The Effects of an Intensive Shared Book-Reading Intervention for Preschool Children at Risk for Vocabulary Delay

SHAROLYN D. POLLARD-DURODOLA
JORGE F. GONZALEZ
DEBORAH C. SIMMONS
OMAN KWOK
AARON B. TAYLOR
MATTHEW J. DAVIS
MINJUNG KIM
LESLE SIMMONS
Texas A&M University

ABSTRACT: This study examined the effects of an intensive shared book-reading intervention on the vocabulary development of preschool children who were at risk of vocabulary delay. The participants were 125 preschool children, who the researchers stratified by classroom and randomly assigned to one of two shared book-reading conditions (i.e., the experimental, Words of Oral Reading and Language Development [WORLD] intervention; or typical practice). Results on researcher-developed measures of receptive and expressive vocabulary showed statistically and practically significant effects for the WORLD intervention with no differential effects for children with higher vs. lower entry-level vocabulary knowledge. The researchers detected no statistically significant differences on standardized measures of vocabulary. The research suggests that a combination of instructional factors may be necessary to enhance the efficacy of shared book reading for children with early vocabulary difficulties.

Converging evidence documents that children enter school with substantial disparities in the depth and breadth of their vocabulary knowledge. For many children, these disparities transcend time and can have a lasting effect on academic achievement (Catts, Hogan, & Fey, 2003; Hart & Risley, 1995; Snow, Burns, & Griffin, 1998; Van Kleeck, 2008). Although there is
widespread agreement that vocabulary knowledge is important for reading achievement and comprehension, the magnitude and direction of influence is complex.

Longitudinal studies have demonstrated both direct and indirect influences of vocabulary on reading achievement. These influences depend in part on (a) the vocabulary construct (studied independently or as part of a larger language construct); (b) the outcome measure (e.g., word recognition, reading comprehension); and (c) the interval between assessment points (National Institute of Child Health and Human Development, [NICHD] Early Child Care Research Network, 2005; Storch & Whitehurst, 2002). Overall, these studies have evaluated the early vocabulary/oral language–reading comprehension connection over extended periods of time and have provided compelling evidence that vocabulary discrepancies emerge early, relate to later reading-comprehension difficulties, and are stable in the absence of intervention (Catts, Adlof, & Weismer, 2006; Catts, Bridges, Little, & Tomblin, 2008; Catts, Fey, Zhang, & Tomblin, 1999; Hart & Risley, 1995; Storch & Whitehurst, 2002). At issue is how to design and deliver interventions that effectively develop young children’s knowledge of vocabulary that are important for listening comprehension in preschool and that are also significant for subsequent reading comprehension. Such interventions are particularly important for preschool children whose delays in vocabulary knowledge place them at risk of later reading-comprehension difficulties.

THE RELATIONSHIP BETWEEN VOCABULARY, ENVIRONMENT, AND SOCIOECONOMICS

Previous research has found that children most at risk of early oral language and vocabulary delay come from lower-income homes in which socioeconomics may disadvantage children’s educational and experiential opportunities before they enter school (Farkas & Beron, 2004; Hargrave & Sénéchal, 2000; Hart & Risley, 1995; McLoyd, 1998). Although learning disabilities are, by definition, not attributable to educational or experiential opportunity, Shaywitz, Lyon, and Shaywitz (2006) documented an environmentally determined (e.g., lower socioeconomic status [SES], poor quality of instruction at disadvantaged schools) reading disability that has a strong influence on children’s verbal abilities. These findings suggest that a childhood lived in poverty may place a child at high risk for future academic problems. To mitigate the effects of poverty and close the vocabulary gap, interventions must begin early in preschool when the highest rate of vocabulary growth occurs (Farkas & Beron), and they must employ evidence-based practices that reduce learning gaps in language development (National Association for the Education of Young Children [NAEYC], 2009).

CLOSING THE VOCABULARY GAP THROUGH INTENSIVE INTERVENTION

To better understand instructional methods that accelerate vocabulary acquisition in young children who are at risk of verbal delay and later reading-comprehension difficulties, we drew from two related research literatures: (a) current research syntheses of vocabulary practices, and (b) shared book-reading interventions.

CURRENT SYNTHESSES OF VOCABULARY PRACTICES

Two primary syntheses in the previous decade have guided vocabulary instruction for children in preschool through grade 12 and have included specific instructional recommendations for at-risk children (Elleman, Lindo, Morphy, & Compton, 2009; National Reading Panel [NRP], 2000). Findings from these investigations document that at-risk or low-achieving students benefit from instruction that restructures vocabulary tasks (e.g., scaffolding) to facilitate deep processing of activities (NRP), and these investigations included explicit discussions of target words to strengthen and develop background knowledge (Elleman et al.).

The following practices were effective for children, regardless of vocabulary level: (a) explicit vocabulary instruction; (b) frequent exposures to vocabulary across multiple contexts; and
integration of definitional and contextual approaches in which words learned come from content materials (e.g., science, social studies). Although these findings are important, their basis is primarily studies of children in grades 3 and above, leaving a gap in knowledge about specific methods for developing and accelerating the vocabulary of young at-risk children.

**Shared Book-Reading Research**

The primary research base that guides vocabulary intervention in young children is shared book reading (Ezell & Justice, 2005; Hargrave & Sénéchal, 2000; Whitehurst & Lonigan, 1998). Shared book reading is a general practice that involves an adult reading a book to a child or group of children and encompasses a range of methods that vary in complexity and focus (What Works Clearinghouse [WWC], 2006). Interactive shared book reading is among the most commonly investigated book-reading methods (National Early Literacy Panel [NELP], 2009).

Although interactive book-reading methods may vary, they share a common purpose, which is to strategically and actively engage children in telling the story and discussing its characters, events, and vocabulary. As an example, dialogic reading is a type of interactive book-reading method with structured supports and scaffolds that an adult reader furnishes. The adult reader reads a book, asks questions of one or more children about a story or storybook pictures, and attends to the children’s oral responses with feedback (Lonigan, Shanahan, & Cunningham, 2008).


Shared book-reading meta-analyses reported findings of smaller magnitude for studies conducted with children with early reading risk than for studies conducted with children who were not at risk. Studies that incorporated methods of interactive reading with at-risk children had a greater impact than methods that did not. To better understand the nature of dialogue and interaction associated with improved vocabulary outcomes, we reviewed primary studies that focused on preschool children at risk of vocabulary delay.

We identified at least 12 studies conducted over the past 15 years that specifically investigated the effects of shared book-reading interventions on the vocabulary development of at-risk preschool children in Head Start or in subsidized child-care settings. Collectively, these studies used shared book reading, with varying degrees of interactive reading, to optimize language and literacy outcomes in this population of children. Of the primary studies that were more interactive than others, three had no significant effect on receptive vocabulary (Lonigan, Anthony, Bloomfield, Dyer, & Samwell, 1999; Lonigan & Whitehurst, 1998; Whitehurst et al., 1994), and one study demonstrated a statistically significant effect for pretest to posttest growth on expressive vocabulary knowledge (Lonigan et al., 1999).

Interactive shared book-reading interventions with the strongest effects for children with low vocabulary extended opportunities for explicit discussions and target word use before, during, and after book reading and throughout the preschool day (Wasik & Bond, 2001; Wasik, Bond, & Hindman, 2006). In these studies, the authors had organized the book content around familiar themes (e.g., seasons) with results indicating that at-risk children scored higher than children in comparison conditions on standardized measures of receptive and expressive vocabulary knowledge (Wasik & Bond; Wasik et al.). However, although significant differences existed between experimental and control conditions on standardized measures, treatment children’s vocabulary levels remained below national norms.

