

The Research Behind *Story Friends*

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Overview

Story Friends is a supplemental curriculum for teaching preschoolers and some kindergartners challenging academic vocabulary, basic concept words, and how to answer questions about stories. Although the curriculum may have widespread appeal to all preschoolers, these stories with embedded lessons were designed to promote language development among children who are at risk for later reading problems because of their weak language skills. Thus, our research focused on effects of the curriculum with at-risk prekindergarten (pre-K) populations. Because the stories and lessons are delivered using audio recordings, *Story Friends* can easily be implemented to small groups of children by teacher assistants or other paraprofessionals. Teachers or other professional staff members are provided tools to help with the selection of students and the monitoring of instruction and children's progress, and *Story Friends* contains a

framework for deciding who should be receiving instruction with and without other modifications. Two book series totaling 26 books offer children interactive instruction for one book per week, 10–15 minutes per day. This is sufficient to provide children with many opportunities to learn vocabulary and comprehension skills that will help prepare them for later academic success.

Program Foundation

Children enter early childhood programs with diverse early language and literacy experiences. A substantial number of children, especially many children growing up in low-income homes, have limited oral language skills that place them at risk for later reading disabilities. For example, Qi, Kaiser, Milan, and Hancock (2006) reported that preschoolers enrolled in Head Start scored an average of approximately 1.5 standard deviations below the normative mean on a standardized measure of receptive vocabulary, the Peabody Picture Vocabulary Test–Third Edition (PPVT-III; Dunn & Dunn, 1997). Preschool children with limited oral language skills, including vocabulary, are at risk for reading disabilities in later school years (National Early Literacy Panel, 2008). Students who fall behind their peers in language and literacy development often continue to struggle throughout the school years (Foster & Miller, 2007; National Center for Education Statistics, 2014). Thus, there is a need for curricula that enhance the language skills of children who demonstrate weaknesses in language development.

Response to intervention (RTI) offers a framework for preventing language and reading disorders. Often called *multi-tiered systems of support* (MTSS), the RTI or MTSS approach is a multitiered instructional framework that seeks to provide high-quality instruction to students with a range of needs and to monitor children's learning progress (Greenwood et al., 2012). MTSS seeks to promptly identify children who are falling behind their peers developmentally

and then to provide them with instruction that is sufficient for them to catch up. Applications of tiered intervention models, particularly in the area of reading instruction, have been shown to be more effective than traditional approaches (e.g., O'Connor, Harty, & Fulmer, 2005). The MTSS model provides instruction in the students' least restrictive environment, consistent with federal special education mandates (Barnett, VanDerHeyden, & Witt, 2007). In theory, by providing high-quality instruction to all students before they fall behind, the number of students labeled with a disability will decrease (Fuchs & Fuchs, 2006).

MTSS typically is represented graphically as a triangle or a pyramid divided into three or more tiers (e.g., Fletcher & Vaughn, 2009). These tiers signify levels of increasingly intense instruction (moving up the triangle). Fewer children within a classroom are expected to need more intense instruction moving up the triangle. Thus, the lowest level of instruction (Tier 1) represents the general education curriculum that applies to all children. In contrast, the peak of the triangle (Tier 3) represents the most intense, individualized services, which is reserved for those few children for whom other services did not result in adequate progress. Between Tiers 1 and 3 is a secondary tier of instruction, intended for children who need additional support (Gersten et al., 2008). Children whose progress in Tier 1 does not meet an expected level based on screening and progress monitoring data should receive daily small group instruction (i.e., Tier 2; Fletcher & Vaughn, 2009). Thus, the *Story Friends* approach was developed primarily as a Tier 2 intervention for children demonstrating delays in oral language development.

Pedagogical Approach

Story Friends is an evidence-based early language curriculum that specifically targets vocabulary development; basic concepts; and

an important component of comprehension, answering inferential questions about stories. *Story Friends* was developed as an easy-to-implement standard treatment protocol delivered to small groups, which also can be adapted for individualized intervention for preschool students. This supplemental curriculum was designed specifically for school personnel to implement in an MTSS framework.

Within the broad domain of oral language, we identified two primary areas for intervention: vocabulary and comprehension. Our first presumption was that teaching vocabulary and comprehension could be accomplished in the context of a commonly accepted preschool activity: storybook reading. This decision was based on the substantial evidence that instruction embedded in storybooks could be effective in teaching oral language skills to children (Coyne, Simmons, Kame'enui, & Stoolmiller, 2004; Ezell & Justice, 2005; Whitehurst et al., 1994; Ziolkowski & Goldstein, 2008). Although reading to students is commonplace in most preschools, there is little reason to assume that reading, even when accompanied by large or small group discussions with the children, is sufficient to greatly expand children's vocabularies and story comprehension skills. Nevertheless, the storybook context likely would be perceived positively and facilitate intervention adoption in pre-K and kindergarten settings.

