

RESEARCH-TO-PRACTICE SUMMARY

Accelerating Preschoolers' Content Vocabulary and World Knowledge: Collaboration Between Teachers and Researchers

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The purpose of this three-year investigation was to develop an 18-week shared book reading intervention guided by teacher feedback on instructional practices, including the design and delivery features from the shared book reading and vocabulary research that could be effectively implemented by preschool teachers to accelerate children's content vocabulary knowledge. The results of this study bridge research to practice by contributing to the theoretical understanding of the feasibility of instructional practices that intensify typical shared book reading practices.

Keywords: vocabulary, shared books reading intervention

As children learn to use more words, they learn more about the world around them and become better prepared to participate in discussions about academics and life experiences, and to comprehend text in later school years (Catts, Fey, Zhang, & Tomblin, 1999; Hirsch, 2006). Many children initially acquire vocabulary concepts and related general content knowledge through daily “informal informational lessons” (Neuman, 2006, p. 25) with a parent or other adult. Such rich informational conversations allow children to gain vocabulary knowledge in the context of acquiring world knowledge so that they become able to talk about broad experiences. In contrast, children who are not exposed to rich early language experiences may arrive at school with gaps in vocabulary and connected world knowledge that negatively impact their ability to benefit from general school instruction and academic discussions (Hart & Risley, 1995). These children require evidence-based school practices that can accelerate vocabulary learning early while building content knowledge.

Traditionally, one of the primary approaches to accelerating young children's vocabulary knowledge has involved reading and talking about books (Ezell & Justice, 2005; What Works Clearinghouse [WWC], 2006; Whitehurst & Lonigan, 1998). In this intentional approach to vocabulary acceleration, informational texts and storybooks that are paired by a content-related theme (the Earth) and topic (Land/Water) can be used to integrate frequent exposures to new

words and concepts. Thus, such interactive book reading approaches with opportunities for language stimulation (e.g., extending children's oral responses to open-ended questions about a story, modeling appropriate language use) have been found beneficial for vocabulary learning – especially for children who enter school with low vocabulary knowledge (Lonigan, Shanahan, & Cunningham, 2008; National Early Literacy Panel [NELP], 2009; Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2012). Indeed, interactive shared book reading that integrates intentional book discussions around both informational texts and storybooks may accelerate both content vocabulary learning (*liquid, solid, melt*) and world knowledge (e.g., science concepts).

However, most typical shared book reading practices are not robust or interactive enough to support children's oral vocabulary development in ways that can close both early word and knowledge gaps (Mol, Bus, & de Jong, 2009; Penno, Wilkinson, & Moore, 2002). Additionally, to date, there is no clear understanding of which scientifically based shared book reading practices are usable and feasible for teachers in real classroom settings.

PURPOSE OF THE STUDY

The purpose of this study was to describe design and delivery features from the shared book reading and vocabulary research that may effectively and feasibly be implemented by preschool teachers while accelerating children's content vocabulary knowledge in daily 20-minute thematic lessons (science and social studies themes/topics). Implementing a design research methodology, the researchers systematically developed and refined an interactive shared book reading intervention through cycles or phases of planned observations, analyses of lesson implementation, and curriculum revision to determine under which conditions the intervention would be effective in real school settings (Reinking & Bradley, 2008; Shavelson, Phillips, Towne, & Feuer, 2003).

To our knowledge, this methodology has been used in the design of few preschool vocabulary curricula (Bradley & Reinking, 2011; Neuman & Dwyer, 2011) or in the development of preschool vocabulary interventions in which teacher collaboration, insight, and feedback played a decisive role. The present study gave preschool teachers an opportunity to bridge research and practice by providing insights into the feasibility of a scientifically grounded interactive shared book reading approach to boost children's oral language abilities.

METHOD

Design and Context of the Study

The design experiment consisted of three distinct phases that allowed researchers to evaluate the feasibility and effectiveness of a content-based vocabulary shared book reading approach conducted in Head Start and early childhood centers:

Phase I: Preliminary Intervention Design (Year 01)

Phase II: Field Testing, Teacher Feedback, and Curriculum Refinement (Year 01)

Phase III: Intervention Effects, Teacher Feedback, and Curriculum Refinement (Years 02 and 03)

School districts. Teachers and students participating in the study came from two school districts that had a high percentage of students with low socioeconomic status (SES) (e.g., free and reduced-priced lunch) who were likely to enter school with limited exposure to rich vocabulary and world knowledge, placing them at risk for future comprehension difficulties.

Teachers. Across the three years of the design experiment, 25 preschool teachers (intervention teachers, $n = 16$; comparison teachers, $n = 9$) with similar educational and professional experiences participated in the study.