Shared book-reading studies with at-risk children have also focused on the distribution of interactions (i.e., before, during, or after book reading). Findings from these studies document...
that at-risk children benefit from both before-reading interactions (Sénéchal, Thomas, & Monker, 1995) and brief-in-context definitions during the book-reading process (Justice, Meier, & Walpole, 2005).

From meta-analyses and primary research involving children at risk of vocabulary delay, we conclude that more effective preschool book-reading interventions integrated interactive discussions guided by open-ended questions; structured book reading that includes multiple exposures to target words; and distributed interactive talk before, during, or after reading texts. Across most school-based preschool studies, interventions increased the vocabulary knowledge of at-risk children; however, their absolute level of performance remained significantly below that of typically performing children (e.g., an average of 16.17 standard score points below the norm on a receptive measure, the PPVT-III; Dunn & Dunn, 1997).

Previous research also documents that specific learner characteristics (e.g., age, language ability, and gender) may moderate the effects of shared book reading. For example, several researchers have suggested that the effectiveness of shared book reading varies by the age of participants, with larger effects for younger children (Blok, 1999; Bus, Van IJzendoorn, & Pellegrini, 1995; Mol et al., 2008), although there is some indication that shared reading interventions can be equally effective on oral-language outcomes for younger and older children (NELP, 2009). The effects of shared reading, however, weaken as children become conventional readers (Bus et al.). Although some evidence indicates that all subgroups of children, regardless of their socioeconomic backgrounds and ethnicity, may benefit from shared book reading, few studies have examined SES or have been conducted with underrepresented ethnic minorities (e.g., English language learners [ELLs]) to form definitive conclusions (August & Shanahan, 2006; Lonigan et al., 2008).

Collectively, recent research syntheses of vocabulary practices and shared book-reading interventions indicate that reading books to children while implementing effective strategies can accelerate oral language and vocabulary skills. The findings suggest, however, that children with limited vocabulary may require more intensive design and delivery features to obtain optimal benefit.

A CURRICULAR FRAMEWORK FOR INTENSIFYING SHARED BOOK READING

RATIONALE FOR AN INTENSIVE SHARED BOOK-READING INTERVENTION

The basis for our intervention was the knowledge hypothesis, which theorizes that vocabulary knowledge accrues through understanding vocabulary by using connected concepts and word relationships that are important for later comprehension (Anderson & Freebody, 1981; Nagy, 2005). The instructional implication is that vocabulary instruction should make explicit connections between taught words and concepts embedded in children’s background knowledge. These larger knowledge networks affect comprehension. By constructing curricular and pedagogical networks of knowledge through high-priority science themes, topics, and related words, our goal was to help children understand relationships between words and concepts while priming their background knowledge. Our pedagogical framework therefore integrated best practices from the shared book reading and vocabulary research through three instructional principles to build depth and breadth of vocabulary.

Instructional Principle 1: Building Vocabulary Through Thematically and Conceptually Related Book Reading. Hirsch (2006) posited that effective book reading builds contextual knowledge via “topic immersion, in which adults read a sequence of books organized by relevant topics over a period of days and weeks instead of selecting ‘stand-alone’” (p. 20) texts and materials. Building on the findings of Wasik and colleagues (2001, 2006) and Sénéchal et al. (1995), we created an intervention that was based on themes—broad, universal ideas about life, nature, or society—to provide opportunities to associate vocabulary in a broader context of conceptually related knowledge networks. Our hypothesis was that when educators organize instruction by using a big-idea theme and smaller topics, children can
understand new information by relating it to what they already know.

**Instructional Principle 2: Bridging Vocabulary by Integrating Informational and Narrative Texts.** Because using selected words in multiple contexts facilitates vocabulary learning (NRP, 2000), some experts suggest that shared book reading should incorporate varied genres—both traditional story-books and informational texts—to familiarize children with text conventions and prepare them for subsequent informational reading (Dickinson, 2001; Duke, 2000; Hirsch, 2006; Van Kleeck, 2003). In addition, because informational texts provide frequent exposure to a topical theme, this text genre is highly appropriate for conveying factual information about the social or natural world and allows teachers to make connections among books, new vocabulary knowledge, and children’s lives (Dickinson; Duke, 2000, 2004). In the WORLD curriculum, therefore, we sought to intensify the effects of shared book reading by bridging lexical sets of vocabulary between informational and narrative text.

**Instructional Principle 3: Building Vocabulary by Using Explicit Instruction in Shared Book Reading.** Explicit vocabulary instruction refers to those intentional instructional steps that teachers use to assist students in discussing, elaborating, synthesizing, and relating vocabulary, concepts, and content (Simmons, Pollard-Durodola, Gonzalez, Davis, & Simmons, 2008). Intervention studies suggest that preschool children at risk of vocabulary delay benefit from explicit instruction when educators explicitly preteach and review high-utility Tier II word meanings to build and activate necessary background knowledge and provide students access to academic language (Beck, McKeown, & Kucan, 2002; Stahl, 1991). Specifically, Tier II words are words that appear frequently in a variety of texts and allow children to describe familiar situations and people with greater sophistication and clarity (Beck et al.). Although thematic teaching can facilitate the organization and depth of book-reading content, the efficacy of thematic teaching depends on a carefully designed curriculum in which teachers use explicit strategies to develop and broaden vocabulary knowledge (Baker, Simmons, & Kame’enui, 1998).

**Overview and Research Questions**

Previous research has documented that traditional shared book-reading interventions may not sufficiently address the needs of young children who have significant vocabulary delay. The purpose of this study was to investigate the effects of a shared book-reading intervention that curricular organization and pedagogical explicitness intensified. The curriculum focused on related sets of vocabulary from important content (science themes and topics) and informational and narrative text genres. Pedagogy incorporated evidence-based practices and combined teacher-directed instruction and interactive book readings to accelerate vocabulary knowledge and concepts considered important for future reading.

Unlike the approach used in most prior shared book-reading studies, we worked from lexical sets of related vocabulary, using books as one context for introducing words, and focusing children’s attention on content-area vocabulary before, during, and after reading so that children would develop understanding of individual words and their relation to concepts and content. We specifically examined the effect of this intervention on the receptive and expressive vocabulary of preschool students at risk of vocabulary delay primarily associated with low SES. The children in the study entered preschool with significantly below-average vocabulary knowledge (less than the 30th percentile), as indicated on the Peabody Picture Vocabulary Test (PPVT-III; Dunn & Dunn, 1997). To increase the ecological validity of the study, the WORLD investigation occurred in preschool and Head Start settings, in which classroom teachers replaced traditional small-group book-reading procedures with the more intensive WORLD intervention. The researchers initially chose teachers from two school districts and randomly assigned them to one of two conditions: WORLD shared book reading or typical shared book reading.

Specific research questions included the following:

- What is the effect of the WORLD preschool shared book-reading program on standardized measures of receptive and expressive vocabulary?
What is the effect of the WORLD preschool shared book-reading program on proximal measures of receptive and expressive target vocabulary?

Is there differential impact of intervention on preschool children’s vocabulary development based on student characteristics (e.g., vocabulary knowledge, ethnicity, English learner status) at entry to preschool?

**Method**

The researchers initially chose teachers from six schools across two school districts and then randomly assigned them to either the intervention (n = 11) or practice-as-usual (comparison) condition (n = 7). The 148 students participating in the study were assigned to either treatment or comparison preschool classrooms on the basis of enrollment. The researchers administered standardized and researcher-developed pretests and posttests to assess students’ receptive and expressive vocabulary development.