A second presumption was that implementation of a Tier 2 curriculum needed to be feasible and usable in a variety of early childhood education (ECE) settings. In the context of an MTSS model, it is important to consider the demands placed on educational staff to implement multiple tiers of intervention in several domains with high treatment fidelity (Ukrainetz, 2006). Given the demands of ECE settings, the variability in the preparation of early childhood educators, and the limited time available for preparing and delivering explicit instruction, a number of design constraints

need to be considered. Thus, the design of *Story Friends* was based on the premise that early childhood teachers need a curriculum that does not require extensive time for training, preparation, or implementation.

The use of recorded storybooks is a common practice, and many classrooms already have a “listening center” in place. However, exposure to books alone does not produce efficient learning of vocabulary. Therefore, it is important to provide each child who needs supplemental instruction with many opportunities to respond within an easy-to-implement enhancement on the typical preschool day. This need is met through an automated format for delivery of the curriculum. Prerecorded audio files of the story text and embedded instruction allow children wearing headphones to listen to the audio in small groups. This automated format lessens the planning burden for teachers because it reduces the variation in teachers’ ability to select words, generate child-friendly definitions, and develop story contexts for teaching vocabulary. Plus, aides or volunteers can implement the curriculum with high fidelity in ECE settings. The prerecorded books with embedded lessons help ensure consistent delivery and dosage of instruction. That is, each child, equipped with a book and headphones, receives specific lessons and multiple opportunities to respond. However, adults do more than simply push *play*. We have found that an adult facilitator needs to keep children on the right page and to encourage responding. However, an adult with minimal training, rather than a highly skilled teacher, could facilitate this type of small group instruction because carefully designed instruction is provided in the prerecorded audio.

Thus, we developed, tested, and refined a supplemental language curriculum in which instruction teaches relevant skills, produces learning efficiently, and can be implemented easily by adults with varying levels of teaching skills. Storybooks were created to meet these design characteristics:

- Books are appealing to young children and their teachers.

- Each book series has a recurring cast of characters, thus reducing demands on learning background information in single books.
- A few appealing characters per book series are depicted in colorful illustrations.
- Each page includes rhyming text to facilitate learning of an aspect of phonological awareness.
- Stories provide a rich context for embedded intervention on vocabulary and comprehension.
- Vocabulary and linguistic complexity, as well as the number of pages, is controlled and consistent.
- Child-friendly themes and morals provide a basis for each story.

The *Story Friends* curriculum was developed by the Center for Response to Intervention in Early Childhood (CRTIEC), a multisite collaborative project funded by the Institute of Educational Sciences. This intervention has been used successfully in multiple research studies with pre-K students who are at risk for reading disabilities due to delays in vocabulary development. Previous research has found that students vary in their daily language exposure and that many children benefit from explicit instruction on vocabulary words and comprehension strategies. As discussed below, using Individual Growth and Development Indicators (IGDIs, McConnell, Bradfield, Wackerle-Hollman, & Rodriguez, 2015) and teacher questionnaires, children who require extra support can be identified as potential candidates for intervention.

Students who benefit most from *Story Friends* instruction are those who are not sustaining typical growth in the areas of language and literacy. Students selected for participation in previous studies are children demonstrating language delays on both IGDIs. The IGDI 2.0 Picture Naming and Which One Doesn’t Belong subtests, along with a teacher questionnaire, have been shown to be effective in identifying preschoolers who demonstrate delays in vocabulary

and comprehension skills but have sufficient core vocabulary to understand the definitions and the stories (Bradfield et al., 2013). At 3-week intervals and after a review book, unit tests provide performance data for informing the MTSS framework and determining whether adjustments to the tiers of instruction are warranted. For example, a child who is able to define all or most of the challenging words and answer inferential questions would not be considered a high priority for continuing to receive *Story Friends*. Alternatively, a child who is unable to define any or few of the challenging words or answer inferential questions might benefit from an individualized adaptation of *Story Friends* or from instruction on a less advanced set of language goals.

The *Story Friends* curriculum consists of a total of 26 storybooks (two sets of 13). Each child has a book because the books have interactive activities, such as flaps that children lift to reveal answers to questions. Typically, groups of three children listen simultaneously to each automated storybook three times per week, with each lesson lasting approximately 10–15 minutes. Each set (*Jungle Friends* and *Forest Friends*) has one introductory book, nine books with new vocabulary and comprehension content, and three review books. Children are led through the stories by “Wanda the Word Wolf,” who narrates the book, defines the vocabulary and basic concept words, provides opportunities for practice, and asks comprehension questions that allow children to apply concepts from the stories to their own lives. Children learn two new challenging academic words and one or more basic concept words per story and have opportunities to practice these newly learned words at the end of each book. The books are organized into units of three stories. Thus, children listen to three books and then listen to a fourth book that reviews the words that were taught previously.

