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Effects of three early literacy interventions in the preschool classroom: comparing phonological awareness training, dialogic reading, and a combination condition in small groups

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EFFECTS OF THREE EARLY LITERACY INTERVENTIONS IN THE
PRESCHOOL CLASSROOM: COMPARING PHONOLOGICAL
AWARENESS TRAINING, DIALOGIC READING,
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Abstract

Phonological awareness, oral language, alphabet knowledge, and print awareness are the building blocks for emergent literacy. These skills can be divided into embedded and explicit domains of early literacy interventions. Dialogic reading, a well-researched embedded method of reading intervention, incorporates oral language and print awareness through adult-child storybook reading. Phonological awareness interventions utilize explicit skills such as phonemic instruction and letter knowledge to increase early literacy. The current study examined three early literacy interventions, dialogic reading, phonological awareness, and a combination condition, in comparison with each other and a control condition. Thirty-seven preschool children were randomly assigned to a condition and interventions were carried out in small groups for four weeks. Each child was assessed using measures of letter naming, initial sound, and word use prior to and following the investigation along with two progress monitoring assessment sessions equally spaced during the study. Results offered evidence to support significant changes in early literacy skills over a short period of time as well as underscoring the benefits of regular progress monitoring with preschool age students. Future research is needed to examine these treatment conditions for a longer period and include follow-up data in order to examine whether one proves to be superior in increasing early literacy skills.

Introduction

Literacy is a keystone skill for participation in the economic, social, and civil dimensions of modern information age societies. Research has demonstrated that children enter on to a path of literacy success or failure relatively early in their development. Children entering kindergarten with less well-developed reading skills than those of their peers tend to fall further behind as they move through elementary school (Good, Simmons, & Smith, 1998). The importance of this entry phenomenon is further highlighted by numerous studies demonstrating the stability of students' reading status through the elementary school years (Good et al., 1998; Juel, 1988; Lonigan, 2006; Wagner, Torgesen, Rashotte, Hecht, Barker, & Burgess, 1997). Environmental supports that lead to the development of language and early literacy skills are a critical feature of a successful preschool developmental experience (Mashburn, 2008).

The importance of preschool experience is further highlighted by research showing that without appropriate intervention, the gap between children with high reading skills and those with low reading skills grows exponentially throughout elementary school (Good et al., 1998; Juel, 1988; Lonigan, 2006). In order to catch up with their peers, the children ranking in the lower percentiles must progress at a more rapid rate than their higher performing peers (Good et al., 1998). This adverse phenomenon can be diminished with appropriate early intervention that will only require the children with the poorest skills to progress at rates similar to other children (Lonigan, 2006). The importance of effective preschool intervention and instruction is further highlighted by findings that 20-30% of children are at-risk for reading difficulties in the domain of emergent literacy skills (Otaiba & Fuchs, 2002). It may be possible to reduce this percentage to 5% with appropriate instruction or early intervention (Snow, Burns, & Griffin, 1998). Most children will respond to the teacher directed instruction in the normal classroom setting but a percentage of them will fail to

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advance with normal instruction (Justice & Kaderavek, 2004). Those children will need some further intervention.

The early literacy skills required for successful development of reading in elementary school are oral language, phonological awareness, alphabet knowledge, and print awareness (National Reading Panel, 2000). The development of oral language includes increasing the child's vocabulary as well as the expressive and receptive language. A child with phonological awareness skills will have the ability to recognize sound structures within oral language (Lonigan, 2006). Print knowledge refers to the child's awareness of how print is read and how it can be utilized to convey a thought. The "Big Four" skill areas, as they have been labeled, can be divided into explicit and embedded dimensions of early literacy (Christie, 2008; Justice & Kaderavek, 2004). Phonological awareness and alphabet knowledge comprise the explicit domain while the embedded dimension consists of oral language and some aspects of print awareness. Print awareness can fall into both the embedded or explicit categories depending on the specific skill being taught and manner of instruction (Cabell, Justice, Vukelich, Buell, & Han, 2008). For the purposes of this study, print awareness will refer to a child's interaction with print through story-telling, falling into the embedded dimension of early literacy. In order to increase the explicit skills, interventions are commonly taught using direct, systematic instruction (National Reading Panel, 2000) while embedded skills often come from shared reading activities (Cabell, et al., 2008; Justice & Kaderavek, 2004).

Activities using storybook reading between an adult and child are found in homes and classrooms everyday (McKeown & Beck, 2006) but the addition of interactive talk creates an intervention entitled dialogic reading (Zevenbergen & Whitehurst, 2003). When utilized in a small group format in the preschool classroom, it can be an efficient way to increase literacy skills

(Morrow & Smith, 1990). Alternatively, research has more recently been evaluating the benefits of direct instruction on phonological intervention in the preschool classroom. The combination of phonemic instruction and alphabet awareness has demonstrated positive effects for future reading success (Blachman, Tangel, Ball, Black, & McGraw, 1999; Lonigan, 2006). While combining storybook reading and phonological awareness appears to create a "best of" type of intervention, it also creates the possibility of an intervention too extensive to be of use in a preschool classroom (Aram & Biron, 2004; Justice, Kaderavek, Bowles, & Grimm, 2005). Research has recently begun to explore the possibilities that surround this challenge.

The following review will summarize studies analyzing the effects of dialogic reading, phonological awareness instruction, and studies combining these two interventions. Information on the importance of progress monitoring in research and practice will also be presented. The current study will address three methods of early literacy intervention by examining dialogic reading, phonological awareness, and a combination of those two popular methods in order to offer preschool teachers a sound, short-term intervention for increasing emergent literacy skills.

Early Literacy Interventions

Whitehurst and Lonigan (1998) reviewed the emergent literacy research and summarized early literacy skills as falling within two broad domains: outside-in and inside-out. The review examined the dimension of emergent literacy and how the skills sets within those domains contribute to future reading success. Outside-in skills include language, narrative, conventions of print, and emergent reading. Interventions to increase this skill set utilize oral storybook reading as a main component. Outside-in skills later develop into reading comprehension and meaning-based literacy skills (Cabell, et al., 2008). Inside-out skills consist of knowledge of graphemes, phonemic awareness skills, syntactic awareness, and phoneme-grapheme correspondence. These skills are often placed under the umbrella term of phonological awareness (Lonigan, 2006). Storybook reading, and variations upon it, has emerged as the preeminent outside-in methodology and research examining that approach is summarized below.

Storybook Reading

The dominant traditional approach to literacy involves the simple act of sitting down and reading a book to a child (McKeown & Beck, 2006). Research has found this simple event to be an effective way of promoting early literacy and recently researchers are identifying this as an essential part of increasing embedded literacy skills (Cabell, et al., 2008). Embedded literacy instruction models emphasize having written language embedded within the child's day and the interactions with print that are naturalistic and child-initiated (Justice & Kaderavek, 2004). An important goal in an embedded literacy intervention is for the adult to serve as facilitator in the child's discovery of literacy (Justice & Ezell, 2002; Watkin & Bunce, 1996).

Researchers have found that reading aloud with children is helpful in developing their literacy skills (McKeown & Beck, 2006), however, analyses have disagreed on the exact impact of

reading aloud and what factors are most important to create language growth. For example, the conclusions reached by Bus, van Ijzendoorn, and Pellegrini (1995) contradicted those reached in a review by Scarborough and Dobrich (1994). Bus and colleagues conducted a meta-analysis of 33 studies examining the effects of parent-child storybook reading and found a moderate to high relationship in the areas of emergent literacy and language acquisition. Scarborough and Dobrich (1994) found a small correlation in their review of studies in which parents read aloud to their children. The divergence in the results may be attributable to the variability surrounding the content of these parent-child interactions, the books available, the language level at home, and parental literacy skills. Studies examining the impact of reading aloud within the classroom rather than within the home, demonstrated that the type and extent of talk surrounding the story interaction is critical to the impact of shared reading on literacy and language development (McKeown & Beck, 2006).

Interactive Talk. Interactive talk incorporated into storybook reading was examined by Reese and Cox (1999). The authors examined three types of storybook reading styles in the preschool classroom. The describer style focused on describing and labeling pictures. The comprehender style focused on the story meaning and predictions of story events. The performance-oriented style discussed the book only before and after the reading. Forty-eight preschool students each experienced one of the three interventions for a 6-week period and the participants were assessed prior to and following intervention on measures of early literacy skills. The findings identified the describer style as the condition with the greatest overall benefits, specifically in vocabulary and print skills. These findings support the use of interactive storybook reading, especially when the intervention involves the description of images throughout the book.

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A longitudinal study by Dickinson and Smith (1994) also investigated three similar styles of reading aloud. They observed book reading in twenty-five preschool classrooms and coded the specific kinds of talk occurring during the book reading activities. Based on the information gathered, three styles of reading were identified: co-constructive, didactic-interactional, and performance. The co-constructive style involved challenging conversations held between teachers and children, especially during the book reading. The didactic-interactional style was characterized by story recall and prediction done during the reading period. The performance style was exhibited by the reading of books without much talk during the story and most of the discussion occurring before and after the reading. The children were assessed one year later and the researchers examined the assessment results relative to the type of reading style used in the classroom. The amount of child-involved analytic talk occurring during the story reading was found to have a strong effect on vocabulary no matter which reading style was employed. This study reinforces previous research in finding that interactive adult-child talk during storybook reading is essential but furthers the research by asserting that the reading style in insignificant in achieving literacy benefits (Reese & Cox, 1999).

Small Group Instruction. Research has demonstrated that small group instruction is not only effective, but may actually be more beneficial than individual instruction for some dimensions of emergent literacy (Morrow & Smith, 1990). Morrow and Smith examined student listening to stories during a whole class setting, in a small group (three children) setting, and individually. The children were examined with free and probed recall after each reading session. Although more questions were asked by children during the individual sessions, recall was higher in the small group setting than both whole class and one-on-one. This research strengthens the use of interactive storybook reading and reinforces the findings by the National Reading Panel (2000) that small

group instruction of early literacy is often more effective than either whole-class or individual instruction.