**Participants**

**School Sites.** By design, we chose schools that had a high percentage of students from low socioeconomic backgrounds. We selected schools from two school districts and one regional Head Start agency in two ethnically diverse cities in south central Texas. In one school district, we conducted research in six classrooms in a half-day public preschool center. In the other school district, we conducted research in nine full-day Head Start classrooms located in five different schools. Finally, in the regional Head Start agency, we conducted research in three full-day Head Start classrooms located in two different schools.

Parents in the two school districts did not have the option of selecting either a half-day or a full-day preschool setting. One school district only offered half-day preschool, and the other district only had full-day Head Start. As subsequently discussed in greater detail, delivery of the intervention did not vary with the length of the school day. The same 20-minute intervention was used in both full-day and half-day settings.

**Teachers.** Of the 18 participating preschool teachers, 78% held bachelor’s degrees; 6%, master’s degrees; and 17%, associate’s degrees. In addition, 67% had elementary certifications, and 56% held an English as second language (ESL) certification. Three intervention teachers (27%) taught in half-day classrooms and had bachelor’s degrees, compared with three typical-practice (43%) teachers who taught in half-day classrooms, in which one teacher had a master’s degree and two had a bachelor’s degree. The remaining eight intervention teachers taught in full-day classrooms. Six held bachelor’s degrees, and one marked “other” degree, compared with the four comparison teachers who taught in full-day classrooms, with three teachers holding bachelor’s degrees and one holding an “other” degree.

Mean total years teaching did not differ significantly between WORLD teachers (M = 10.55, SD = 6.11) and comparison teachers (M = 10.57, SD = 9.78), t(16) = –.01, p = .992. Mean years teaching preschool also did not differ for WORLD teachers (M = 9.45, SD = 5.48) and comparison teachers (M = 8.00, SD = 6.73), t(16) = 0.50, p = .622.

**Students.** The researchers selected students by using a two-step screening process. In September 2006, the researchers asked the 18 participating teachers to distribute parental consent forms for all students in their classrooms. Classroom size ranged from 18 to 22 students (M = 19.3). Of the students with parental consent, 148 met the criteria for inclusion in the study, which required a score at or below the 30th percentile on the PPVT-III and evidence of English language proficiency as reported by the classroom teacher. The 148 students participating in the study were nested in either treatment or comparison preschool classrooms. Participating classroom shared-reading groups averaged 9 participating students, with a maximum of 10 per group.

Of the 148 students (81 WORLD and 67 comparison) originally in the study, 23 (16%) dropped out before the study was completed. One teacher dropped out before the intervention began, another teacher opted not to participate during the intervention, and students typically dropped out because their families moved or because they withdrew from school during the school year. Of the 23 students lost to attrition,
12 were from the WORLD condition and 11 from the comparison condition. Chi-square analyses showed a nonsignificant difference in attribution rates ($\chi^2 [1] = 0.07, p = .789$) between groups.

The final sample consisted of 69 WORLD and 56 comparison students, who demonstrated well-below-average vocabulary knowledge on the PPVT-III. In each condition, 70% of the children (48 of the 69 WORLD children; 39 of the 56 comparison children) had scores that were at or below the 15th percentile on the PPVT-III; the other 30% of the children in each condition scored between the 16th and 30th percentiles.

Student participants were on average 4.5 years old, with ages ranging from 4.0 to 5.3 years. Specifically, 118 children were under age 5 and 7 were 5 years old. Student ethnicity was as follows: African American (50%), Latino (28%), Caucasian (14%), and Asian American (7.9%). The researchers classified the Asian Americans as ELLs because they were acquiring English as a second language in mainstream classrooms. However, the Latino children were English speakers and not ELLs. The researchers excluded Spanish-speaking ELLs from the study and enrolled them in bilingual classrooms. Forty-seven percent of students were male, and 53% were female. All students were on free or reduced lunch, an index of low SES backgrounds.

Measures and Data Collection

Although standardized measures furnish valuable information for comparing student performance with national norms, researchers investigating vocabulary development often rely on measures that are more sensitive to growth (e.g., Hargrave & Sénéchal, 2000; National Institute of Child Health and Human Development [NICHD], 2000; Sénéchal et al., 1995; Whitehurst et al., 1994). In addition, the NRP (2000) strongly recommended using assessments created for a given intervention that are more sensitive to gains in vocabulary growth than standardized vocabulary measures. The battery for the current study included standardized, norm-referenced, and experimenter-developed measures of receptive and expressive vocabulary.

Trained graduate and undergraduate assistants individually administered all measures in two separate sessions, balancing classroom interruptions and the need for multiple test sessions to minimize child fatigue. They administered measures 2 weeks before and 2 weeks after completing the intervention. Pilot administration and fatigue estimates (i.e., children began to lose focus after 20 minutes) resulted in an estimate that each session lasted about 20 minutes. The typical administration was two sessions, but the administrators discontinued testing and broke it into three sessions if necessary. At both pretest and posttest intervals, graduate and undergraduate assistants administered the standardized receptive measure before the standardized expressive measure in the first session and administered the researcher-developed expressive measure before the researcher-developed receptive measure in the second session. All data collectors received 2 days of training before data collection; this training included time for practice. The researchers required each examiner to reach 100% mastery on administration of all measures before testing.

Although standardized measures furnish valuable information for comparing student performance to national norms, researchers investigating vocabulary development often rely on measures that are more sensitive to growth.

Receptive Vocabulary. The researchers used the PPVT-III, Forms A and B (Dunn & Dunn, 1997), as a general measure of receptive vocabulary. The PPVT-III is recommended for use in educational and clinical settings to measure receptive vocabulary and to screen for English language ability and general language development. On the PPVT-III, the child points to one of four pictures on a panel that represents an object or action that the examiner names. Alpha reliability coefficients reported in the manual for the current sample age group range from 0.94 to 0.95 for Forms A and B.

The researchers also addressed receptive vocabulary by using the proximal researcher-developed receptive picture vocabulary test.
(RDRPVT), which measured target words taught during the WORLD intervention. The procedure, materials format, and response requirements of the RDRPVT were similar to those of the PPVT-III. That is, tests consisted of one plate for each target vocabulary word. Each plate contained four illustrations, one depicting the target item and three depicting distracters. The graduate and undergraduate assistants discontinued the RDRPVT if the student answered the first six items incorrectly.

To construct this measure, the researchers used a stratified, random sampling procedure and selected one target word from each of the 24 books used during the intervention so that words represented concepts from both science themes—nature and living things. The researchers tested approximately 33% of the target vocabulary words as a representative sample to avoid an unduly long assessment, which would have been necessary to test preschool children on all 68 words taught in the intervention. On the basis of our sample, internal consistency was good, with a Cronbach’s alpha on this measure at posttest of .81, and split-half reliability of .75. The RDRPVT correlated .60 with the PPVT-III at pretest and .47 at posttest, suggesting that the measures were related but not identical.

Expressive Vocabulary. The researchers used the expressive one-word picture vocabulary test (EOWPVT; Brownell, 2000) to assess expressive vocabulary. The EOWPVT estimates expressive vocabulary by asking the individual to name objects, actions, and concepts pictured in illustrations. The EOWPVT requires a child to verbally provide the names of pictures of common objects. Alpha coefficients reported in the manual for the current sample age group range from .95 to .96.