Research

Although many curricula claim to be evidence-based, few have conducted multiple studies to

inform the curriculum development process and systematically scaled up the research to ensure that intervention effects are replicated in authentic classroom contexts. This research overview summarizes much of the research conducted thus far that has built a strong evidence base for the *Story Friends* curriculum. In addition to initial pilot work, five experimental studies using the *Story Friends* curriculum were conducted between 2010 and 2014.

1. Spencer et al. (2012) reported the results of an early efficacy study of this embedded vocabulary intervention. A repeated acquisition single-case experimental design across instructional targets was used. Robust experimental effects were replicated across nine children in public pre-K classrooms serving low-income families.

2. A subsequent study (Kelley, Goldstein, Spencer, & Sherman, 2015) used a small n group design and an embedded single-case experimental design. Eighteen participants were randomly assigned to treatment (nine books in the fall) or delayed treatment (nine books in the spring) within classrooms. Even stronger evidence of efficacy was demonstrated in this study. Large effect sizes were evident across the three units (range, $d = 1.37$ – 2.62). Improvements in vocabulary knowledge were demonstrated in 58 of 81 possible demonstrations of treatment effects. On average, children in the treatment group learned approximately 52% of the words compared to 5% for the comparison group. The results on Assessment of Story Comprehension were not as impressive, overall; however, a large effect size was seen at posttest for the inferential questions ($d = 1.10$).

3. These results were replicated in a study that was conducted in Kansas City at the same time (Greenwood et al., in press). This study focused on children’s responses to the narrator’s prompts. They found that children improved in their proficiency in responding to the prerecorded narrator. These improvements in correct responding to teaching prompts were associated with increases in word learning.

4. Goldstein et al. (in press) reported on a large-scale study with teaching staff implementing the *Story Friends* curriculum. This multisite study included 195 students in 32 classrooms across two states. Classroom–student clusters were randomly assigned to one of the two conditions. In the experimental condition, the storybooks and audio included embedded lessons on challenging vocabulary words and comprehension questions. In the comparison condition, participants were exposed to the same stories with the targeted vocabulary words included but with no embedded lessons. To identify participants, we considered information from the Picture Naming and Which One Doesn't Belong IGDIs and teacher nomination on Teacher Questionnaires. Children with low scores on one or both IGDIs also were given the PPVT-4.

Learning of instructional targets was assessed using two curriculum-based measures referenced to the new content taught: Unit Vocabulary Tests and the Assessment of Story Comprehension (ASC, T. D. Spencer, Goldstein, Kelley, Sherman, & McCune, 2015). Children in both conditions showed little knowledge of the novel words at pretest. This did not change at posttest for the comparison group after being exposed to the words in story contexts. However, word learning was quite evident at posttest for the experimental group. After controlling for pretest vocabulary scores and Clinical Evaluation of Language Fundamentals (CELF-P2, Wiig, Secord, & Semel, 2004) scores, a large effect for group was evident (Cohen's $f^2 = .70$). Overall effects for the ASC were not significant in this study. This study contributes greatly to the internal validity of findings because the basis of comparison was listening to books with the targeted vocabulary included. Vocabulary learning associated with embedded learning was shown along with a large effect size. It also contributes to the external validity of our findings, because teachers were responsible for implementing the curriculum. They did so with excellent treatment fidelity and with high consumer satisfaction.

A second cluster-randomized design, using ECE teachers as implementers, was conducted

recently with 39 child care centers in three states. In this study, students were randomized to an embedded vocabulary condition (*Story Friends*) or a phonological awareness condition. Children in both groups were provided instruction for approximately 15 minutes per day for approximately 12 weeks. Teachers in ECE centers were trained by research staff to implement the interventions, and coaching support was provided on a weekly basis. Fidelity observations indicated a high degree of fidelity to each program with little researcher support. Despite minimal training and classroom support by research staff, previous results were replicated. Children learned an average of 46% of 18 challenging target words over the course of the 12-week intervention versus 7% for the comparison group.

In summary, the five studies conducted between 2010 and 2014 allowed us to evaluate and refine the *Story Friends* curriculum. Kelley and Goldstein (2014) provide a more complete overview of curricular development process. Refinements in the curriculum were based on careful analyses of students' learning across sites. These changes have produced more robust learning by preschoolers, especially for the learning of academic vocabulary. Moreover, we have consistently found that the *Story Friends* curriculum was easy to implement, worked well with current class curricula, and resulted in substantial word-learning gains even when children are exposed to the words in story contexts but without the embedded lessons. The long-term effects of this curriculum have yet to be investigated experimentally (although preliminary results from kindergarten readiness tests look promising). Because vocabulary development is clearly implicated in later reading fluency and comprehension, longitudinal studies are needed to determine long-term effects on later reading development.

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