Dialogic Reading. Zevenbergen and Whitehurst (2003) utilized interactive storybook reading in the development of their dialogic reading intervention. This intervention includes modeling, content questions, as well as eliciting descriptions and feedback during adult-child storybook reading. The adult elicits responses from the child through open-ended questions, fill-in-the-blank questions, and recall prompts. As the child responds to the story, the adult praises correct answers, makes corrections, expands upon the child's responses, and encourages further participation. This intervention can be a structured event planned into the child's day or an event that occurs naturally as the child explores their environment. There is flexibility with this intervention in that it can be done one-on-one between adult and child or as a small group with an adult and a few children. It can also be accomplished with many ages as the level of the intervention is easily altered by the reading level of the book and the difficulty of the questions.

Initial research examining the effectiveness of dialogical reading supported both its efficacy and the practicality of training parents to use it (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Whitehurst et al., 1988). Arnold and colleagues (1994) examined mother-child dyads from middle-upper SES families and demonstrated that mothers could successfully learn to implement dialogical reading procedures through multiple training formats. Both Whitehurst and colleagues (1988) and Arnold and colleagues (1994) found that a dialogic reading intervention produced large gains in children's language skills that were superior to the control group. In addition, children of the video trained mothers achieved higher scores than those of the direct training mothers showing that the dialogic reading techniques can be easily trained without sacrificing results.

Crain-Thoreson and Dale (1999) examined the degree to which the dialogical reading procedures per se versus simply reading with an adult are important in a study examining reading skills in children with language delays. Children assigned to the control group read individually with a staff member from their school but no dialogic reading tactics were employed. In the staff instruction group, the children and staff utilized dialogic reading in their reading sessions. The children assigned to the parent group experienced parent instruction with dialogic shared book reading. All groups included some type of adult reading instruction which is indicative of why children in all 3 groups spoke more, made longer utterances, produced more different words, and participated more in shared book reading. The magnitude of change in the children's linguistic performance from pre to posttest was positively correlated with the magnitude of change in adult behavior. This study supports dialogic reading as a means to increasing one-on-one reading interactions between adults and children.

Aspects of storybook reading such as the talk that accompanies the story, the quality of the talk, and the support the adult provides during the reading interaction have been shown to be as important as the act of reading to child (Crain-Thoreson, & Dale, 1999; Dickinson & Smith, 1994; Reese & Cox, 1999; Whitehurst & Lonigan, 1998). Encouraging findings have been discovered in both home and school-based interventions but classroom instruction seems to provide more reliably positive results (Crain-Thoreson & Dale, 1999; Whitehurst, et al., 1999). One promising conclusion of the research on interactive storybook reading is the ease of training and use of the instruction, particularly the dialogic reading program (Dale, et al., 1996; Whitehurst et al., 1988). This variable can make storybook reading interventions more attractive to researchers and teachers alike. Research continues to support basic book reading as an effective early literacy intervention but

acknowledges that simply reading aloud may not be the only intervention necessary for many children (McKeown & Beck, 2006).

Explicit Instruction

Interventions utilizing inside-out literacy skills emphasize adult-directed instruction that is structured and aimed at the development of discreet skills (Cabell, et al., 2008). The child's exposure to print is less naturalistic than storybook reading and focuses more on basic literacy skills. Interactions between adult and child are directed at purposeful instructional opportunities for emergent literacy skills. These opportunities include adult modeling and demonstration, specific elicitations, and repeated guided practice (Justice & Kaderavek, 2004). This type of instruction lends itself to interventions aimed at increasing phonological awareness and specific early literacy skills. The research presented here will examine studies utilizing explicit approaches to intervention, specifically how they can be used to increase phonological awareness skills.

Phonological Instruction. The term phonological awareness is used to describe "the ability to detect or manipulate the sound structure of oral language" (Lonigan, 2006, p.78). There are three common ways of breaking up words into sounds, hence three areas of phonological awareness. These areas are syllables, intra-syllabic units (onset and rime), and phonemes (Goswami & Bryant, 1990). The easiest and most recognized of these three is to break a word into its syllables. Since young children often use only monosyllabic words, it is important to teach ways to break up these words. The following research examines the role of phonological awareness in literacy development and types of interventions which include phonological awareness and other inside-out skills.

Research examining multiple dimensions of phonological awareness has demonstrated that it is possible to distinguish multiple dimensions of phonological awareness and that children

younger than 3 years of age can demonstrate phonological awareness (Lonigan, Burgess, Anthony, & Barker, 1998). Lonigan and colleagues examined children between the ages of 2 and 5 years on an assessment battery including four phonological tasks: rhyme oddity detection, alliteration oddity detection, blending, and elision. Results from the multiple assessments concluded that levels of phonological skills are not steady with age but increase significantly as the child gets older. One important finding was that a number of children in the 2-3 year age range were able to demonstrate phonological sensitivity at all linguistic complexities. This study reinforces findings from other studies that state that it is possible to measure phonological awareness in preschool children (Bryant, MacLean, Bradley, & Crossland, 1990, Wagner & Torgesen, 1987).

Blachman, Tangel, Ball, Black, and McGraw (1999) demonstrated that direct instruction in phonemic awareness and word recognition skills lead to sustained literacy gains. The children in the treatment condition experienced eleven weeks of phonemic awareness training during kindergarten and an explicit reading instruction program during their first grade year. The children in the control condition experienced the standard reading program delivered by the school district. The children were assessed on measures of phoneme segmentation, letter names and sounds, word identification, syllable detection, and spelling. The treatment group surpassed the control group on measure of letter names and sounds, word recognition, phonological awareness, and spelling when assessed following first grade. In the post second grade assessment, the treatment group continued to outperform the control group on the spelling and reading measures but not the other assessment measures. The results of this research are important in showing that phonemic awareness training can benefit both reading and spelling, even a year following intervention.

Letter Knowledge. Alphabetic knowledge is just as important to emergent literacy as phonological awareness (Lonigan, Burgess, & Anthony, 2000; Storch & Whitehurst, 2002).

Research has shown that the most effective early literacy programs provide a balance of letter knowledge and phonemic instruction (Lonigan, 2006). A meta-analysis by the National Reading Panel (2000) found that interventions teaching phonological awareness were much more effective when taught using letters than those that taught through speech alone. Share, Jorm, Maclean, and Matthews (1984) examined this phenomenon by taking numerous assessment measures at kindergarten entry and comparing that data with the children's reading at the end of kindergarten and first grade. They found that phonemic awareness and letter knowledge were the best predictors of future reading.

A study supporting the combination of phonological awareness and letter knowledge was completed by Lonigan, Burgess, and Anthony (2000). Assessments included combinations of measures for oral language, letter knowledge, print concepts, and phonological sensitivity. These testing batteries resulted in the finding that, when taken together, phonological sensitivity and letter knowledge account for 54% of the variance in the decoding abilities of kindergarten and first grade students. The authors concluded that these findings are similar to past studies which have also found that a predictive relationship exists between phonological sensitivity and later letter knowledge as well as between letter knowledge and current and subsequent phonological sensitivity (Bowey, 1994; Burgess & Lonigan, 1998; Wagner, Torgesen, & Rashotte, 1994).

Earlier findings (Lonigan et al., 2000) were replicated and extended by Storch and Whitehurst (2002). Their results provide evidence that code-related skills (phonological awareness) and oral language have a strong relationship in preschool and these skills continue to be stable over time. This study also reports that children's reading level in early elementary is strongly influenced by their code-related skill level from preschool and kindergarten. The findings from both studies underscore the developmental continuity between early preschool literacy skills and early

elementary reading abilities. One particular finding of interest from Lonigan and colleagues (2000) is that phonological sensitivity skills are highly stable from late preschool into early elementary years but are much less stable from early to late preschool. Intervention efforts designed to identify and change this variability should be directed toward children in their preschool years (Lonigan et al., 2000).

Classroom Interventions. Byrne and Fielding-Barnsley (1991) examined effects of phoneme instruction for preschool children given the same general instruction with differing emphasis on phonological activities. The control group experienced storybook reading and activities involving posters and worksheets. The children in the phoneme group experienced a similar intervention but the stories, posters, and worksheets focused on a specific phoneme in either the initial or final position. Results found that the experimental group showed larger gains on the post-test than the control group and those improvements generalized to sounds not included in the instructional program.   Byrne and Fielding-Barnsley (1995) extended their prior study by assessing the children that remained in the district from each group at the end of first grade and the end of second grade. A primary finding from this study was the increased knowledge of decoding shown by the children from the experimental group during the reading pseudo-words tasks. This is significant as there is a correlation between pseudo-word reading and irregular word reading (Freebody & Byrne, 1988). The experimental group also showed superiority in reading comprehension as compared to the control group which supports previous findings that reading comprehension is dependent on a child's decoding skills (Hoover & Gough, 1990).

In an extensive study of inside-out literacy skills, Torgesen, Wagner, Rashotte, Rose, Lindamood, Conway, and Garvan (1999) contrasted three different interventions with children exhibiting early literacy deficits. The conditions varied in degree of phonological awareness

instruction and coordination with the natural classroom environment. Participants were assessed on measures testing letter naming, phoneme elision, serial naming of numbers, and vocabulary throughout the intervention. The children were assigned to one of four conditions: (1) no-treatment control, (2) regular classroom support (RCS), (3) embedded phonics (EP), and (4) phonological awareness plus synthetic phonics (PASP). The PASP condition spent the majority of time on phonemic decoding whereas the EP condition split the time spent on those two activities almost evenly. In the RCS condition, the one-on-one tutoring was closely coordinated to the activities already existing in the classroom. Results showed that the children participating in the PASP condition had significantly better skills in phonological awareness, phonemic decoding, and untimed word reading than the children in the EP condition. Only the PASP condition produced reliable results in word level reading skills. The growth produced by the RCS and EP conditions was not reliably different from the no-treatment group. One explanation for this finding is that one-on-one tutoring is not sufficient to produce reliable results in children with serious reading disabilities unless it included intensive explicit instruction in phonemic awareness and decoding skills. There was no significant difference between the treatment groups on measures of comprehension, which the authors regard as the most important outcome of reading instruction. These results were similar to a study by Brown and Felton (1990) who also found increases in word level skills but no significant differences in reading comprehension. These two studies reinforce the importance of creating early literacy interventions that incorporate numerous inside-out skills including word level and comprehension related skills (Torgesen et al., 1999).