The researchers also assessed expressive vocabulary by using the researcher-developed expressive picture vocabulary test (RDEPVT) to measure vocabulary knowledge specifically taught in the WORLD intervention. The procedure, materials format, and response requirements for the RDEPVT were similar to those of the EOWPVT. That is, tests consisted of one plate for each target vocabulary word. The students provided the vocabulary word that named the picture or action depicted. The target vocabulary was the 24 terms assessed on the RDRPVT. Like on the RDRPVT, the researchers tested approximately 33% of target vocabulary as a representative sample of the 68 words taught in the intervention. If the student answered, “I don’t know” or gave no response for the first six items (25% of the test), then the graduate and undergraduate assistants discontinued the test. However, testing continued if a student gave any responses to the first six items, whether or not the responses were accurate. The researchers scored responses on a scale that ranged from 0 to 2; a 0 indicated a vague or incorrect response; a 1 indicated an attribute of the target word (“water” for the target word “raindrop”); and a 2 indicated that the student furnished the target word or a synonym. Picture prompts were different from those used in the intervention. Cronbach’s alpha coefficient for the current sample at posttest was .78, and split-half reliability was .80. The RDEPVT correlated .41 with the EOWPVT at pretest and .47 at posttest, suggesting the measures were related but far from identical. A supplementary analysis indicated that there were no floor or ceiling effects.

INSTRUCTIONAL MATERIALS AND PROCEDURES

CURRICULUM DESIGN OF THE WORLD INTERVENTION

Content Organization. The researchers, guided by a review of the Texas preschool science guidelines, organized the intervention by science themes (Texas Education Agency, 1999) and Core Knowledge for Development of Preschool Topic Sequences (Core Knowledge Foundation, 2000). The teachers next aligned two themes—nature (things not made by people, such as water, air, and sunlight); and living things (things that eat, grow, and use air)—with preschool teachers’ instructional priorities; the teachers taught each theme for 6 weeks.

Topics within themes served as the next content organizer. The researchers organized weekly lesson units around a thematic topic or science concept that they developed through the book-reading sessions. For the nature theme, topics included water (Weeks 1 and 2), air (Week 3), light (Week 4), and seasons (Weeks 5 and 6). For living
things, the topics included plants (Weeks 7 and
8), animals (Weeks 9 and 10), and our body
(Weeks 11 and 12). For each topic, the re-
searchers selected one storybook and one infor-
mational book.

Pairing a storybook by theme with a com-
plementary informational text allowed us to expose
children to the critical features of text genres, pro-
vide multiple exposures to words and concepts, and
build a body of integrated conceptual knowl-
edge. Whereas storybooks facilitated discussions
on character, setting, the main idea (“the big
thing that happened”), and the story problem, in-
formational books facilitated discussions on learn-
ing more about a topic (e.g., what water can do
[Duke, Bennett-Armistead, & Roberts, 2003;
Smolkin & Donov an, 2000]). Figure 1 shows ex-
amples of narrative texts (storybooks) and infor-
mational texts organized by the topic water and
paired by a science theme and topic.

Book Selection. We selected a total of 24
books (11 storybooks and 13 informational texts)
that included age-appropriate content and lan-
guage, a sufficient number of important vocabulary
words (three) related to science themes and
topics, and target vocabulary and science concepts
depicted in book illustrations or photographs.

Vocabulary Selection. Researchers selected 68
vocabulary words from the 24 books to develop
lexical sets (e.g., water, liquid, frozen) to assist
students in acquiring associative knowledge. The
researchers selected vocabulary that was visually
represented in the text, was thematically related to

F I G U R E 1
Weeks 1 and 2: Topics, Books, and Vocabulary

<table>
<thead>
<tr>
<th>Week &amp; Topic</th>
<th>Book &amp; Concept</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Water</td>
<td>Rain Talk</td>
<td>1. Raindrop</td>
</tr>
<tr>
<td></td>
<td>How rain water moves</td>
<td>2. Drain</td>
</tr>
<tr>
<td></td>
<td>Amazing Water</td>
<td>3. Liquid</td>
</tr>
<tr>
<td></td>
<td>What water can do</td>
<td>4. Frozen</td>
</tr>
<tr>
<td>2 Water</td>
<td>A Snowy Day</td>
<td>5. Snow</td>
</tr>
<tr>
<td></td>
<td>What happens when water freezes</td>
<td>6. Melt</td>
</tr>
<tr>
<td></td>
<td>Snow</td>
<td>7. Cloud</td>
</tr>
<tr>
<td></td>
<td>What happens when water freezes</td>
<td>8. Snowflake</td>
</tr>
</tbody>
</table>

Project WORLD Content Overview
Theme 1: Nature

nature and living things, and was applicable to
higher-order concepts. The words were often
identical to academic science vocabulary lists that
state and local school districts developed for
kindergarten teachers. Words were typically Tier
II nouns (75%), followed by verbs (19%), all of
which the researchers selected primarily because
they were likely to appear in a wide variety of
texts, were of high utility for mature language
learners, and students were less likely to learn
them through everyday conversations (Beck et al.,

The teacher explicitly taught all new words
before reading a thematically related story or in-
formational book and used them to build chil-
dren’s background knowledge with engaging
picture cards provided in the researcher-developed
materials. To scaffold difficulty, early lessons in-
troduced two vocabulary words per book and
progressed to three words per text, for a total of
six words explicitly taught each week (see Figure 1
for an example of theme-related words).

Lesson Design. Critical lesson features in-
cluded the following:

• A 5-day instructional cycle in which the
teacher used specific days to introduce, re-
view, and integrate new words and science
concepts across twin texts.
• A before, during, and after book-reading rou-
tine designed to furnish opportunities for in-
struction and interactive discussions to occur
before and after reading the book.

Exceptional Children
• Instructional tasks ranging from low to high cognitive skills (see Figure 2 for an example of the critical lesson features of the WORLD shared book-reading intervention).

Basically, Days 1 and 3 introduced a new book, three new theme-related target words, and new science concepts. On Days 2 and 4, students repeated the book and reviewed word meanings and concepts. The lessons on Days 1 and 2 focused on reading a storybook, whereas lessons on Days 3 and 4 focused on reading an informational text. Finally, Day 5 activities provided a cumulative review of both word and WORLD concepts with opportunities to integrate knowledge learned from both the present week and previous lessons.

The researchers designed before-reading instruction to discuss the theme (talk about the theme/topic), activate and develop background knowledge (concept knowledge), preview the book while encouraging children to predict what would happen in a storybook or what they would learn about a topic in an informational text (text structure and prediction), and introduce new vocabulary with pictures and simple definitions. Example activities involved the teacher showing the book cover and introducing the theme by saying, “The part of nature we are going to learn about in this book is water. We use water to drink and take baths. Water is a part of nature.” Book illustrations and researcher-developed picture cards facilitated frequent exposures to target words before reading the text. For example, a teacher pointed to a picture and explicitly defined the vocabulary.
word, “Wind is air that moves and is a part of nature.”

During book reading, teachers explained vocabulary word meanings and critical science concepts while they read the book, stopping briefly to discuss the target vocabulary or the science concept on the page on which it occurred. For example, for the informational book Amazing Water (Berger, 1996), the teacher pretaught children the meaning of liquid, and when the term occurred in the book, the teacher briefly paused, pointed out the depiction of liquid, and asked children to identify the picture by using their new vocabulary. On the second day of book reading, the teacher stopped briefly and reviewed what water can do: “Water is a liquid. We can swim and play in water when it is a liquid.” In addition, storybook readings allowed teachers to stop briefly to identify what happened first, next, and last.

After the teacher read the book, activities included discussions that engaged students in reviewing target vocabulary; “be the teacher,” an activity in which children told what they knew about target vocabulary; and comprehension questions that focused on children relating and applying their new vocabulary while retelling a story sequence in a storybook or reviewing knowledge that they had learned about a science topic in an informational text. Example activities involved looking at picture cards and talking about what light can do. The teacher pointed to a picture and asked, “Does this show what light can do? Tell me about a time you have seen the light from a sunrise.” Last, the teacher encouraged children to use their new vocabulary at home.

