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Phonological Awareness Training in a Preschool Classroom
of Typically Developing Children

A thesis
presented to
The Faculty of the Department of Communicative Disorders
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Science in Communicative Disorders

by
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May 2003

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Keywords: Phonological Awareness

ABSTRACT

Phonological Awareness Training in a Preschool Classroom of Typically Developing Children

by

Sara Phelps

The purpose of the present study was to assess the effectiveness of phonological awareness (PA) training with typically developing preschool children in a classroom setting. The PA training incorporated a range of PA skills and the training outcomes were assessed along a broad spectrum of PA abilities, pre-literacy skills, and general language abilities.

This study consisted of 21 children (11 Experimental, 10 Control). The classroom PA training program was conducted with the Experimental class in one large group for 5 weeks with 20 minute sessions conducted three times a week. A variety of fun, play-based PA activities were used with the class that incorporated the spectrum of PA skills.

No main effects were observed for any of the test measures, with the exception of the Experimental group's statistically significant gains for total number of words, number of different words, and a negative effect on the Phonological Awareness Literacy-Pre-Kindergarten.

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DEDICATION

This thesis is dedicated to my family, who taught me with hard work and perseverance I could accomplish anything I set my mind to; and to Paul, whose encouragement and love kept me going.

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CHAPTER 1

REVIEW OF THE LITERATURE

Introduction

Early childhood is a critical period for literacy development (Neuman, Copple, & Bredekamp, 1999; Shonkoff, 2000; Shonkoff & Phillips, 2000). Emergent literacy skills are an important part of children's early language development and are influenced long before children start formal instruction (Adams, 1990; Burns, Griffin, & Snow, 1999; Hart & Risley, 1995). Children's development of language during the preschool years is strongly related to how well they will later learn to read (Burns et al.). Without a solid foundation of literacy knowledge and skill, children will have a great deal of difficulty benefiting from the literacy instruction provided by their first grade teacher (Schickedanz, 1999).

The importance of reading and early literacy was recently highlighted by Jacobson (1999) who determined that the difference between poor readers and normal readers became increasingly marked over time (years of school). Despite the experimental group's receiving remedial therapy for their reading disability, Jacobson found that they continued to fall behind the control group, therefore, supporting a deficit model rather than a lag model. This deficit can further contribute to a continuing downward spiral. Scarborough, Dobrich, and Hager (1991) reported that children of parents with poor reading skills became poor readers in school because they were exposed to less reading and book experiences, whereas children of parents with normal reading ability became better readers in school.

There is growing attention to the preschool educational curricula that our children are receiving. Most preschool curricula address the developmental domains, but research has shown

that programs that fail to provide language, cognitive, and early reading instruction/activities do not support school readiness. Therefore, the importance of preventing, rather than remediating, these academic difficulties appears to be the most effective and efficient way to manage this growing educational concern (US Department of Education, 2002).

Children who begin school behind in language, cognition, and early reading skills often do not “catch up”. They continue to lag behind their peers in these academic domains. Juel (1988) found that 87% of children who were poor readers at the end of the first grade remained poor readers at the end of the fourth grade. Ramey and Campbell (1991) found that reading failure can be reduced significantly with appropriate intervention in preschool, kindergarten, and first and second grades. There are many skills that must be acquired in order for children to become successful readers. These skills include oral language (expressive and receptive language, which includes vocabulary development), phonological awareness (rhyming, blending, segmenting sounds), awareness of the conventions of print, and alphabetic knowledge (letter recognition). Children who received instruction that focused on these reading development skills before entering kindergarten had higher reading and math scores, less grade retention, better social skills, fewer teen pregnancies, and less participation in welfare programs (Reynolds, 1997). The majority of reading difficulties of many adolescents and adults most likely could have been prevented or resolved during the early childhood years (US Department of Education, 2002).