A meta-analysis by the National Reading Panel (2000) suggested a strong causal relationship between phonemic awareness and reading acquisition. Other researchers have examined this issue and reported similar results supporting phonological awareness leading to

reading accuracy (Burns, 2003; Camilli, Vargas, & Yurecko, 2003). Although the research has

identified the importance of phonological awareness, it has also supported other forms of reading

interventions. Based on studies devoted to this topic (Dickinson, McCabe, & Essex, 2006; Ehri &

Roberts, 2006; Justice & Kaderavek, 2004; Phillips & Torgesen, 2006; Whitehurst & Lonigan,

1998), the consensus appears to be that phonological awareness is necessary but not sufficient to a

child's emergent literacy (Lonigan, 2006; Phillips & Torgesen, 2006). Castles and Coltheart (2004)

reviewed an extensive body of longitudinal studies examining the relationship between

phonological awareness and reading. Their overall finding was that there is not enough evidence to

support a causal link between the two. No study has been able to fully isolate phonological

awareness and its effect on reading (Phillips & Torgeson, 2006). According to Lonigan (2006),

"skilled reading is a complex task that requires the coordination and interaction of many skills (p.

79).

Combination Literacy Interventions

The goals of any emergent literacy intervention are to increase the skills necessary to

strengthen future reading development as well as to increase the child's positive regard for literacy

and likelihood of benefiting from reading in the future (Justice & Kaderavek, 2004). These two

aspects of intervention are not always easily combined into an effective intervention (Justice &

Pullen, 2003). This concern was touched upon by the National Research Council report that low

motivation or interest in reading is one of the three basic impediments to becoming a successful

reader (Snow, et al., 1998). Identifying the best literacy strategy for a specific child is the most

likely way to effectively increase both literacy and interest (Lonigan, 2006).

Justice and Kaderavek (2004) introduced two types of preschool literacy interventions,

embedded and explicit, which mirror the outside-in and inside-out literacy domains introduced by

Whitehurst and Lonigan (1998). An embedded model of intervention includes shared storybook reading, story retelling, or dialogic reading and is geared toward developing outside-in emergent literacy skills. An explicit intervention consists of exercises to increase letter naming, letter sounds, and phonological awareness. This intervention aims to increase the child's ability to decode text and other inside-out skills (Whitehurst & Lonigan, 1998; Justice & Kaderavek, 2004).

Justice and Kaderavek (2004) developed an embedded-explicit model of intervention for emergent literacy skills in the preschool classroom based upon an analysis of prior research. In this article, the authors explain the advantages of using an explicit-embedded model in a preschool classroom and describe in detail how to create such a setting, especially how to utilize auxiliary personnel in the classroom. This model derives in large measure from a prior trial of explicit-embedded instruction (Justice, Chow, Capellini, Flanigan, & Colton; 2003). The authors compared an experimental explicit intervention to a comparison embedded method. The experimental explicit intervention program covered name writing, alphabet recitation, and phonological awareness during each session while the embedded intervention program involved adult-child shared storybook reading and story retelling. Assessments measured alphabet knowledge, print awareness, name writing, phonological segmentation and rhyming. Over the entire 12 week study, significant growth was shown across all five measures for the experimental explicit embedded intervention whereas the comparison embedded intervention only showed significant growth in phonological segmentation only. These findings support the use of explicit emergent literacy skill interventions in enhancing future literacy in children. Based on these results, the authors predict that a combination intervention would be most beneficial in increasing early literacy skills.

Justice, Kaderavek, Bowles, & Grimm (2005) further tested the hypothesis that a combination intervention would be most beneficial. In this study they examined a combined

phonological awareness and storybook intervention. Half the group of parent-child pairs was assigned to a phonological awareness condition in which the adult engaged their children in tasks involving rhyming and beginning sound awareness following a storybook reading. The remainder of the participating pairs completed the same storybook reading but followed it with a vocabulary task. Results from pre and post intervention assessments showed that participation in parent-guided phonological awareness activities increased rhyme abilities in the children but did not create significant gains in any other assessed skill. A positive feature was that the parents and children both viewed the interactive storybook reading intervention favorably which lead to high fidelity in the implementation of the intervention, a topic that has generally been neglected (Justice, et al., 2005; Kaderavek & Sulzby, 1998a).

Dialogic reading paired with letter and sound instruction has also been examined in a combined home and classroom procedure (Whitehurst, Epstein, Angell, Payne, Crone, & Fischel, 1994). The authors examined a dialogic reading program with preschoolers in Headstart. The children assigned to the intervention condition received dialogic reading, at home and in the classroom, as well as additional instruction in letter and sound awareness in the classroom in addition to the basic Headstart procedures. The children in the control condition experienced only the normal Headstart curriculum. The children were assessed pre and post intervention using measured assessing language, writing, print concepts, and linguistic awareness. Results showed a significant improvement in scores in writing and print concepts for the children that participated in the intervention condition as compared to the control. The increase shown in language and linguistic awareness was not significant. The intervention was described as a modest addition to the Headstart curriculum since it involved very little training of teachers and parents and general cost. The authors point out the importance of the results considering the ease and affordability of the

intervention. Subsequent replication with different Headstart centers found the same positive results as the 1994 study (Whitehurst, Zevenbergen, Crone, Schultz, Velting, & Fischel, 1999). These two studies suggest that a combination of letter/sound awareness and dialogic reading can lead to reading gains for economically disadvantaged children. In order to further this line of research, more conditions are required for comparison of the combined condition.

Hatcher, Hulme, and Ellis (1994) extended examination of phonological based instruction to older students by examining a group of seven year olds. The children were assessed prior to and following the interventions with measures testing reading accuracy and comprehension, early word recognition, nonword reading, sound deletion and blending, segmentation, rhyme, and alliteration. The three intervention conditions were a no training control, phonological training alone, reading with phonology, and reading alone. The authors expected to find the highest gains on the measures corresponding to each condition, such as highest reading scores for the reading alone group and higher phonological awareness scores with the phonology alone group. The results indicated the highest scores across the different measures were found in the reading with phonology group. These results demonstrate that even though that particular intervention spent less time with each specific activity, the children learned more and increased their early literacy skills overall with the combination intervention.

The length of time available to implement an early literacy intervention can often be factor in a preschool classroom. Hatcher, Hulme, Miles, Carroll, Hatcher, Gibbs, Smith, Bowyer-Crane, and Snowling (2006) tested the successful combination condition from Hatcher and colleagues (1994) to examine the time required to achieve positive effects. They examined the effects of a literacy intervention teaching phonemic awareness training, text reading, and phonological linkage. The first experimental group received 20 total weeks of intervention occurring in both small group

and individual formats. The second group the same treatment intervention but only for the second

10 weeks of the 20 weeks of the experiment. All children were assessed prior to the initial 20 week

intervention, after the first 10 weeks concluded, and following the 20 weeks of intervention. The

mid-intervention assessment showed the children that had received 10 weeks of intervention were

scoring significantly higher in word reading and phoneme awareness than the group that had yet to

receive intervention. Once the second group received their 10 weeks of intervention, the scores of

the groups were comparable for the final assessment. The small gains of group one during the

second 10 weeks support the findings of the National Reading Panel (2000) meta-analysis. The

review found that gains shown during phoneme awareness training begin to slow down after 12

weeks of intervention. This study demonstrates how a combined phonological awareness and

storybook reading intervention can offer an increase in early literacy skills even when implemented

over a short term.

Another study from this emerging literature base examined the combination of embedded

and explicit literacy models (Aram, 2006). This study continued the work of Aram and Biron

(2004) examining low SES preschool children. It examined a teacher-directed, storybook reading

program that resembled dialogic reading, and an alphabetic skills program focused on phonological

awareness, letter knowledge, and basic writing. The combined program included activities from

both the storybook reading program and the alphabetic skills program. The children were assessed

on measures of name and word writing, letter knowledge, initial letter retrieval, phonological

awareness, receptive vocabulary, and book vocabulary. The study found that the children in the

three intervention programs progressed significantly more than the comparison group on name

writing, letter knowledge, and phonological awareness. The alphabetic skills group exceeded the

other groups in word writing, letter knowledge, and initial letter retrieval and the combination group

was highest in book vocabulary. The author was surprised that the storybook reading group only outperformed the control. This study extends the research in that it examines both embedded and explicit interventions as well as a combination intervention but the results have to be examined cautiously based on the small sample of children involved ($n = 12$).

The embedded-explicit model of intervention is intended to integrate two promising instruction methods to create the most efficient mode for delivering early literacy intervention. The goal is to achieve a maximally effective and efficient intervention for each child and to have the ability to modify that intervention as needed for any specific child (Justice & Kaderavek, 2004). Based on the literature presented, the research to this point does not have a consensus on the advantages of an explicit-embedded combination intervention. The results have varied depending on the specifics of each experiment (Aram, 2006; Hatcher, Hulme, & Ellis, 1994; Hatcher, Hulme, Miles, et al., 2006; Justice, Chow, et al., 2003; Justice, Kaderavek, et al., 2005). The research promotes the benefits of explicit and embedded methods separately and most researchers have assumed that the combination interventions would be the most efficient. Since this area is still a relatively new field of research, not enough studies have been completed to lend support to any one theory.

Progress Monitoring

An essential component of an academic intervention is monitoring the progress of the students in order to modify the program when necessary (Bryan, Ergul, & Burstein, 2008). The Research Institute on Progress Monitoring was created by the Office of Special Education in order to investigate and promote the use of effective progress monitoring systems (Wallace, Espin, McMaster, Deno, & Foegen, 2007). The most dominant result of this research is the creation of a more effective method for classifying children as either low-performing and in need of extra

intervention or requiring a special education label and more intensive services (Fuchs & Fuchs, 2006). A simple advantage to progress monitoring is the ability for teachers to track their students learning and quickly identify which students are in need of extra support (Romain, Millner, Moss, & Held, 2007). By measuring skills frequently and comparing the rates of progress, intervention can be adjusted as necessary (National Center on Student Progress Monitoring).