Building on Dickinson and Smith’s (1994) research, the researchers designed activities along a cognitive continuum from low to high cognitive tasks. The teacher emphasized most lower cognitive skills (labeling, identifying, and recalling information) at the beginning of lessons when previewing/reviewing new information (e.g., “ready, set, go!”), with higher-order tasks occurring primarily in postreading discussions (“apply concept knowledge using vocabulary,” “be the teacher,” “finish what I say”). Therefore, vocabulary questions requiring high cognitive skills encouraged children to classify vocabulary picture/concept cards (e.g., this is a living thing; this is not a living thing), to describe how words “go together” (e.g., both snow and ice are kinds of water), and to relate words to life experiences (e.g., What kinds of water have you seen?). Readers can obtain more specific details about the curriculum or instruction by contacting the authors.

Training and Implementation of WORLD

One week before implementation, the 11 teachers in the experimental condition participated in a half-day professional development session in which researcher–developers of the WORLD intervention introduced the rationale for intervention, materials, and specific procedures. The researcher–developers introduced teachers to the architecture of the intervention (e.g., two thematic science units, seven topics, state preschool guidelines); and teachers practiced a range of cognitive activities to present before, during, and after book reading. To prepare teachers to implement the shared book-reading procedures, the researcher–developers also discussed previous research to support lesson components (e.g., repeated reading of books), modeling, guided practice, and paired activity sequences. Participating teachers received all instructional materials: manuals, thematic overviews, detailed lesson plans, books, and 8” × 10” picture/concept cards for each target vocabulary word. In addition to preintervention professional development, teachers met with researchers at three points during the intervention to review progress and identify and resolve implementation obstacles identified during fidelity observations or identified by teachers.

Beginning in October, preschool teachers in the WORLD condition taught the experimental shared book-reading intervention to groups of 9 to 10 children for 20 minutes a day, 5 days a week, for 12 weeks. The length of intervention did not vary by preschool type (half day vs. full day), because the researchers asked all teachers to replace their typical shared-reading process with the 20-minute experimental intervention. While the teacher conducted the shared book-reading intervention, the classroom paraprofessional engaged and supervised the remaining children in other scheduled activities.
TREATMENT FIDELITY

To measure treatment fidelity, project personnel developed a measure of critical intervention dimensions that corresponded to each of the 5 days of intervention. They evaluated each component by using a Likert-type scale with anchors ranging from a score of 0 (minimal/low implementation) to 3 (very high implementation). Example components included:

- Follows procedures (e.g., reviews words, asks questions).
- Provides designated opportunities for children to talk about words or concepts.
- Furnishes feedback and confirmation of student responses.

To document the validity of instructional behaviors as they occurred at the beginning, middle, and end of the WORLD intervention, project personnel conducted fidelity observations three times during the 12-week intervention. Across observations, the teachers’ fidelity of implementation scores ranged from 74% to 99% (M = 89%). Supplementary analyses showed that student engagement during these observations was high, with an average score of 2.36 (SD = .64) on a Likert-type scale, with anchors ranging from a score of 0 (minimal/low) to 3 (very high).

When project personnel recorded lower fidelity ratings, they furnished teacher feedback and targeted professional development in a small-group format at the teachers’ respective schools.

PRACTICE-AS-USUAL (COMPARISON) CONDITION

Comparison teachers engaged in “practice-as-usual” shared book-reading activities and strategies determined by the teachers. In general, teachers selected books from their own classrooms or school libraries. Comparison teachers reported using 3 of the 24 intervention book titles. However, these titles accounted for only 0.5% of the books that comparison teachers used, resulting in comparison students having minimum exposure to those three titles. Storybooks accounted for 18% of the titles, and informational books accounted for 82% of titles that comparison teachers reported. In contrast to teacher self-reports, the researchers’ observations indicated that at the time of the observation, comparison teachers either read storybooks (69%) or used informational texts (31%). The researchers did not observe teachers using both storybooks and informational texts. In addition, classroom observations indicated that, on average, book-reading sessions lasted 11.68 minutes, with most instructional time spent reading the book (53.34%, or 6.23 minutes). In comparison, book-reading sessions lasted for 17 minutes, on average, for interventionists, with 28% of the time dedicated to identifying and labeling target words. Finally, observations indicated that comparison teachers typically read books to the entire class.

RESULTS

ANALYTIC STRATEGY

Nonindependent observations were attributable to the nesting structure in our data (i.e., 125 students nested within 18 classrooms); the researchers used multilevel modeling (Hox, 2002) to analyze the data. Because observations are not independent when children are nested within classrooms, multilevel modeling is preferable to traditional fixed-effects models. When scores are not independent, using multilevel models allows for correct estimation of the standard errors of the coefficients so that researchers can make accurate statistical conclusions. The researchers analyzed all multilevel models by using the statistical package SPSS (2006) mixed (V15.0). They used restricted maximum likelihood (REML) for estimating all the models. REML is the default estimation method used in many multilevel programs when analyzing multilevel data with a continuous outcome/dependent variable (i.e., using the statistical packages HLM [Raudenbush, Bryk, & Congdon, 2004], SPSS mixed, and SAS proc mixed [SAS, 2006]).

In addition to the tests of significance of the coefficients representing differences between the WORLD curriculum and the comparison condition, we present effects for the researcher-developed measures in terms of the percentage of the maximum possible score to evaluate the practical significance of the differences.
ANALYSIS OF PRETREATMENT ASSESSMENTS

We had complete data on all demographic variables and both pretest and posttest measures for 125 children. To examine any potential differences between completers and noncompleters on the demographic variables (i.e., age, gender, ethnicity, English learner status, special education status, school district, and intervention group assignment) and the standardized pretest measures (i.e., PPVT-III and EOWPVT), we conducted a series of t tests and chi-square analyses. We found no statistically significant differences between the two groups on any of these variables. Also, no significant differences existed on any outcome measures for students who were 5 years or older compared with children who were younger than 5 years old at the start of the intervention.

We further examined differences between the intervention group and the comparison group on the demographic variables and the pretest measures. We found no statistically significant differences (after the Bonferroni correction) between the two groups on any demographic variable or pretest measure except English learner status. That is, significantly more English learners were in the treatment group than in the comparison group, but we controlled for that difference by entering English learner status in the statistical models, as subsequently described in more detail. Table 1 presents the descriptive statistics for the intervention and comparison groups, and Table 2 presents the means on the pretest and posttest measures.

ANALYSIS OF TREATMENT EFFECTS

We evaluated the intervention effect on posttest measures by using an analysis of covariance (ANCOVA) model, with the pretest measures and demographic variables (i.e., gender, age, English learner status, ethnicity, and special education status) as covariates. Because children were nested within classrooms, we analyzed the data by using multilevel models. We estimated four models, one for each of the four measures of interest (PPVT-III standard scores, EOWPVT standard scores, RDRPVT, RDEPVT). The model for each outcome measure used the pretest value of the same measure as one of the covariates. Except for the different measures modeled as the outcome and the inclusion of the corresponding value of the pretest measure, the models were identical.

The multilevel models consisted of two levels: Level 1, the student level; and Level 2, the
classroom level. For Level 1, we modeled one of the measures (e.g., PPVT-III) as a function of student-level covariates. These included the student's pretest score on the measure, as well as gender, age, English learner status, ethnicity, and special education status. Project personnel entered English learner and special education status as a single dummy code and entered ethnicity by using three dummy codes, comparing African American, Asian, and Hispanic students with Caucasian students, who served as the reference group.

