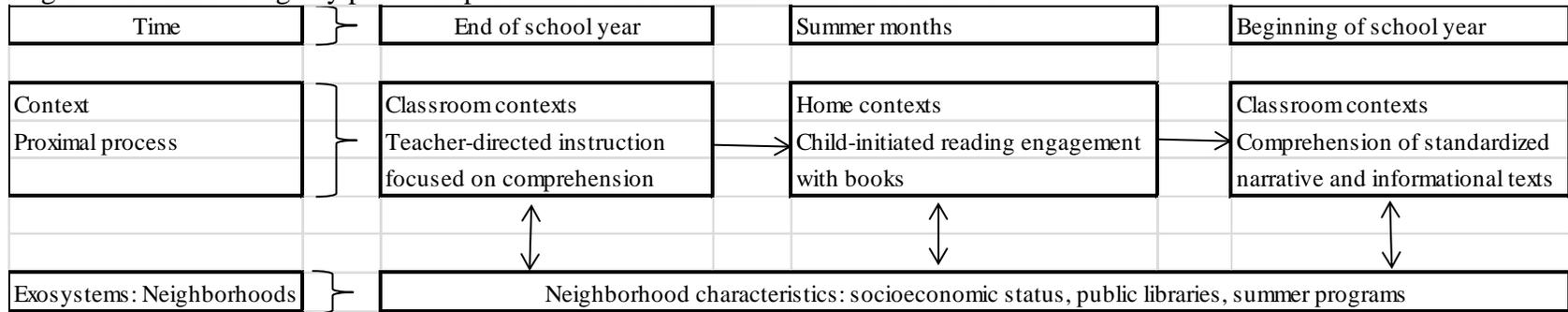


Table 1
Pretest Demographic Characteristics of Children in the Final Sample (N = 981)

Characteristic	%	M	SD
Child			
% female		48	
% low-income (eligible for free lunch)		73	
% White		15	
% Black		49	
% Latino		32	
% Asian		2	
% Multiracial		2	
% Limited proficient with English		30	
Reading comprehension (NPR)		45	29
Reading comprehension (Lexile)		592	187
Neighborhood characteristics (census tracts)			
% bachelors degree or higher		46	20
% below poverty line		11	6
% of males in labor force		73	4
% employed in professional positions		43	9

Note. NPR = National Percentile Rank

Table 2
Text Characteristics of Summer Books, by Condition

Text characteristic	Content Lessons					Strategy Lessons				
	n	M	SD	Min	Max	n	M	SD	Min	Max
Child Lexile	447	585.86	184.58	150.00	1100.00	501	597.98	189.52	110.00	1100.00
Narrative texts	461	7.04	2.43	1.00	9.00	520	6.92	2.48	1.00	9.00
Expository texts	461	2.96	2.43	1.00	9.00	520	3.08	2.48	1.00	9.00
Lexile (8 matched books)	461	552.63	185.58	11.25	990.00	520	566.76	184.85	27.50	990.00
Mean sentence length (8 matched books)	461	8.39	2.30	2.41	16.88	520	8.63	2.40	3.01	16.88
Mean log word frequency (8 matched books)	461	3.26	0.56	0.88	3.80	520	3.29	0.50	1.00	3.80
Mean word count (8 matched books)	461	10639.41	9000.21	229.88	46497.00	520	11174.17	9102.42	326.13	48750.50

Table 3
Classroom Discourse Measures (Child and Teacher Talk), by Lesson Condition

Variable	Content (n = 26)		Strategy (n = 25)		Total (n = 51)		t	p
	M	SD	M	SD	M	SD		
Total talk	4735	1556	3439	1108	4100	1493	3.42	0.001
Child talk	621	472	389	422	507	459	1.85	0.071
Teacher talk	4114	1352	3049	1079	3592	1327	3.1	0.003
Child talk/total talk	0.13	0.08	0.11	0.14	0.12	0.11	0.37	0.71
Teacher talk/total talk	0.87	0.08	0.89	0.14	0.88	0.11	0.37	0.71

Table 4
Multi-level Models Used to Predict Reading Comprehension, Narrative, and Expository Comprehension Z-Scores