The use of progress monitoring tools or curriculum-based measures (CBM) has been on the forefront of educational research for more than twenty years (Deno, 1985) but only recently is it being applied to younger children before they enter elementary education (Bryan, et al., 2008). As such, few resources are available for measuring the academic progress of preschool students (National Center on Student Progress Monitoring; Dynamic Indicators of Basic Early Literacy Skills – Good & Kaminski, 2003). Preschool teachers who utilize CBM measures frequently and plot each student's scores graphically are able to watch the growth of each student as well as the entire class. This type of data can be invaluable in identifying how and when to adjust a classroom curriculum or an individual's intervention (Marston, Pickart, Reschly, Heistad, Muyskens, & Tindal, 2007). The DIBELS measures have promoted the use of progress monitoring in the area of early literacy by focusing on three main ideas of early literacy; phonological awareness, alphabetic principle, and fluency (Marston, Pickart, Reschly, Heistad, Muyskens, & Tindal, 2007).

Progress monitoring is not a common element of preschool intervention studies (Bryan, et al., 2008). As shown in the literature presented above, the most frequently employed method is to use pre- and post-test scores to examine the effects of an intervention rather than test throughout the investigation (Blachman, et al., 1999; Dickinson & Smith, 1994; Justice, et al., 2005; Reese and Cox, 1999; Torgesen et al., 1999). As it becomes more commonly used in reading studies for older children, progress monitoring begins to appear more in research with preschool children. Future

research has begun to, and will continue to, look for more methods of assessment and progress

monitoring of early literacy skills (Bryan, et al., 2008).

Purpose of Study

It is important that effective early literacy instruction and intervention be provided to children before they begin to fall substantially behind their peers. Research findings that the children who enter kindergarten behind tend to remain so and that the majority of children with reading problems in first grade will continue to be poor readers in fourth grade are sobering (Good et al., 1998; Lonigan, 2000). There are two dominant approaches to early literacy intervention that have grown to be commonly used interventions: embedded instruction and explicit instruction. Generally shared storybook reading is accepted as the prime exemplar of embedded instruction. By asking content questions, eliciting comments, and offering feedback, the reading process becomes an interactive process (Whitehurst & Lonigan, 1998). This type of instruction has also been described as using an outside-in literacy skills approach. Whitehurst and colleagues have developed a specific model for instruction based on these tasks they describe as dialogic reading. Although research supports the positive effects found from using interactive storybook reading interventions, it has also appears that this one type of intervention may not be sufficient in consistently building early literacy skills across children.

Explicit instruction focused on phonological awareness is a more recently developed instructional method that has developed research support. Interventions targeting phonemic skills can involve numerous tasks including rhyming, phoneme segmentation, initial/final sound detection, and blending. These have been labeled inside-out skills and the type of intervention is referred to as an explicit method of instruction. Schuele and Boudreau (2008) reviewed phonological research and found that intervening with preschool and kindergarten age children results in greater gains than intervention with early elementary students. Their review also found evidence that systematic, appropriate phonological intervention with preschool children leads to the

emergence of phonological skills of low complexity.   They defined these lower complexity skills as rhyming, alliteration, and syllable segmentation which are essential to developing emergent literacy. The studies represented in this review demonstrate how explicit literacy interventions can vary widely in the specific tasks taught and the skills assessed. Although some evidence of growth is evident across diverse instructional methods, the variability of results suggest the need for more research in this domain (Byrne & Fielding-Barnsley, 1991, 1995; Nancollis, Lawrie, & Dodd, 2005; Torgesen, et al., 1999).

The purpose of this study is to further analyze the effectiveness of both embedded and explicit early literacy interventions as well as a combination of the two and to compare the three treatment conditions with a control group. The necessity of this study lies in its potential benefit to preschool educators operating with limited time and personnel constraints in the classroom. Demonstrating the effectiveness of any of the three interventions is important to establish that a short-term, small group literacy intervention can be beneficial for students requiring extra instruction in early literacy. It is hypothesized that all three intervention conditions will demonstrate an increase in skill level as compared to the control but the combination intervention will be most effective across all measures. This study will extend the current research by examining the effects of short-term early literacy interventions when combined with small group instruction. The addition of progress monitoring throughout the conditions will further enhance the previous research investigating early literacy interventions. It will also supplement the current literature examining embedded and explicit early literacy as well as enhance the small number of studies that examine a combination of early literacy intervention with preschoolers.

Does focused instruction regarding phonological awareness or storybook reading lead to faster acquisition of early literacy skills or will a more balanced multi-component instructional

approach be most effective? Will the increase in early literacy skills be significantly higher in the

experimental conditions when compared to the control? How much of a change can be

accomplished in a short-term intervention? Will this proposed change be visible between each

progress monitoring session and could it be helpful to accumulate more data than simply pre and

post test scores?

Methods

Participants and Setting

Children who were 4 or 5 years old participated in the study. The children were enrolled in a preschool serving a middle-to-upper-class population in an urban area of Texas. A permission form was sent home to the parents of each child identified for intervention. The form detailed the study and asked for informed consent from the child's parent. Permission was given for 43 children to participate in the study. Six children were excluded from the final data set based on absence from class totaling more than five intervention sessions or one testing session. Testing sessions were conducted individually and took place in a corner of the preschool classroom. All intervention sessions were conducted in groups of four to six children and occurred in a corner of the classroom designated the reading center.

In order to create groups equal in early literacy skill level, participants were block assigned to conditions (Drew, Hardman, & Hosp, 2007). Randomized block assignment was accomplished by dividing the children into three categories (high, middle, and low) depending on their scores from the first assessment. Next the children were alternately assigned to one of four groups so that each group contained an equivalent number of children from each scoring level. The groups were then randomly assigned to a condition. The children participating in the three treatment conditions experienced 15 – 20 intervention sessions, dependent on their attendance.

After attrition, the dialogic reading groups consisted of 10 children, 5 females and 5 males. The phonological awareness training groups also included 10 children, with equal distribution between males and females. The dialogic/phonologic combined groups consisted of 9 children including 5 females and 4 males. The control groups suffered the most attrition and finished with 8 children, 2 females and 6 males. The demographic characteristics of the final study population

showed that approximately 58% of participants were Caucasian, 27% were African American, 9% were Hispanic, and 6% were Asian.

Data Collection and Dependent Variables

The dependent variables were tasks measuring early literacy skills. Dynamic Indicators of Basic Skills (DIBELS) were used to assess each child's fluency in letter naming, initial sound, and word use (Good & Kaminski, 2003; Kaminski & Good, 1996). These measures were created to increase the use of curriculum based measures and regular progress monitoring for early literacy skills. Letter naming and initial sound measures were used to assess the child's level of phonemic awareness. Expressive language skills were assessed with the word use task.

In the letter naming assessment, the children were presented with a sheet of randomized uppercase and lowercase letters and asked to name as many letters as possible in a one minute time period. The timer was started once the child was told to begin and stopped after one minute had elapsed. If a child hesitated for three seconds, the letter was scored incorrect and they were prompted to move on to the next letter. Letters were counted as incorrect if they were omitted or an incorrect response was given. The total number of letters correct within one minute was recorded as the score. Research evaluating this assessment instrument has shown it to offer high convergent and discriminant validity in relation to overall reading ability, high alternate-form reliability, as well as high predictive validity for reading scores at end of first grade (Elliot, Lee, & Tollefson, 2001; Good, Kaminski, Simmons, & Kame'enui, 2001; Rouse & Fantuzzo, 2006).

During the initial sound measure, participants were presented with a page of four pictures and given the correct name for each picture as the experimenter pointed to the specific picture. The experimenter then followed a script for the assessment questions. The first three questions for each picture page asked the child to identify the picture that began with a specific sound. The fourth

question asked the child to orally produce the beginning sound of one picture. The child's response was timed for each question. If the response period lasted longer than five seconds for a question, the timer was stopped, the question was marked incorrect, and the examiner moved on to the next question. Correct answers were given one point and incorrect answers were given zero points. To determine the total score, the total number correct was multiplied by 60 and divided by the number of seconds required. This calculation results in a one minute fluency score, analogous to the scores derived from the letter naming and word use fluency measures. The initial sounds fluency measure has been shown to possess high alternate-form reliability and average to high concurrent and predictive validity (Kaminski & Good, 1996, 1998; Laimon, 1994).

The last assessment component was word use fluency and it is intended to measure oral expressive language. The word use measure did not present any written material to the child. The examiner presented a word orally to the child and asked the child to use the word in a sentence. The timer was started after the first word was presented and words continued to be presented until one minute had elapsed. If the student paused for at least five seconds, the examiner provided the next word. The examiner counted the total number of words used in each utterance as long as the words did not repeat and they were correctly related to the presented word. The final score consisted of the total number of words spoken in a one minute period. Results from this measure are indicators of level of vocabulary and oral language. Preliminary reports have shown average levels of criterion-related validity and high levels of alternate form reliability (Kaminski, Good, Shinn, Smith, Laimon, Shinn, Bratten, 2004).

The participants were administered each of the three early literacy measures four times, once prior to the start of treatment, twice spaced evenly through the intervention, and finally following the treatment period.

Treatment Conditions

The independent variable in this study was the type of early literacy instruction delivered. Each instruction technique focused on early literacy skills but varied in the amount of explicit versus implicit teaching existing in each condition. Participants were assigned to groups and each group was randomly assigned to a treatment condition.

Control. The control condition was utilized to compare the effects exhibited in each of the three intervention conditions. During the control condition, the students were tested at the same intervals as all other participants but experienced no treatment other than the normal classroom instruction.

Dialogic Reading. In this condition, students received 20 minutes of dialogic storybook reading as described by Zevenbergen & Whitehurst (2003). This intervention included modeling language, content questions, eliciting descriptions and feedback from a preschool story book. The experimenter read aloud to a small group of children and elicited responses from the children by asking open-ended questions, fill-in-the-blank questions, and recall prompts. As the children responded to the story, the experimenter praised correct answers, made corrections, expanded upon the children's responses, and encouraged further participation. In order to ensure that each child received equivalent time and involvement in the reading experience, the experimenter asked each child two to three inquiries then moved on to the next student. The students continued to take turns until the story was completed or the time period had elapsed. A detailed procedural description of the dialogic reading intervention is provided in Appendix A.