The models estimated were random-intercept models, which means that project personnel entered Level 2 predictors (classroom characteristics) only to predict variance in Level 1 intercepts. Project personnel modeled the intercept as a function of school district, the teacher’s years of experience, and the intervention. They entered the three school districts in the model by using two dummy codes, with one school district serving as the reference group. They entered the intervention, also a dummy code, at Level 2, because random assignment to conditions took place at the teacher (or classroom) level rather than at the individual student level.

Although the length of the school day—full day versus half day—was an effect for which we considered controlling, we could not enter the variable into the models as a predictor because it was redundant with the school districts. (One of the school districts had all half-day classrooms, and the other two had all full-day classrooms.)

The first research question examined the effects of the shared book-reading intervention on the PPVT-III and EOWPVT, standardized measures of receptive and expressive vocabulary, respectively. The results of the analysis indicated no statistically significant main effects of condition on the PPVT-III ($\gamma = 0.52, p = .802$) or on the EOWPVT ($\gamma = 0.64, p = .701$) after controlling for the corresponding pretest scores, student demographics, school district, and years of teaching experience. With regard to actual growth, we compared standard scores on the pretest and posttest of the PPVT-III and EOWPVT. Both intervention and comparison students improved from pretest to posttest on both measures, as Table 2 shows. Receptive standard score means (PPVT-III) for the intervention group increased from the 7th to the 18th percentile and from the 7th to the 14th percentile for comparison students. Expressive standard score means (EOWPVT) increased for the intervention group from the 6th to the 11th percentile and from the 6th to the 9th percentile for comparison students.

For the second research question, which asked what effect the WORLD shared book-reading program had on proximal measures of recep-

### Table 2

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t(123)</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t(123)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPVT-III</td>
<td>Intervention</td>
<td>Comparison</td>
<td>0.03, p = .97</td>
<td>85.61</td>
<td>84.30</td>
<td>0.55, p = .58</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.73</td>
<td>11.69</td>
<td></td>
<td>12.51</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td>EOWPVT</td>
<td>Intervention</td>
<td>Comparison</td>
<td>0.02, p = .99</td>
<td>81.81</td>
<td>80.34</td>
<td>0.83, p = .41</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td></td>
<td></td>
<td>9.86</td>
<td>10.93</td>
<td></td>
</tr>
<tr>
<td>RDRPVT</td>
<td>Mean</td>
<td>14.33</td>
<td>14.71</td>
<td>-0.62, p = .54</td>
<td>21.10</td>
<td>16.21</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.22</td>
<td>3.65</td>
<td></td>
<td>3.07</td>
<td>3.36</td>
</tr>
<tr>
<td></td>
<td>% of max</td>
<td>59.71</td>
<td>61.29</td>
<td></td>
<td>87.92</td>
<td>67.54</td>
</tr>
<tr>
<td>REDPVT</td>
<td>Mean</td>
<td>22.59</td>
<td>22.05</td>
<td>0.41, p = .68</td>
<td>33.70</td>
<td>26.70</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>6.90</td>
<td>7.68</td>
<td></td>
<td>6.64</td>
<td>7.05</td>
</tr>
<tr>
<td></td>
<td>% of max</td>
<td>49.11</td>
<td>47.93</td>
<td></td>
<td>73.26</td>
<td>58.04</td>
</tr>
</tbody>
</table>

Note. \(^{a}n = 69. \(^{b}n = 56. PPVT-III = Peabody Picture Vocabulary Test, third edition, standard scores; EOWPVT = Expressive One-Word Picture Vocabulary Test, standard scores; RDRPVT = Researcher-Developed Receptive Vocabulary Test; RDEPVT = Researcher-Developed Expressive Picture Vocabulary Test.
tive and expressive target vocabulary, we found statistically significant main effects for the shared book-reading intervention for proximal researcher-developed measures of receptive vocabulary (RDRPVT; $\gamma = 4.94, p < .001$) and expressive vocabulary (RDEPVT; $\gamma = 5.98, p < .001$), after controlling for the corresponding pretest scores, student demographic variables, school district, and years of teaching experience. Table 3 presents parameter estimates and standard errors for all four multilevel models.

Because the researcher-developed measures asked students about only a subset of the 68 words that students were taught, we converted scores on the researcher-developed measures to percentages of the maximum possible score to clarify the sizes of the effects. As Table 2 shows, students’ mean scores on the pretest RDRPVT were about 60% in both groups. At posttest, the intervention group mean increased to approximately 88%, whereas the comparison group mean was approximately 68%. The improvement in the intervention condition was more than four times as large as that of the comparison group. Similarly, but less dramatically, students in both groups scored slightly below 50% on the RDEPVT at pretest. At posttest, the mean of the intervention students had improved to 73%, whereas the comparison students’ mean had improved less, to 58%.

A more in-depth investigation of word-acquisition patterns on researcher-developed measures for the children who scored below the 15th percentile on pretest PPVT-III and EOWPVT (treatment = 48, comparison = 39) indicated that intervention students demonstrated greater
growth in receptive word knowledge at posttest for the words that both intervention and comparison children had the least knowledge of at pretest. For example, of the 33% of target vocabulary that we assessed receptively at pretest, intervention and comparison children exhibited the least knowledge of the following thematically linked words:

- **Nature**—season (a time of year), rise (to move up higher [e.g., air]), gather (to pick up things [e.g., eggs] and put them together), and blossom (a flower on a tree).
- **Living things**—healthy (strong and not sick), root (the part of the plant that grows in the ground), vine (a long, curvy stem), and shade (a cool place with little sunshine).

At pretest, an approximately equal percentage of intervention (25%) and comparison children (28%) exhibited little knowledge of the word *season*; however, at posttest, 77% of the intervention children most at risk understood the meaning of the word compared with 31% of at-risk children in typical practice. Likewise, intervention (33%) and comparison (36%) children who were most at risk had little prior knowledge of the word *gather*; however, at posttest a greater percentage of intervention children (81%) grew more in knowledge of this word than children in typical practice (46%; see Table 4 for a complete list of intervention vocabulary words and the percentage of intervention students who learned each word).

**Analysis of Differential Treatment Effects**

The third research question focused on whether the WORLD intervention had differential effects on students’ vocabulary development as a function of the students’ characteristics when entering preschool. We answered this question in two ways. First, to address the question of whether the WORLD intervention was effective only for English learners, we repeated the previously described analyses but included only students whose primary language was English. For all four dependent measures, the pattern of coefficients that were significant was the same as in the analyses of the full sample.

We also examined differential treatment effects more broadly by using another set of four multilevel models. These models differed from the ones used in the main analyses in that they included an additional set of interaction terms to test whether the effect of the intervention varied with student characteristics. Specifically, project personnel entered the intervention dummy code in the Level 2 models, thereby predicting not only the intercept (as in the previous models) but also each of the student-level variables: pretest score, gender, age, English learner status, ethnicity, and special education status. After combining the Level 2 and Level 1 models to make full models, the effect of entering the intervention at Level 2 was to create cross-level interactions of the intervention with the student-level variables. Significance of any of these interaction terms would suggest that the intervention had different effects across values of that student variable.

Across all four models, none of the interaction effects was statistically significant (i.e., all the p-values were larger than .05), indicating that the intervention was not differentially effective for students having different characteristics at pretest. Because all results were nonsignificant, we do not present a table of results for these models.

**Discussion**

The primary purpose of this study was to examine the effect of a 12-week, intensive shared book-reading intervention on the receptive and expressive vocabulary development of preschool children from either Head Start or public preschools who had below-average vocabulary knowledge. We sought to intensify typical shared book-reading practices through curricular organization and pedagogical explicitness by drawing from shared book reading and vocabulary research.