Students. Across the three years of the design experiment, 309 students participated in the study (Phase II, $n = 36$, Phase III, $n = 273$) from low-SES families and from ethnically diverse backgrounds.

Data Collection, Analysis Procedures, and Results

Below are summarized the procedures for data collection and analysis across the three design experiment phases.

Phase I: Preliminary Intervention Design. Prior to designing the intervention, the three researchers worked to better understand typical shared book reading practices in preschool settings with children with limited vocabulary knowledge. First, researchers informally observed shared book reading lessons in three classrooms at a preschool center and independently recorded field notes about the length of the book reading session, target word instruction, adult-child interactions/conversations, organization of book reading content, instructional format, and text genre. Second, the researchers reviewed the shared book reading literature from 1990 to 2006 to identify features of effective shared book reading interventions conducted with young children who came from low-SES backgrounds and/or who exhibited low vocabulary knowledge. Lastly, one researcher and a doctoral student reviewed three commonly used preschool curricula and materials to determine their alignment with evidence-based shared book reading and vocabulary practices (e.g., evidence of explicit vocabulary instruction, vocabulary instruction distributed before, during, and after book reading).

The researchers observed that (a) typical preschool book reading sessions were brief (averaging 5-7 minutes in length), (b) student engagement was minimal with little adult-child conversations, (c) informational texts were not used, (d) word meanings were not always emphasized, and (e) there was little priming of students' background knowledge during the book reading session.

Further, the review of the three preschool curricula and materials used in the participating districts indicated that (a) vocabulary instructional tasks were somewhat consistent with scientifically based practices and (b) provided limited information on how to scaffold instruction for difficult tasks or develop background knowledge related to new words and connected information. By comparison, a review of previously conducted school-based shared book reading interventions conducted in Head Start or subsidized child-care settings indicated that more effective book reading interventions included many of the following practices: (a) repeated text readings (e.g., two readings per text), (b) interactive adult-child dialogues, (c) multiple exposures to vocabulary to accelerate learning, (d) intentional teaching of words during brief in-context discussions, and (e) instruction and discussions before, while, and after reading the text.

Collectively, findings from the curricular and shared book reading literature review and observations of typical shared book reading practices were used to guide the design of a multi-dimensional shared book reading approach with the following goals: (a) world knowledge (science) would be developed by priming background knowledge through multiple exposures to weekly instructional units organized around twin texts (one storybook + informational text per week) connected by a theme and smaller topic; and (b) word knowledge would be accelerated through the strategic selection and explicit instruction of high-utility content-related words (three words per book, six per week) across multiple contexts with repeated text readings and interactive discussions.

This shared book reading routine would utilize a five-day instructional sequence. Day 1 would be used to introduce (a) a storybook and important background information on an important theme/concept (e.g., *The earth is made of land and water.*) and smaller topic (*Ocean*); (b) three semantically related vocabulary (e.g., *ocean, wave, underwater*) with child-friendly definitions (*Waves are the ocean water that move back and forth.*); and (c) comprehension questions (*What was a big thing that happened to the sharks in the story?*). Day 2 would include a second reading/discussion of the book and activities to review vocabulary via opportunities to make connections between words, concepts, and life experiences (*Look into the magic mirror and tell us about the ocean that you see!*). Days 3 and 4 would accomplish the same goals but would introduce and extend new information via a thematically linked informational text and three new semantically related words. Finally, Day 5 would integrate all words ($N = 6$) and knowledge learned in the week with opportunities to make connections to science concepts from previous weeks.

Phase II: Field Testing, Teacher Feedback, and Curriculum Refinement. The primary objective in Phase II (Year 01) was to field test and refine the preliminary shared book reading intervention with the assistance of four preschool teachers, who implemented the shared book reading lessons in two-week curricular thematic units with a group of children ($N = 9$) in their classrooms. Prior to implementing the intervention, teachers received three hours of professional development (PD), in which researchers-developers demonstrated how to read and talk about books, words, and a science topic. The participating preschool teachers completed a Teacher Feedback Form (a scale from very low to very high) to provide insights into the feasibility of the instructional tasks (appropriateness of activity sequence, etc.) and the usability of the materials (ease of using manipulatives, ease of teacher instructions, etc.).

After field-testing the shared book reading lessons, the four teachers met with researchers and shared their insights in two focus group discussions. The teachers' feedback was as follows: (a) higher-level thinking tasks required more scaffolding strategies in the curriculum due to the linguistic demand of the language structures for young children; (b) additional resources were needed for building children's limited background knowledge so that children could understand critical science vocabulary and related concepts well enough to be able to participate in interactive discussions with the teacher and other children; (c) the complex sentence structures in some informational texts threatened the ease of reading/comprehending book content; (d) the number of new words taught per book should be gradual so that young children could become acclimated to the book reading process; and (e) more activities and opportunities were needed to monitor individual child responses and progress within the larger group discussion. Overall, teachers confirmed that students successfully learned the six words taught per week and reported

instances of children using the words to describe life experiences beyond the book reading session (e.g., *I saw a liquid at home!*).