Phonological Awareness. The children received 20 minutes of explicit instruction in phonological awareness skills including letter names and sounds, phoneme rhyming, and phoneme segmentation. In one exercise, the experimenter showed the children cards with pictures on them

and asked a child to identify the picture. They were then asked to identify the initial letter and initial sound of that picture. In the second task, the experimenter presented cards with one picture at the top and three other pictures beneath it. The children were asked to identify each picture then identify the picture that rhymed with the top picture. Next, the children generated other words that rhymed with the top picture on the card. The third task introduced similar cards with a top picture and three pictures beneath it. In this task, the children were asked to identify the pictures then find the picture that begins with the same initial sound as the top picture. The tasks were presented in a random order each day. The experimenter presented as many trials as time allowed before moving on to the next task and 6-7 minutes were allotted for each task. The experimenter offered praise for correct answers as well as corrections and encouragement for incorrect answers. The children readily took turns answering the requests of the experimenter. Appendix B offers a detailed description of each step in the phonological awareness procedure.

      Combined Procedure. In this condition, each group received 10 minutes of dialogic reading instruction and 10 minutes of phonological awareness instruction. In the dialogic reading portion, instruction was completed after 10 minutes even when the book has not been finished. Unfinished stories were completed during the next session. During the phonological awareness portion, instruction was completed in the same way as in the phonological awareness condition except that each task was given 3-4 minutes. Random assignment was used to decide which type of intervention was presented first in each combination session. Refer to Appendix C for a detailed description of the procedures utilized in the combined condition.

Treatment Integrity and Interobserver Agreement

      Data on inter-observer agreement (IOA) was collected for treatment and assessment sessions. An independent observer was trained in scoring the three assessments used in the testing

battery and scored the testing instruments simultaneously with the researcher during 29% of testing sessions. The observer was also given the treatment protocol checklist and followed the treatment script throughout 32% of treatment sessions. The IOA was determined for each treatment and assessment session by dividing the number of agreements by the number of disagreements plus agreements and multiplying by 100%. The mean IOA for testing sessions was 86% (range, 52% to 94%) and for treatment sessions was 95% (range, 82% to 100%).

Results

Three outcome measures were targeted in this study: letter naming fluency, initial sound fluency, and word use fluency. A repeated measures multivariate analysis of variance (MANOVA) was utilized to examine the effects of time, condition, and their interaction on early literacy assessment scores. The within subjects factor, time, is represented by the four different assessment sessions. The between subject factor, treatment condition, consisted of dialogic training, phonological training, combined dialogic and phonological, and control. The raw scores from the four assessment sessions served as the dependent variables.

The MANOVA, represented in Table 1, shows a significant main effect of time, Wilks' Lambda = .22, $F(3,33)=9.78$, $p<.001$, multivariate eta squared = .78. A significant effect was also obtained in the interaction between time and condition, Wilks' Lambda = .21, $F(3,33)=1.95$, $p=.013$, multivariate eta squared = .41. Results found no significant difference at the $p \leq .05$ level across the conditions, however the time by condition interaction is interesting.

Table 1
Repeated Measures Multivariate Analysis of Variance for Time, Condition, and Interaction between Time and Condition

Variables	*df*	*F*	η^2	*p*
Time	(3,33)	9.777	.779	<.001
Condition	(3,33)	.682	.061	.723
Time*Condition	(3,33)	1.948	.408	.013

Effectiveness Across Time

Results indicate that the children made substantial gains across the four weeks of the study. Univariate tests for the main effect of time confirmed growth across all three measures (Table 2 and Table 3).

Letter Naming. Letter naming fluency showed an overall increase over time ($F(3,33) = 11.30, p < .001$). Post hoc comparisons were completed to examine the assessment sessions within each measure. Significant differences were identified based on the Bonferroni test with a .05 limit on familywise error rate. Table 3 shows the changes in means across sessions and based on the post hoc comparisons, there was a significant difference between the first assessment session and the third and fourth sessions. A significant difference was also found between the third and fourth assessment sessions.

Initial Sound. Initial sound fluency also showed an overall increase across time ($F(3,33) = 14.52, p < .001$). Session means are represented in table 4. For this measure, the post hoc pairwise comparison indicated the scores from the first assessment session were significantly different from the second, third, and fourth assessment sessions.

Word Use. Word use fluency illustrated a general increase across time ($F(3,33) = 12.83, p < .001$) and these increases are seen through the sessions means represented in table 5. The post hoc pairwise comparison showed significant differences between the first and fourth assessment sessions as well as between the third and fourth assessment sessions.

Effectiveness across Conditions

At the $p \leq .05$ level, no significant difference was found across the treatment conditions. A significant difference was evident in the time by condition interaction. Based on the simple examination of means, the students' scores increased across all three measures and all four conditions. Visual inspection of cell means is available in figures 1, 3, and 5. Simple inspection of the means does not accurately illustrate interactions. The interactions can be accurately examined by calculating the decomposed cell means across the testing sessions and conditions. This

Table 2

Analysis of Variance for Initial Sound, Letter Name, and Word Use Fluencies

Measure	df	F	η^2	p
Letter Name				
Time	(3,33)	11.303	.522	<.001
Time*Condition	(3,33)	3.289	.235	.002
Initial Sound				
Time	(3,33)	14.516	.584	<.001
Time*Condition	(3,33)	1.653	.136	.116
Word Use				
Time	(3,33)	12.834	.554	<.001
Time*Condition	(3,33)	1.395	.117	.205

Table 3

Descriptive Statistics across Testing Sessions by Measure and Treatment Condition: Letter Naming Measure

	Letter Name							
	Session 1		Session 2		Session 3		Session 4	
Condition	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dialogic	21.40	9.03	21.20	13.28	21.10	10.24	21.70	12.46
PA	20.20	8.28	20.30	9.58	18.00	11.44	25.10	10.19
Combination	17.44	11.78	27.33	11.85	29.67	12.49	31.78	13.73
Control	23.00	14.62	27.63	16.90	27.25	15.12	31.88	15.75

Table 4

Descriptive Statistics across Testing Sessions by Measure and Treatment Condition: Initial Sound Measure

	Initial Sound							
	Session 1		Session 2		Session 3		Session 4	
Condition	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dialogic	6.90	4.33	12.90	3.93	13.50	7.93	16.60	10.49
PA	8.50	5.40	13.20	12.03	9.20	4.54	10.60	9.29
Combination	9.00	5.70	11.00	8.03	14.33	9.59	16.00	13.21
Control	9.13	7.34	17.25	5.01	18.75	5.29	18.75	4.77

Table 5

Descriptive Statistics across Testing Sessions by Measure and Treatment Condition: Word Use Measure

| | Word Use | | | | | | | |
| | Session 1 | | Session 2 | | Session 3 | | Session 4 | |
Condition	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dialogic	24.20	16.71	22.30	14.61	26.20	16.78	32.70	14.81
PA	10.40	7.15	19.30	18.12	19.10	11.18	29.30	20.01
Combination	21.11	12.81	26.78	16.32	19.44	13.88	31.44	15.92
Control	22.63	6.44	22.88	5.94	29.63	16.07	33.13	9.03

calculation generates cell means corrected for main effects and is described in depth by Rosnow and Rosenthal (1989).

An analysis of variance (ANOVA) of the separate assessments (Table 2) found a significant difference for the letter naming measure in the interaction of time and condition ($F(3,33) = 3.29$, $p < .005$). Visual inspection of the decomposed cell means in figure 2 shows the largest increase observed for the letter naming measure in the combined dialogic/phonological condition. The ANOVA (Table 2) found no significant difference in the time by condition interaction for the initial sound measure. The decomposed cell means of the initial sound fluency measure (Figure 4) indicate varied results but the dialogic reading condition provides the most stable and increasing scores as compared to the other conditions. Figure 6 presents a visual representation of the word use fluency scores across conditions. This measure produced the most variable results across conditions as compared to the other two assessment measures. Based on visual interpretation, the phonological awareness condition offered the best results in stability and score increase. However, no significant difference was found in the interaction between time and condition for the word use measures (Table 2).
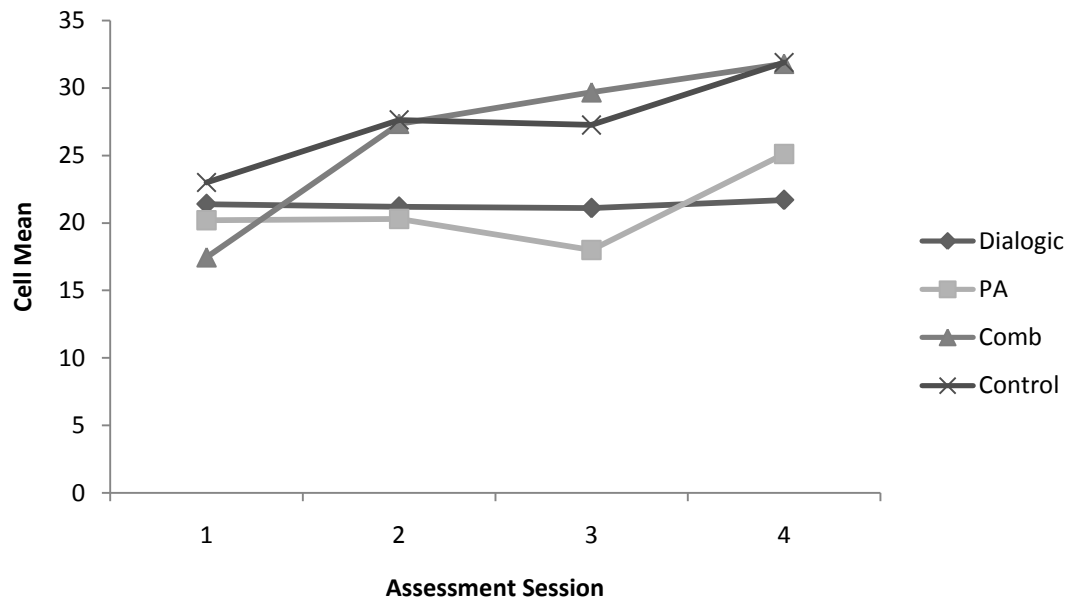
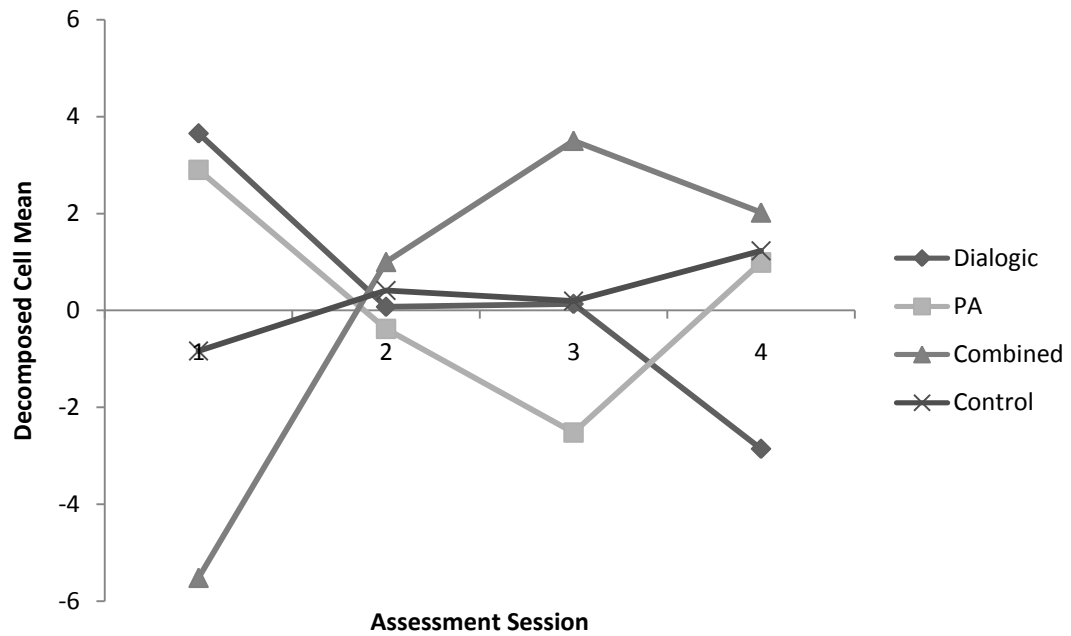**Figure 1:** Letter Naming Measure – Simple Cell Means