**Effects of Shared Book Reading on Standardized Vocabulary Measures**

Results from the PPVT-III and EOWPVT showed no differences between the receptive and expressive vocabulary development of the preschool children in the WORLD and the comparison condition after controlling for pretest
scores, student demographics (e.g., gender, language spoken at home, ethnicity), school district, and years of teaching experience. This finding is not unexpected given the possibility that standardized measures are often insensitive to vocabulary growth (Elleman et al., 2009). Previous preschool shared book-reading studies have also documented mixed findings on standardized vocabulary measures for at-risk children, with only seven studies demonstrating significant effects, including Fielding-Barnsley and Purdie (2003), Neuman (1999), Wasik and Bond (2001), and Whitehurst et al. (1994). Of the seven studies, perhaps the most notable were conducted by Wasik and colleagues (Wasik & Bond; Wasik et al., 2006), who attributed children’s outcomes to comprehensive opportunities to develop vocabulary through interactive theme-based shared book reading and by integrating vocabulary opportunities within and outside book reading sessions (e.g., learning centers). Although Wasik and Bond’s 15-week, teacher-delivered interactive book-reading intervention was nearest in length to the WORLD intervention in the current study, it differed from the present intervention in that it provided numerous extension activities beyond shared book reading throughout the day.

The absence of effects on standardized measures may not be attributable only to the hypothesis that word knowledge may not easily transfer (Elleman et al., 2009) but may also be the result of insufficient extensiveness. Future research needs to enhance shared book-reading effects by extending both the duration (number of weeks) and the number of opportunities for interaction beyond book-reading sessions. For children who

### Table 4
The Percentage and Number of Intervention Students Who Correctly Identified Vocabulary Words at Posttest

<table>
<thead>
<tr>
<th>Words</th>
<th>Type of Word</th>
<th>N</th>
<th>% Learned</th>
<th>N</th>
<th>% Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Season</td>
<td>Noun</td>
<td>57</td>
<td>82.6</td>
<td>28</td>
<td>40.6</td>
</tr>
<tr>
<td>2. Rise</td>
<td>Verb</td>
<td>49</td>
<td>71.0</td>
<td>52</td>
<td>75.4</td>
</tr>
<tr>
<td>3. Snow</td>
<td>Noun</td>
<td>68</td>
<td>98.6</td>
<td>68</td>
<td>98.6</td>
</tr>
<tr>
<td>4. Healthy</td>
<td>Adjective</td>
<td>53</td>
<td>76.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Raindrop</td>
<td>Noun</td>
<td>69</td>
<td>100</td>
<td>67</td>
<td>97.1</td>
</tr>
<tr>
<td>6. Root</td>
<td>Noun</td>
<td>55</td>
<td>79.7</td>
<td>43</td>
<td>62.3</td>
</tr>
<tr>
<td>7. Float</td>
<td>Verb</td>
<td>68</td>
<td>98.6</td>
<td>67</td>
<td>97.1</td>
</tr>
<tr>
<td>8. Muscle</td>
<td>Noun</td>
<td>67</td>
<td>97.1</td>
<td>62</td>
<td>89.9</td>
</tr>
<tr>
<td>9. Vine</td>
<td>Noun</td>
<td>48</td>
<td>69.6</td>
<td>26</td>
<td>37.7</td>
</tr>
<tr>
<td>10. Summer</td>
<td>Noun</td>
<td>55</td>
<td>79.7</td>
<td>31</td>
<td>44.9</td>
</tr>
<tr>
<td>11. Woods</td>
<td>Noun</td>
<td>56</td>
<td>81.2</td>
<td>57</td>
<td>82.6</td>
</tr>
<tr>
<td>12. Frozen</td>
<td>Adjective</td>
<td>67</td>
<td>97.1</td>
<td>59</td>
<td>85.5</td>
</tr>
<tr>
<td>13. Thermometer</td>
<td>Noun</td>
<td>49</td>
<td>71.0</td>
<td>44</td>
<td>63.8</td>
</tr>
<tr>
<td>14. Born</td>
<td>Verb</td>
<td>60</td>
<td>87.0</td>
<td>44</td>
<td>63.8</td>
</tr>
<tr>
<td>15. Rainbow</td>
<td>Noun</td>
<td>68</td>
<td>98.6</td>
<td>67</td>
<td>97.1</td>
</tr>
<tr>
<td>16. Ocean</td>
<td>Noun</td>
<td>64</td>
<td>92.8</td>
<td>61</td>
<td>88.4</td>
</tr>
<tr>
<td>17. Sky</td>
<td>Noun</td>
<td>67</td>
<td>97.1</td>
<td>65</td>
<td>94.2</td>
</tr>
<tr>
<td>18. Gather</td>
<td>Verb</td>
<td>58</td>
<td>84.1</td>
<td>56</td>
<td>81.2</td>
</tr>
<tr>
<td>19. Shade</td>
<td>Noun</td>
<td>62</td>
<td>89.9</td>
<td>44</td>
<td>63.8</td>
</tr>
<tr>
<td>20. Blossom</td>
<td>Noun</td>
<td>56</td>
<td>81.2</td>
<td>44</td>
<td>63.8</td>
</tr>
<tr>
<td>21. Heart</td>
<td>Noun</td>
<td>63</td>
<td>91.3</td>
<td>42</td>
<td>60.9</td>
</tr>
<tr>
<td>22. Cloud</td>
<td>Noun</td>
<td>66</td>
<td>95.7</td>
<td>65</td>
<td>94.2</td>
</tr>
<tr>
<td>23. Garden</td>
<td>Noun</td>
<td>61</td>
<td>88.4</td>
<td>54</td>
<td>78.3</td>
</tr>
<tr>
<td>24. Dark</td>
<td>Adjective</td>
<td>68</td>
<td>98.6</td>
<td>67</td>
<td>97.1</td>
</tr>
</tbody>
</table>
enter preschool with significant vocabulary delay, a limited period of time dedicated to explicit shared book-reading vocabulary instruction may not sufficiently alter learning trajectories on general vocabulary measures.

**Effect of Shared Book Reading on Proximal Target Vocabulary Measures**

In contrast to their performance on general vocabulary measures, children in the WORLD intervention condition scored substantially higher on researcher-developed receptive and expressive posttests than students in the comparison condition. These outcomes are similar to those of previous shared book-reading studies, in which researcher-developed measures were more sensitive to vocabulary growth than standardized assessments (e.g., Elleman et al., 2009; Hargrave & Sénéchal, 2000; NRP, 2000; Sénéchal et al., 1995).

Because we integrated multiple content and pedagogical dimensions, it is not possible to determine the specific instructional elements that accounted for effects. However, we can conclude that the explicit, thematic intervention increased children’s ability to associate illustrations with science vocabulary (e.g., soil) and to define taught vocabulary (e.g., What is soil?). Despite the increased ability of intervention children to make these associations and to provide more in-depth definitions of science-related words than comparison children did, vocabulary remained that students did not learn sufficiently. We speculate that the words that they did not adequately learn (e.g., rise) required greater depth of background knowledge and more scaffolded opportunities so that the children could make associations beyond the book. For example, it is easier to use the word rise (to move up higher [e.g., air]) within the context of a book with related pictures than it is to make associations in a decontextualized setting.

Although findings indicate that, on average, students benefited from the intervention, future research should attend to students’ entry-level knowledge. Few interventions have considered the vocabulary that children know before an intervention, a factor that may enable us to preserve precious instructional time and differentiate instruction more effectively.