Teachers' comments and feedback were subsequently used to refine the instructional approach (integrate additional background on taught concepts using relevant visuals; integrate opportunities for paired student practices so that teachers could monitor and extend individual child responses, etc.) and to guide the development of a comprehensive 12-week content-based (science themes) preschool shared book reading vocabulary intervention using a five-day scope and sequence of daily 20-minute interactive book discussions.

Phase III: Intervention Effects, Teacher Feedback, and Curriculum Refinement.

In Phase III (Years 02 and 03), researchers evaluated the impact of the content-based shared book reading intervention on preschool children's vocabulary outcomes (researcher-developed and standardized measures) and refined the curricular intervention while investigating its features in terms of their potential usability and feasibility.

Initial 12-week science intervention. In the first randomized trial (Year 02), 18 teachers were randomly assigned to implement the 12-week shared book reading intervention ($n = 11$) with supporting thematic science books and materials or the practice-as-usual (comparison) condition ($n = 7$; teachers in this group used their own books and typical book reading strategies). All teachers implemented shared book reading with a large group of 9 to 10 children who were at or below the 30th percentile on the Peabody Picture Vocabulary Test - III [PPVT], Forms A and B (Dunn & Dunn, 1997). These children required intensive early intervention with oral language extensions because they exhibited low vocabulary knowledge and were at risk for later reading comprehension difficulties. PD was provided prior to intervention implementation and followed by three distributed 90-minute booster sessions (beginning, middle, and before the end of the intervention) to ensure consistent high-quality teaching.

Nine of the 11 intervention teachers met with 2 researchers in a focus group held one month after the intervention period to discuss their implementation experiences. Teachers reported ease in using pictures (use of book pictures/illustrations to teach vocabulary and connected concepts) and vocabulary cards (picture concept cards with pictures depicting vocabulary, connected concepts, and themes). Most teachers reported using explicit vocabulary instruction as a key component of the intervention, including using key words in the discussion such as *vocabulary exposure* and *vocabulary rich*.

In terms of curricular weaknesses, teachers referred to the "length" of the session, (it was too long for young children) and group size (too many children in the group). Further, 18% felt that children sometimes did not understand some of the vocabulary concepts (e.g., year – a period of time from one birthday to the next) due to difficulty of the target word.

The teachers were satisfied with the following intervention design and delivery features, which they found feasible to implement: thematic science instruction, vocabulary review tasks, and scaffolding with pictures and book illustrations to teach and clarify word and concept knowledge. However, the consensus was for shared book reading to occur in smaller groups (5 or 6 students) because it was difficult to manage the behavior of a larger group of young children during the 20-minute book discussions even when an instructional aide engaged the students in the class who were not participating in the shared book reading intervention with other activities (e.g., center-based activities).

In addition to teacher feedback, results from expressive and receptive curriculum based vocabulary measures indicated that children learned the science vocabulary concepts that were taught as reflected. However, no statistically significant main effects were found on standardized receptive and expressive vocabulary measures. We hypothesized that the brief intervention period (12 weeks) and large group size (9-10 children) may have limited opportunities for interactive conversations for preschool children with limited vocabulary and world knowledge.

In response to these Year 02 findings, the shared book reading approach was refined to increase the (a) feasibility of instructional practices, (b) instructional extensiveness of the intervention (i.e., 18 weeks of instruction; the addition of two social studies themes; additional background information), and (c) dialogue opportunities for children to make explicit and deeper connections between taught words and their background knowledge. We believed that at-risk children would benefit from broader and deeper word-world connections that result from understanding relationships between new words and their broader connected concepts (Nagy, 2007). These “networks of concepts” or knowledge could be facilitated through higher-level cognitive vocabulary tasks requiring more analytical thinking (e.g., *What happens to a riverbank when we have a lot of rain? What is the difference between a stream and a river?*), additional background knowledge, and oral language modeling.

Expanded 18-week science+social studies intervention. In Year 03, 21 teachers were randomly assigned to either the 18-week intervention ($n = 13$) or the practice-as-usual (comparison) condition ($n = 8$) and taught smaller groups (5-7 children). The PD module was more intensive in this year with initial PD including more research evidence on the rationale for specific intervention strategies (use of informational texts, repeated reading, stopping for brief in-context definitions, etc.). As in Year 02, the researchers also provided 90-minute PD booster sessions (beginning, middle, and before the end of the intervention) to offer feedback on teachers’ implementation practices and to ensure consistent high-quality teaching.