Figure 2: Letter Naming Measure – Decomposed Cell Means
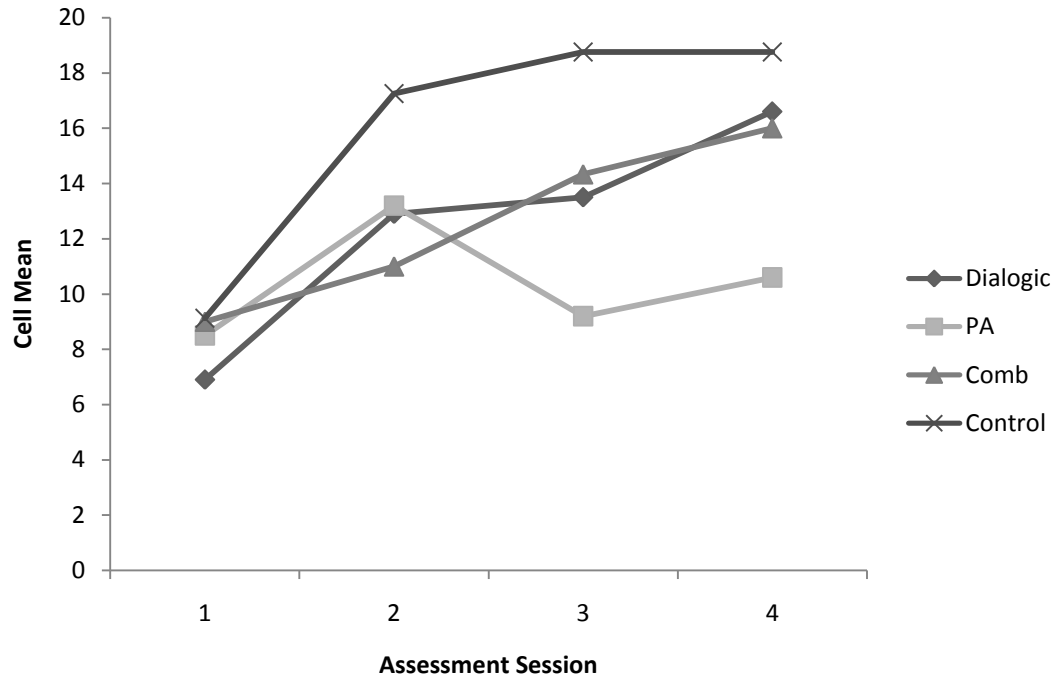
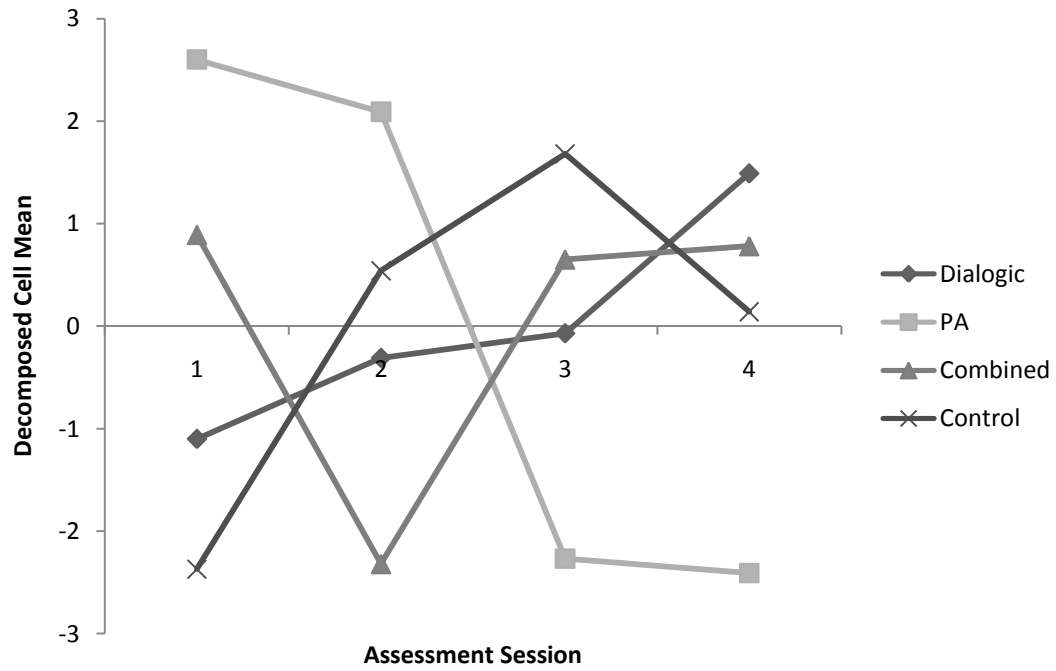**Figure 3:** Initial Sound Measure – Simple Cell Means

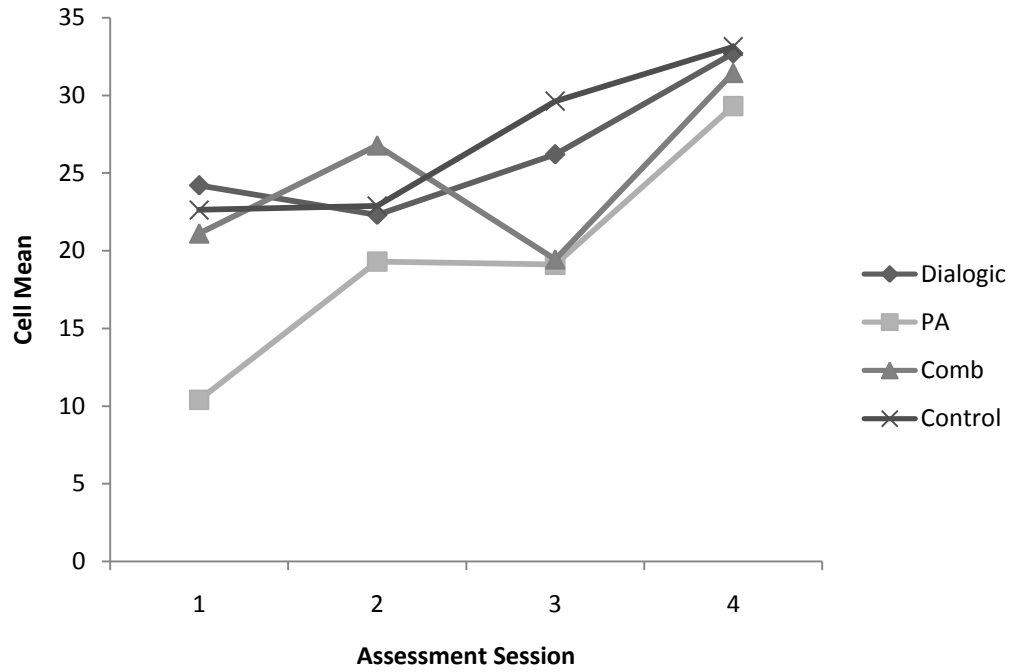**Figure 4:** Initial Sound Measure – Decomposed Cell Means

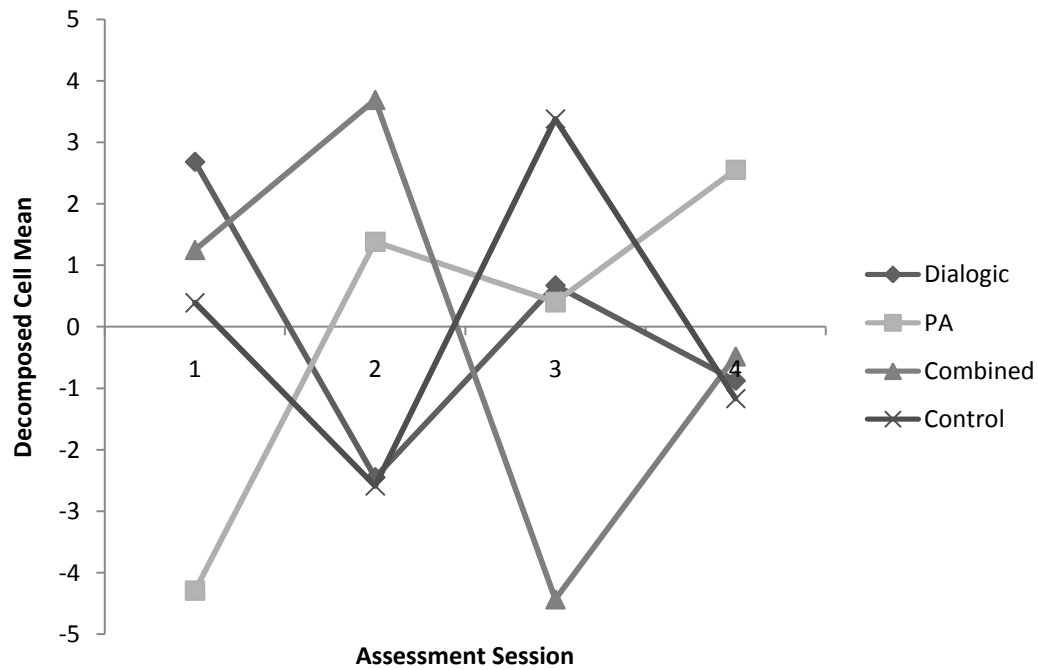**Figure 5:** Word Use Measure – Simple Cell Means