An important aspect of pre-literacy skills is phonological awareness (PA). Scientifically based reading research (Adams & Bruck, 1995; Griffith & Olson, 1992; Lundberg, Frost, & Petersen, 1988; Maclean, Bryant, & Bradley, 1987; Yopp, 1992; Yopp & Yopp, 2000) has shown that teachers can facilitate PA skills through the use of linguistic awareness games such as songs, nursery rhymes, rhyming activities, and sound manipulation activities. PA and its link to literacy

as an early readiness skill will be addressed in this study. Specifically, this study will examine the incorporation of classroom PA activities in a preschool program by a speech language pathologist (SLP) on the development of children's preliteracy skills. The remainder of this chapter will focus on the link between PA skills, metalinguistic skills, and literacy development. The continuum of PA skills from the earliest developing skills to the PA skills needed for literacy development will also be addressed. This chapter will also describe the importance of incorporating PA training in classroom settings and its positive correlation with literacy development. Finally, the strengths and weaknesses of PA training in the classroom setting will be reviewed, highlighting gaps within the research.

Phonological Awareness

Definition of Phonological Awareness

Phonological awareness is the awareness that an individual has of the sounds in spoken words. It is the awareness that speech consists of a sequence of sounds, also known as phonemes (the smallest component of speech). Children who have acquired PA skills have the ability to notice, mentally grab hold of, and manipulate phonemes (Yopp & Yopp, 2000). PA skills include the ability to (1) identify and create rhyming words; (2) identify and create words through alliteration; (3) count syllables; (4) match words by initial or final sounds; (5) isolate a sound in a word; (6) delete a sound in a word; (7) blend individual sounds to form a word; (8) substitute sounds in a word; and (9) segment a word into its constituent sounds (Ball, 1997; Griffith & Olson, 1992; Major & Bernhardt, 1998; McBride-Chang, 1995; Roth & Baden, 2001; Yopp, 1992; Yopp & Yopp, 2000). Harbers, Paden, and Halle (1999) stated that a phonologically aware individual can be defined as having mastered the following components:

(1) awareness of phonological strings; (2) awareness of syllables; (3) awareness of phoneme segments; and (4) awareness of phonetic features. PA begins to develop during the preschool and early elementary years and, therefore, is a crucial component of formal and intentional instruction that needs to be addressed in order to prevent reading difficulties in children as they progress through their educational years.

Importance of Phonological Awareness

PA has been identified as one of the most important predictors of reading success that should be addressed in preschool and kindergarten. Juel (1988) found that 87% of first grade children who had difficulty with PA tasks such as blending, segmenting, and manipulating sounds remained in the bottom quarter of their class in reading four years later. According to Van Kleeck, Gilliam, and McFadden (1998), PA skills predict early reading abilities, PA training results in improved reading achievement, and children and adults who are poor readers or illiterate have less well-developed PA abilities. PA is extremely important to educators because of its strong and positive correlation with reading development.

Link between PA Skills, Metalinguistic Awareness, and Literacy

Similar to PA, metalinguistic awareness has a strong correlation with the development of early literacy skills (Chaney, 1992; Hesketh, Adams, & Nightingale, 2000; Menyuk & Chesnick, 1997). Metalinguistic awareness refers to an individual's awareness of and control over one's language in general. It allows one to reflect upon and manipulate the structural features of spoken language. It is a high-level linguistic skill that requires the ability to produce and comprehend language in a communicative way, to separate language structure from communicative intent, and to perform mental operations on the structural features of language.

Metalinguistic awareness includes a variety of linguistic skills that includes PA skills such as segmenting words into syllables and phonemes, as well as detecting lexical and structural ambiguities, separating words from their referents, and judging semantic and syntactic appropriateness (Chaney).

These metalinguistic skills have been divided into four broad categories: (1) phonological awareness; (2) word awareness; (3) syntactic awareness; and (4) pragmatic awareness (Chaney, 1992; Tunmer, Herriman, & Nesdale, 1988). Research (Chaney; Hesketh et al., 2000; Menyuk & Chesnick, 1997; Rivers & Lombardino, 1998) has clearly proven that metalinguistic awareness significantly contributes to the acquisition of reading. The metalinguistic ability that has received the most attention in reading development is PA. Many researchers (Chaney; Menyuk & Chesnick; Rivers & Lombardino; Tunmer et al.) say that PA is the most crucial component of metalinguistic awareness needed for children to develop early reading skills.

Development of PA Skills

PA is the skill that is most directly linked with literacy development in the preschool years and early elementary school years. According to Roth and Baden (2001), rhyming and alliteration are two early developing PA skills in typically developing children. Rhyming and alliteration represent the child's sensitivity to the understanding that speech is comprised of a sequence of individual units. Children who begin school with the ability to recognize and produce rhymes and alliteration are more likely to become successful readers than children who do not have this level of awareness (Ball, 1997). Phonological tasks at a moderate level of complexity require children to categorize or produce words according to their initial and final

sounds. Again, children who are able to recognize and master these tasks are more likely to become successful readers than children who do not have the ability to perform this level of PA tasks (Ball; Griffith & Olson, 1992).