**Differential Effect of Shared Book Reading on the Basis of Student Characteristics**

Findings indicated no significant interaction between instructional condition and learner characteristic (e.g., age, gender, English learner status, pretest score). This outcome suggests that preexisting levels of vocabulary or other student characteristics did not moderate the students’ response to intervention. An important implication of this finding is that children with lower levels of vocabulary can derive benefit from shared book reading, particularly on curriculum-specific vocabulary. This finding confirms previous results reported by Sénéchal et al. (1995) and Justice et al. (2005). However, although gains were comparable, they did not close the vocabulary gap. Consequently, further investigation of methods to accelerate vocabulary learning is necessary. Also, because of the small sample of ELL/Asian Americans, we cannot overgeneralize our findings for English language learners during the preschool years.

**Limitations and Implications for Future Research Interventions**

Readers should consider our findings in the context of the following limitations. Because we did not obtain follow-up data on children’s vocabulary growth, we were not able to evaluate whether effects on researcher-developed measures remained beyond the 12 weeks of intervention. By design, we selected words of potential importance for reading comprehension. To determine whether learning content-related vocabulary in preschool promotes subsequent reading comprehension, we would need to follow children into higher grades. We also recognize the complexity of measuring depth of word knowledge and acknowledge that our vocabulary measures targeted associative word knowledge and may not reflect the multiple dimensions of word depth. In addition, although we presumed that our researcher-
developed and standardized measures measured the same constructs, correlations between the two were low.

Our intent was to examine the efficacy of the WORLD instructional practices on typical shared book-reading instruction; therefore, to avoid influencing or modifying typical shared book-reading instructional practices, comparison teachers did not have access to intervention books, target words, and other researcher-developed materials. Future research should examine the effects of less intensive interventions, that is, typical shared book reading using parallel books in both comparison and intervention conditions on children’s vocabulary outcomes.

The WORLD vocabulary intervention consisted of 12 weeks, or 60 daily lessons of 20-minute instruction. Vocabulary interventions in previous shared book-reading studies at the preschool level have varied in the number of book-reading sessions. Although no clear guidance indicates the amount of instruction needed to positively affect expressive and receptive vocabulary outcomes of children who enter school with low vocabulary knowledge, current findings and previous evidence suggest that general shared book-reading strategies may not be sufficient to accelerate vocabulary development for children with limited background and vocabulary knowledge (Sénéchal et al., 1995; Wasik et al., 2006).

Future studies might examine whether an association exists between the level of fidelity of implementation and the vocabulary outcomes of at-risk children. Post hoc analyses showed no significant effects of fidelity of implementation of the WORLD intervention on our standardized and proximal measures after controlling for student and teacher effects.

Designing and delivering interventions that can boost the vocabulary development of young children from low-income environments is a challenging endeavor. Several researchers have pioneered efforts in this area by using shared book reading as a tool to develop and extend the vocabulary of young children (Lonigan et al., 1999; Sénéchal et al., 1995; Wasik & Bond, 2001; Wasik et al., 2006). Nonetheless, empirical findings from this exploratory study provide preliminary guidance on the words, book content, and best practices that educators can use to intensify shared book-reading instruction for children who enter school at risk of vocabulary delay.

Although knowing the meaning of words is not what increases children’s comprehension, knowing word meanings is one indication that children are knowledgeable about related concepts. Because word meanings do not exist in isolation but are connected with world concepts, educators must teach word knowledge within the context of world knowledge to better prepare children for future comprehension (Anderson & Freebody, 1981; Nagy, 2005). Vocabulary or word knowledge speeds word recognition; however, world knowledge—including background and conceptual knowledge—accelerates comprehension.

Although knowing the meaning of words is not what increases children’s comprehension, knowing word meanings is one indication that children are knowledgeable about related concepts.

Guided by these theoretical underpinnings, educators should recognize that future design of vocabulary interventions for at-risk children may require curricular modifications that integrate both word and world knowledge through book reading and non–book reading instructional models that promote opportunities for (a) multiple exposures to words and related concepts, (b) instructional extensiveness, (c) explicit connections between content-area knowledge and academic language, and (d) the development of a strong oral language foundation.

Empirical guidance from the shared book-reading and vocabulary-research bases indicates that multiple exposures to vocabulary integrated into meaningful content and conversation may serve as one important ingredient of both shared book reading and non–book reading methods. Further, emerging evidence suggests that to obtain optimal effects, educators may have to infuse vocabulary instruction and discussion throughout the preschool day and not constrain them to a particular instructional setting. In addition, because at-risk children enter school with limited background knowledge, vocabulary instruction
and discussion may require explicit instruction that assists children in making connections between content-area knowledge (e.g., science) and academic language.

By interacting with informational texts, children can learn both academic content and words. Presenting academic vocabulary by using lexically related sets of words may be an important instructional scaffold in helping children from low SES backgrounds with limited vocabulary and previous knowledge learn and use words across multiple contexts in both contextualized and decontextualized applications. Although teaching Tier II words is important, learning these words may have smaller effects when young children do not have a strong language base (Beck & McKeown, 2007); teachers must therefore build a strong oral language foundation in conjunction with providing opportunities to learn words.

Educational Implications

Several implications from our study have relevance to preschool practice. First, intensive shared book reading was effective in extending young children’s knowledge of target vocabulary. Results indicate that time allocated to high-priority words does produce practically significant effects, particularly for children who enter preschool with extremely low vocabulary scores. Second, the findings suggest the importance yet insufficiency of shared book reading as a means to accelerate the vocabulary development of young children whose previous experiences place them at early risk of vocabulary delay. A third implication from our study is that opportunities to read books should translate into opportunities to talk about books, words, concepts, and life. Despite the high value that teachers place on books, classroom observations of conventional book-reading sessions indicate that only 11% to 28% of teachers strategically read books aloud to build vocabulary knowledge (Brabham & Lynch-Brown, 2002; Dickinson, 2001). To close the vocabulary gap, practitioners must reexamine the instructional intent of their shared book-reading practices.

Conclusions

Previous research has documented that children who enter preschool with significant vocabulary delays may not derive adequate benefit from conventional book-reading practices to close vocabulary gaps (Lonigan & Whitehurst, 1998; Wasik et al., 2006; Whitehurst et al., 1994). Although the results of this study show promise for using the WORLD intervention to boost preschool children’s vocabulary knowledge, the question remains whether—and to what degree—an intensified book-reading intervention with thematic teaching can produce generalizable effects on standardized vocabulary measures for children with low vocabulary knowledge. Thematic instruction can organize book-reading content into skillful “knowledge networks” (Neuman, 2006, p. 35), integrating multiple exposures with newly acquired concepts. However, more research is necessary to determine how to intensify and expand the nature of thematic book-reading instruction and interactions for young children at risk for vocabulary and language difficulties.

References


ABOUT THE AUTHORS

SHAROLYN D. POLLARD-DURODOLA (CEC TX Federation), Assistant Professor, Educational Psychology; JORGE E. GONZALEZ (CEC TX Federation), Assistant Professor, Educational Psychology; DEBORAH C. SIMMONS (CEC TX Federation), Professor, Educational Psychology; OIMAN KWOK, Associate Professor, Educational Psychology; AARON B. TAYLOR, Assistant Professor, Psychology; MATTHEW J. DAVIS, Graduate Research Assistant, Educational Psychology; MINJUNG KIM, Graduate Research Assistant, Educational Psychology; and LESLIE SIMMONS (CEC TX Federation), Project Coordinator, Educational Psychology, Texas A&M University, College Station.

Correspondence concerning this article should be addressed to Sharolyn D. Pollard-Durodola, Texas A&M University, Educational Psychology, Bilingual Programs, TAMU 4225, 107G Harrington Tower, College Station, TX 77843-4225 (e-mail: sdurodola@tamu.edu).

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