Figure 6: Word Use Measure – Decomposed Cell Means

Discussion

Early literacy skills, such as phonemic ability and print awareness, are the building blocks for future reading competence and success in further areas of academics. Researchers have agreed that it is important for children to develop a strong base of these skills at an early age (Bowey, 1994; Burgess & Lonigan, 1998; Wagner, Torgesen, & Rashotte, 1994). The National Reading Panel (2000) has argued that phonological awareness, alphabetic knowledge, and print awareness are the central skills needed to achieve this solid base from which to build further reading skills. So far, the emerging research has not reached a consensus as to what type of teaching strategy or strategies provide the best acquisition of early literacy skills (Cabell, et al., 2008; Justice & Kaderavek, 2004). The current research is also deficient in utilizing effective progress monitoring techniques with preschool children (Bryan et al., 2008). This study attempted to enhance the current research by examining the effects of three different early literacy instructional methods as well as a control condition. Preschool children were involved in one of four conditions: dialogic reading, phonological awareness, dialogic/phonological combined, or control. In addition to exploring the different conditions, this study also investigated the effects of time on early literacy skill acquisition. The children were assessed four times in total, falling at regular intervals, throughout the intervention. The three tests included in each assessment session were initial sound fluency, letter naming fluency, and word use fluency. The following will discuss the results found in this study, the implications of these results, possibilities for future research, and the limitations existing in this study.

The results of the current study showed no significant main effect for condition between the three treatment conditions and the control condition. The interaction between time and conditions was significant for the initial MANOVA but when more closely examined, the letter naming

measure was the only measure to indicate a significant interaction. Based on the decomposed cell means, the combined dialogic/phonological condition exhibited the greatest increase in score in the letter naming measure. These findings support previous studies which promote using a combined reading and phonemic skills approach in order to increase basic emergent literacy skills (Hatcher, Hulme, and Ellis, 1994; Whitehurst, Epstein, Angell, Payne, Crone, & Fischel, 1994; Whitehurst, Zevenbergen, Crone, Schultz, Velting, & Fischel, 1999).

The initial sound measure appeared to show the largest increases with the dialogic condition, although there was no significant interaction effect. Without a significant finding, no determination can be made as to whether dialogic reading could be an effective intervention for increasing phonological awareness skills such as initial sound fluency. Past research has assumed the greatest increase in phonemic skill would derive from an intervention centered on phonological awareness but this assumption has been challenged by other research findings (Hatcher, Hulme, & Ellis,1994; Justice & Kaderavek, 2004). This result promotes further exploration in to the use of storybook reading interventions for increasing emergent literacy skills beyond print awareness.

When examined using decomposed cell means, word use fluency exhibited the greatest variability in scores across conditions. An examination of the simple cell means revealed the phonological awareness treatment condition to have the largest score increase but further analysis showed no significant difference in the time by condition interaction. Previous research has differed in the assumption of a correlation between storybook reading and language growth (Bus, van Ijzendoorn, & Pellegrini, 1995; Scarborough & Dobrich, 1994). Similar to the results from the initial sound measure, the link between word use and phonological awareness could be an interesting finding but requires further investigation in order to substantiate that possibility.

The findings from the interaction between time and condition were not the initial focus of the research hypothesis. Taken together, the decomposed cell means from the three assessment measures suggest the use of different types of emergent literacy intervention in increasing various early literacy skills (National Reading Panel, 2000). This suggests that early literacy skills may be strengthened by interventions that do not directly target a narrow, specific skill (Burns, 2003; Camilli, et al., 2003). If this result were supported in a wider range of studies and with larger samples, it may encourage the possibility for teachers to enhance a variety of skills with diverse early literacy interventions and to choose the ones that fit best into their classroom. One possible disadvantage includes the difficulty in choosing an intervention with the purpose of efficiently improving a specific, identified skill deficit. These findings are in need of future investigation to clarify the relationships exhibited in this study.

The main effect of time in the current study showed a significant difference between the four assessment sessions for the early literacy measures. A notable finding across testing sessions was that all assessments showed a significant increase in scores from the first testing session to the last testing session. This could indicate that the time period utilized in the study was appropriate for a detectable change in early literacy skills to have occurred. In other words, although this was a short-term intervention, the time period was long enough to produce significant increases in scores across all early literacy measures. These results do not indicate whether a longer intervention would have been more effective but the study does establish a basis for a minimum treatment time.

An extraneous variable that occurred during the collection of data was a category 2 hurricane which made landfall less than sixty miles from the region used in this study. The eye of the hurricane traveled directly over the neighborhoods that encompassed the children participating in the study. The preschool who participated in this study, along with the area schools, were closed

for more than a week and suffered some external damage. This storm caused a delay in treatment that occurred between the second and third testing sessions. This could account for the lack of significant progress noted on all assessment instruments from the second assessment session to the third. With the limited information available on the effects of hurricanes on young children, no causal relationship can be drawn between the storm and the performance of the preschoolers in the study. Future research is needed to explore the effects of natural disasters on children this age, especially the immediate academic and behavioral effects. The testing outcomes could have been affected simply by the delay in treatment occurring in the middle of the intervention package. This treatment interruption factor should also be examined in further studies.

Child behavior and interest often plays a role in the effectiveness of early literacy intervention programs (Kaderavek & Sulzby, 1998a; Snow, et al., 1998). Justice and colleagues (2003) found literacy interest to be very important to emergent literacy development and asserted that "children's engagement and interest in literacy activities seems critical to successful literacy achievement, even in the earliest stages of development." Although no data were collected to examine this variable, the investigator observed that the combination condition was most effective at keeping the attention of the children during the intervention sessions, with the dialogic condition as a close second. Toward the last two weeks of the treatment, the preschoolers in this study found it difficult to attend to the entire 20 minute session of phonological awareness regardless of the task or alternation of tasks. The children assigned to groups that included storybook reading were more enthusiastic and engaged throughout the sessions than the phonological awareness groups, which lead to better behavior during treatment sessions. Future research should examine, in a more quantitative manner, the relationship between child preference of literacy interventions, child

behavior during treatment sessions, and the treatment outcomes in preschool children (Lonigan, 2006).

This study differs from similar early literacy studies in that it compares these four interventions on a short-term time schedule with continued monitoring throughout the treatment. Typically, similar studies examine a pre-test score and a post-test score for changes based on the treatment intervention (Lonigan et al., 2000; Storch & Whitehurst, 2002). In this study, the participants experienced regular progress monitoring across the conditions. This type of progress monitoring could allow a researcher or teacher to examine the scores throughout an intervention and determine the best length of treatment (Bryan, et al., 2008). The outcomes from this study indicated that the best results occurred after the entire four week intervention. One interesting finding was the significance of the score increase between the first and second testing sessions for the initial sound fluency measure. This could indicate that for some assessment measures, only one week is necessary for determining whether the intervention is appropriate for the child. It may also represent a simple practice effect or practice effect combined with a novelty effect. Of course further research is essential in making this determination.

Limitations of this study include lack of follow-up testing, non-representative population of children, the uncontrolled nature of the control group, the small n size per group, and a limited assessment battery. One disadvantage to the study was the omission of follow-up assessment data. The addition of follow-up assessments could have been beneficial in further parceling out the results across the treatment conditions and promoting generalization across time. It would be advantageous to have some knowledge of the long-term effects from a short-term intervention with preschool children.

This investigation included 37 preschool children, 4 to 5 years old, from middle to upper class homes. The demographic characteristics of the participants showed that approximately 58% of participants were Caucasian, 27% were African American, 9% were Latino, and 6% were Asian American. Most of the children in this study came from families with higher than average levels of education (96% had some college) and income. The groups in the study were not significantly different from each other but the overall sample is dissimilar from the general population. This higher SES population lessens the possibility of generalization to other groups and threatens the external validity of the study.

A third limitation involves the good quality academic program already in place at the participating preschool. The data from the control group suggests that the students were receiving an effective early literacy education in their regular classrooms, which translates to a control group lacking in complete experimental control. This study was forced to examine the effects of the three treatment conditions in addition to the already effective program. These circumstances are similar to those of Whitehurst and colleagues (1994) whose study combined a dialogic reading treatment with an already effective letter and sound awareness curriculum. It is likely that when compared to a true no-treatment control, in a classroom with ineffective literacy practices, a difference would be observed between the three treatment conditions and the control.

The small number of participants in each condition could be considered a limitation of the study. A large attrition accounted for the loss of 14% of the original participants which produced a smaller sample size than originally anticipated. This small n could have lead to the lack of significant findings regarding the hypothesized results. A future study should examine these conditions with a larger group of children.

Another limitation of this study was the abbreviated testing battery used in the assessment sessions. A larger group of tests, assessing a more encompassing group of early literacy skills, could have led to better differentiation between treatment groups. The group of assessments utilized in each testing session was chosen based on the capabilities of the children, the appropriateness of the measure, and the option of different forms to accommodate numerous testing sessions. In order to meet these requirements, the testing battery included only three assessments and a limited scope of skills were measured.