In this year, curriculum based vocabulary outcomes indicated that children were able to learn the science and social studies concepts that were taught, and, unlike in Year 02, statistically positive and significant results were found for the standardized receptive vocabulary measure (PPVT-III). That is, children in the intervention group scored higher at posttest than children who participated in typical shared book reading practices. However, unlike previous interactive shared book reading studies, the intervention did not have a statistically significant effect on children’s expressive vocabulary. It is possible that preschool teachers required more intensive PD to adequately scaffold interactive analytical discussion tasks.

DISCUSSION

Although previous studies have examined the use of shared book reading as a tool for developing and extending at-risk children’s oral vocabulary in school settings (Lonigan, Anthony, Bloomfield, Dyor, & Samwell, 1999; Neuman & Dwyer, 2011; Wasik, Bond, & Hindman, 2006), few investigators have relied on cycles of curriculum development and refinement in collaboration with preschool teachers to better understand the feasibility and usability of scientifically based book reading practices. Guided by teacher insights and feedback, the researchers conducting the current study learned more about the features of instructional

feasibility and usability of a content-based shared book reading intervention implemented with children in high poverty settings.

Feasibility and Usability of Instructional Practices

Overall, preschool teachers in the present study implemented many shared book reading instructional features with ease (e.g., repeated reading of texts, brief in-context definitions, and distribution of open-ended questions throughout the thematic book reading process) while maintaining a high teaching quality. Teachers also learned to integrate content instruction across thematically paired informational texts and storybooks although initially they were more comfortable reading from storybooks. Lastly, teachers preferred implementing tasks that required brief rapid vocabulary reviews and the use of instructional visuals (pictures, book illustrations, theme cards) during the book reading process.

Many teachers, however, were not accustomed to scaffolding analytic discussions and did not always know how to extend children's conversational abilities beyond typical book reading practices. This became apparent in the implementation of instructional tasks that required higher-level analytical thinking and discussion to help children make important conceptual connections (e.g., If you tasted *sea* water would it taste like water we drink every day? Why or why not?) and talk about conceptual differences (*What is the difference between frozen water and liquid?*). These tasks remained challenging for some preschool teachers.

In a separate observation study, however, researchers found that content related shared book reading instruction that emphasized analytical association-level talk, predicted growth in children's receptive vocabulary (Gonzalez, Pollard-Durodola, Simmons, Taylor, Davis, Fogarty, & Simmons, 2013). In the end, these higher level analytical discussions are dependent on the teacher's expertise in providing feedback, extending oral responses, and modeling appropriate language use.

Implications and Suggestions for Practice

Overall, findings from this study indicate that children can benefit from explicit and targeted content vocabulary instruction and that teachers can learn to implement research-based book reading practices in ways that accelerate children's oral language abilities. One key challenge is providing the appropriate level of instructional support for early childhood educators that will impact children's vocabulary and oral language acquisition (Dickinson, 2011). Classroom observation research suggests that *increasing teachers' awareness* of their instructional behaviors via ongoing opportunities for personalized feedback (e.g., extensive coaching) and self-reflection (Pianta & Hamre, 2009) may improve adult-child language interactions in at-risk settings.

Specifically, it may be beneficial for preschool teachers to engage inreflective conversations with other practitioners and/or an instructional coach about their content based shared book reading implementation. In these conversations, teachers can identify: (a) what is working (*I feel most confident about engaging children in a discussion on the week's theme prior to reading the book.*), (b) what needs attention (*I'm having difficulty with moving too quickly through the lesson and asking open-ended questions without creating a discussion.*), (c)

children's successes (*My children are able to talk about the big thing that happened in the storybook*); and (d) children's difficulties (*My children have difficulty talking to their partner about what they learned on a book page.*). Insights gained from this process can be used to establish two or three goals to strengthen implementation practices and content learning. Goals may include the following:

1. Model how to talk about conceptual differences and similarities prior to asking children to engage in analytical conversations.
2. Use sentence stems as a conversational prompt to help children talk about important concepts: "Cindy, say *my favorite liquid is _____.*"
3. Encourage children to talk about concepts during paired conversations: "Ana, turn and tell your friend about the living things that you might find in a meadow. Say, "____(s) can live in a meadow."

In our study, we reviewed and adjusted instructional goals as teachers made progress and felt more confident about their ability to engage children in interactive conversations. This method of ongoing PD with reflection and targeted feedback is important when engaging children who require intensive language support in interactive content discussions...

In conclusion, findings from the present study suggest that when designing future interventions intended to improve children's literacy and language achievements in preschool settings, researchers must pay significant attention to the skills of the teachers delivering the curriculum (Hamre et al., 2009) in addition to the design and use of scientifically based instructional materials and practices.

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