	Reading Comprehension			Narrative			Expository		
Fixed Effect	Coefficient	SE	z	Coefficient	SE	z	Coefficient	SE	z
Intercept	0.225	0.126	1.79~	0.199	0.101	1.97*	0.211	0.115	1.84~
ITBS pretest	0.881	0.027	33.09***	0.716	0.025	28.87***	0.629	0.028	22.20***
Percent FRL	-0.336	0.169	-1.98*	-0.36	0.138	-2.61**	-0.307	0.157	-1.95~
Condition	0.081	0.059	1.37	0.111	0.048	2.29*	0.002	0.055	0.03
Random Effect	Estimate	SE		Estimate	SE		Estimate	SE	
School	0.064	0.052		0.000	0.000		0.000	0.000	
Teacher	0.000	0.000		0.02	0.294		0.058	0.082	
Residual	0.708	0.018		0.671	0.023		0.759	0.019	

~ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5
Percentage of children Returning 0 to 10 Postcards, by Condition

Category	Strategy (n = 519)	Content (n = 458)	Total (n = 977)
0 postcards	191	211	402
%	36.8	46.07	41.15
1 postcard	42	30	72
%	8.09	6.55	7.37
2 postcards	42	30	72
%	8.09	6.55	7.37
3 postcards	29	30	59
%	5.59	6.55	6.04
4 postcards	44	29	73
%	8.48	6.33	7.47
5 postcards	36	23	59
%	6.94	5.02	6.04
6 postcards	38	17	55
%	7.32	3.71	5.63
7 postcards	25	23	48
%	4.82	5.02	4.91
8 postcards	28	27	55
%	5.39	5.9	5.63
9 postcards	21	17	38
%	4.05	3.71	3.89
10 postcards	23	21	44
%	4.43	4.59	4.5

Table 6
Percentage of children Returning 0 to 10 Postcards, by Condition

Category	Strategy (n = 519)	Content (n = 458)	Total (n = 977)	p	
Narrative Text					
a. I guessed at what would happen in the story before I read it.	64%	70%	67%	0.08	C > S
b. I told someone what happened in the book.	77%	70%	73%	0.04	S > C
c. I explained why something happened in the book.	64%	55%	59%	0.01	S > C
d. I made connections to the book.	76%	56%	66%	0.00	S > C
e. I asked questions about the book.	73%	58%	66%	0.00	S > C
f. I asked why someone did something in the story.	57%	52%	54%	0.27	S = C
g. I reread if I did not understand part of the book.	85%	76%	81%	0.00	S > C
h. I checked if my guesses were the same as the actual story.	56%	70%	62%	0.00	C > S
i. I explained the most important message in the story to someone.	57%	56%	57%	0.72	S = C
Informational Text					
a. I talked to someone about the subject before reading the book.	48%	54%	51%	0.12	S = C
b. I reread parts of the book if I did not understand part of the book.	81%	78%	80%	0.29	S = C
c. I explained why something happened in the book.	63%	61%	62%	0.53	S = C
d. I told someone what I wanted to learn from the book.	57%	59%	58%	0.58	S = C
e. I guessed what the book was about before reading it.	69%	69%	69%	0.93	S = C
f. I told someone what I learned after reading the book.	70%	73%	72%	0.40	S = C
g. I told someone what happened in the book.	73%	74%	73%	0.66	S = C
h. I told someone the questions I still had about a topic.	62%	57%	59%	0.17	S = C
i. I compared two people or things in the book.	54%	51%	53%	0.37	S = C

Table 7

Percentage of Children Reading Between 0-1 book and 10 or More Books, by Condition

Category	Books read total		Books checked out of library		Books purchased from book store	
	Content Lessons	Strategy Lessons	Content Lessons	Strategy Lessons	Content Lessons	Strategy Lessons
0-1 book (%)	4	2	49	43	60	54
2-3 books (%)	10	10	16	18	18	22
4-5 books (%)	17	11	9	13	9	7
6-7 books (%)	13	14	6	7	5	5
8-9 books (%)	13	18	7	5	2	5
10 or more books (%)	42	45	13	14	6	8
6 or more books (%)	68	77	26	26	13	18

Table 8

Frequency Distributions for Parent Encouragement and Support for Home Book Reading, by Condition

Category	Content	Strategy	Total
1. Parents (or someone in family) encouraged reading			
Less than once a month	17	18	17
Once or twice a month	9	11	10
Once or twice a week	17	18	17
Almost every day	57	53	55
2. Parents (or someone in family) helped with book reading			
Less than once a month	42	42	42
Once or twice a month	13	17	15
Once or twice a week	22	21	21
Almost every day	23	20	22