Although the testing battery could be considered a limitation of the study, the shortened assessment battery utilized in the study provided an example of how successful regular progress monitoring can be with preschool students (Bryan, Ergul, & Burstein, 2008). One hypothesis for the scores in the control group being similar to the other conditions is the addition of weekly testing to their normal routine, which in itself could have aided in the acquisition of the skills being assessed (VanDerHeyden, Snyder, Broussard, & Ramsdell, 2008). Normally these children were tested only twice during the school year to examine their skills. The weekly progress monitoring proved to be an easily implemented addition to the classrooms, although the testing battery became time consuming with so many students and would be more easily carried out on a less frequent basis.

The results from the present investigation suggest future research to examine these treatment conditions for a longer period and include follow-up data in order to examine whether one proves to be superior in increasing early literacy skills. It could also be beneficial to examine these research questions on an individual basis. It is possible that the appropriate intervention will differ according to individual student skills and that this phenomenon will not be observed within a large sample study. Based on the data from the current study, it is hypothesized that no specific treatment

condition will consistently lead to better outcomes but that the act of increasing general early literacy instruction will likely increase numerous early literacy skills.

Results suggest that monitoring progress through weekly assessment batteries could be helpful for generating hypotheses after one week and four weeks of treatment. This realm of research is still in early phases so further study is important to confirm the effects with the preschool age group and with these specific early literacy interventions (Bryan, et al., 2008; VanDerHeyden, et al., 2008). The ability to evaluate the success and suitability of an intervention or instructional method as early as possible can lead to time saving opportunities for teachers and auxiliary personnel. Future research is warranted to confirm the outcomes observed in this study.

The possible benefits for identifying an effective early literacy intervention are extensive but remain out of reach until more research can offer a better grasp on what techniques are most effective. The observations made in this study suggest that several early literacy interventions exist but the current research is simply lacking the correct parameters for its determination. Once a method is identified for assigning the most suitable intervention to each student, it can be applied to individual interventions for children with specific academic difficulties, to the creation of small groups with similar strengths, or to whole class instruction. An essential component of this future research is combining increased outcomes with lower time consumption. This study offered evidence to support significant changes in early literacy skills over a short period of time as well as underscoring the benefits of regular progress monitoring with preschool age students. In conclusion, it is likely that interventions utilizing phonological awareness training and/or dialogic reading will promote increases in early literacy skills and consistent progress monitoring of skills can be beneficial in evaluating the success of such treatments.

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Appendix A

Parent Permission Form

Dear Parents,

We are writing to request your permission to work with your child in a research project. Our goal is to help increase your child's early literacy skills in order to increase his/her future school success. This opportunity is being offered to all pre-K children enrolled at the Primrose School at Fall Creek.

If you agree, your child's participation in this study will entail a master's level graduate student assessing his/her basic literacy skills and your child will participate in a small group intervention designed to increase early literacy skills. The weekly assessments will take place within the classroom individually between your child and the consultant. These assessment measures will examine numerous basic literacy skills and the results will be made available to you following study completion.

The intervention will be implemented in small group format and take place daily within the classroom. Your child will be randomly assigned to one of four different intervention conditions designed to increase their early literacy skills. One condition will be a control condition which will not involve any instruction, only the assessments. The study will be a total of four weeks.

If you choose to allow us to work with your child, both you and the school will receive a report of your child's assessment results. Your child's results may also be included in a research report on methods of increasing early literacy skills in preschoolers. If your child's results are included in any research reports, his or her name will not be included in the report. There are no known risks associated with this study. You may choose to withdraw your child from the study at any time or you may choose for your child to not participate in the project if you prefer.

If you have any questions, please feel free to contact us at your earliest convenience.

Sincerely,

Jenny Longwell, M.A., BCBA   Andrea Schoel   George Noell, PhD
Primary Researcher   Owner   Professor - LSU
Jennylongwell2@aol.com   Primrose School at Fall Creek   Supervisor
(512) 739-9334   (281) 459-2023   (225) 578-4119

Please keep this portion for your records.

Please check one and return this portion to school.

____   Yes, I give my permission for my child to participate in this project.

____   No, I prefer that my child not participate in this project.

Print Student's Name: _____

Print Parent's Name: _____

Parent's Signature: _____

If you have any additional questions about participants' rights or other concerns regarding the research component of this activity you can contact: Robert C. Matthews, Institutional Review Board, Louisiana State University, (225)578-8692.

Appendix B

Dialogic Reading Intervention

- Children sit in a group in the reading center with the researcher.
- The researcher introduces the book for the day or reintroduces the unfinished book from the previous intervention session by reading the title and showing the cover to the children. For books being continued from a previous session, the researcher and children discuss the story to that point before beginning the reading.
- The researcher reads a page of the book orally to the children while visually presenting the page to the children and following the words with a finger as they are being read.
- The researcher poses a question to one child about the page read. After the child answers the question, the researcher makes comments, corrections, or offers praise for the response. The researcher poses another question and again praises or comments on the child's response.
- If the page includes a great deal of information, the researcher may continue the question procedure with another child.
- Questions posed during storybook reading include open-ended questions, fill-in-the-blank questions, and knowledge recall prompts. Examples include: Why did the monkey go to the hospital?, The lady loves to eat _____?, What sound does a ladder start with?, What do you think the dog will do on his trip?
- The reading and questioning process continues with each page until 20 minutes has elapsed.

Appendix C

Phonological Awareness Intervention

- Children sit in a group in the reading center with the researcher.
- The researcher introduces the initial letter/initial sound task and gives instructions for this task. The children are asked to identify a picture then give the initial letter and initial sound for that picture.
- The children are each given one picture to name and identify the initial letter and sound before the next child is given a turn.
- This task continues for 6-7 minutes.
- The researcher introduces the rhyming task and gives the instructions for this task. The children are shown a card with four pictures, one at the top and three in a horizontal line below. A child is given the opportunity to name each picture and identify which of the three lower pictures rhymes with the top picture.
- If the child is unable to identify the rhyme, the researcher prompts the child by helping to repeat the picture names. If necessary, the researcher asks questions regarding the pictures until a rhyme is identified. Example: Do lake and boat rhyme? Do lake and cake rhyme?
- The child is also given the opportunity to generate more words that rhyme with the target picture.
- Once a card is completed, the researcher moves on to the next card and another child is given the opportunity to participate.
- This task continues for 6-7 minutes.
- The researcher introduces the initial sound task and gives the instructions for this task. The children are shown a card with four pictures, one at the top and three in a horizontal line below. A child is given the opportunity to name each picture and identify which of the three lower pictures has the same initial sound as the top picture.
- If the child is unable to identify the picture with the same initial sound as the target picture, the researcher prompts the child by aiding them in identifying the initial sound of each picture. If necessary, the researcher asks a question regarding each picture until a match is identified. Example: What sound does man start with?
- The child is also given the opportunity to generate more words that begin the same initial sound as the target picture.
- Once a card is completed, the researcher moves on to the next card and another child is given the opportunity to participate.
- This task continues for 6-7 minutes.
- The three tasks are each completed within the 20 minutes time period.
- The three tasks are randomly presented each day and may not occur in this order.

Appendix D

Dialogic Reading/Phonological Awareness Combined Intervention

☐ Children sit in a group in the reading center with the researcher.

☐ The researcher introduces the book for the day or reintroduces the unfinished book from the previous intervention session by reading the title and showing the cover to the children. For books being continued from a previous session, the researcher and children discuss the story to that point before beginning the reading.

☐ The researcher reads a page of the book orally to the children while visually presenting the page to the children and following the words with a finger as they are being read.

☐ The researcher poses a question to one child about the page read. As the child answers the question, the researcher makes comments, corrections, or offers praise for the response. The researcher poses another question and again praises or comments on the child's response.

☐ If the page includes a great deal of information, the researcher may continue the question procedure with another child.

☐ Questions posed during storybook reading include open-ended questions, fill-in-the-blank questions, and knowledge recall prompts. Examples include: Why did the monkey go to the hospital?, The lady loves to eat _____?, What sound does a ladder start with?, What do you think the dog will do on his trip?

☐ The reading and questioning process continues with each page until 10 minutes has elapsed.

☐ Next, the researcher introduces the initial letter/initial sound task and gives instructions for this task. The children are asked to identify a picture then give the initial letter and initial sound for that picture.

☐ The children are each given one picture to name and identify the initial letter and sound before the next child is given a turn.

☐ This task continues for 3-4 minutes.

☐ The researcher introduces the rhyming task and gives the instructions for this task. The children are shown a card with four pictures, one at the top and three in a horizontal line below. A child is given the opportunity to name each picture and identify which of the three lower pictures rhymes with the top picture.

☐ If the child is unable to identify the rhyme, the researcher prompts the child by helping to repeat the picture names. If necessary, the researcher asks questions regarding the pictures until a rhyme is identified. Example: Do lake and boat rhyme? Do lake and cake rhyme?

☐ The child is also given the opportunity to generate more words that rhyme with the target picture.

☐ Once a card is completed, the researcher moves on to the next card and another child is given the opportunity to participate.

☐ This task continues for 3-4 minutes.

☐ The researcher introduces the initial sound task and gives the instructions for this task. The children are shown a card with four pictures, one at the top and three in a horizontal line below. A child is given the opportunity to name each picture and identify which of the three lower pictures has the same initial sound as the top picture.

☐ If the child is unable to identify the picture with the same initial sound as the target picture, the researcher prompts the child by aiding them in identifying the initial sound of each picture. If necessary, the researcher asks a question regarding each picture until a match is identified. Example: What sound does man start with?

☐ The child is also given the opportunity to generate more words that begin the same initial sound as the target picture.

☐ Once a card is completed, the researcher moves on to the next card and another child is given the opportunity to participate.

☐ This task continues for 3-4 minutes.

☐ The three tasks are each completed within the 10 minutes time period.

☐ The three phonological awareness tasks are randomly presented each day and may not occur in this order. The order of the dialogic reading and phonological awareness procedures are also randomly presented each day.

Vita

Jennifer Koenig Longwell is currently a graduate student in the School Psychology Program at Louisiana State University under the direction of Dr. George Noell and Dr. Joseph Witt. She received both her Bachelor of Science degree (2000) and Master of Arts degree (2003) from Louisiana State University in the major area of psychology. Jennifer Longwell is a candidate for the degree of Doctor of Philosophy to be awarded in May 2009.