The next level of awareness includes the ability to segment syllables into individual phonemes and is demonstrated by tapping out each phoneme in the syllable or by moving blocks (objects) that represent each phoneme. Children who understand that speech can be separated into smaller parts have the ability to benefit from sound-symbol and literacy instruction that can be applied to the alphabetic system. PA deepens as children increase their understanding and knowledge of the sound-symbol relationship. This deeper level of PA facilitates reading abilities (Ball, 1997; Griffith & Olson, 1992).

The highest level of PA includes the ability to explicitly, consciously, and analytically access and manipulate phonological representations of words through segmentation and the manipulation of phonemes to form different words (Ball, 1997; Griffith & Olson, 1992).

The different degrees of difficulty may lead some to believe that PA is achieved in very discrete, precise steps; when in actuality, children have different degrees of word and syllable awareness. According to Yopp (1992), PA skills do not develop in a lockstep process. A child does not need to have mastery on one skill before moving to the next. Instead, PA skills develop along a continuum. However, children can develop different levels of PA across this continuum. Regardless of the order in which children develop PA, the important fact remains that the development of PA skills is a fundamental and crucial part for reading readiness and beginning reading (Jenkins & Bowen, 1994).

Incorporation of PA Activities in Classroom Settings

PA Instruction

Educators of young children are beginning to look for guidance for instruction of PA as more and more research proves that PA has a significant impact on early reading development. Teachers have asked many questions with regard to how much time should be devoted to these activities, what type of instruction is appropriate, and how do you develop and implement this informal type of instruction (Yopp & Yopp, 2000).

According to Yopp and Yopp (2000), PA activities can be incorporated in the classroom in a variety of ways. PA programs should be conducted 2-3 days a week with 10-30 minute sessions over a period of 3 weeks to 2 years (Brady & Moats, 1998; Yopp & Yopp, 2000). Many experts believe that PA activities should be fun, play-based, and age/child appropriate. Adams and Bruck (1995) believe that songs, chants, and word-sound games are geared toward developing and heightening children's sensitivity to the sound structure of language. Beck and Juel (1995) view word play, nursery rhymes, and storybooks as an ideal way to increase PA. Yopp (1992) stated that PA training should be playful and engaging, interactive and social, and should stimulate curiosity and experimentation with language.

Instruction that incorporates PA in the classroom needs to be purposeful and deliberate. PA activities have true value when educators have a goal in mind. Therefore, PA structure should be intentional, not incidental. In addition to being purposeful, educators must view PA as one part of a much broader literacy program (Hatcher, Hulme, & Ellis, 1994; Kamhi, Allen, & Catts, 2001; US Department of Education, 2002; Yopp, 1992; Yopp & Yopp, 2000). PA training should not replace other types of formal literacy instruction that includes the development of vocabulary, syntax, comprehension, decoding strategies, strategic reading abilities, and writing.

PA is a precursor for the development of reading abilities, but it is also a result of children being exposed to literacy experiences (Yopp & Yopp, 2000).

Activities that Heighten PA

PA skills can be increased when activities focus on the following categories: (1) sound/syllable matching; (2) sound/syllable isolation; (3) sound/syllable blending; (4) sound/syllable addition or substitution; (4) sound/syllable segmentation; and (5) rhyming.

Activities that incorporate any of the previous PA skills should be fun, play-based, and child appropriate. The following are examples for each category adapted from Yopp and Yopp (2000) and Yopp (1992).

Sound/syllable matching. When presented with a list of words or objects, children are asked to decide which words begin with a certain sound or syllable. For example, the words *cat, mouse, kite, and play* are presented to the children. The children are then asked to identify which words start with the sound /k/. In another activity children can also be asked to generate a list of words that begin with the /k/ sound. This encourages children to become consciously aware of sounds in words.

Sound/syllable isolation. A single sound may be emphasized when children are asked to focus on a certain sound. The sound can occur in the initial, medial, or final position. For example, the words *sun and soup* are presented to the children. The children are then asked to tell what sound is in the initial position of these words. This again encourages children to consciously think about sounds in words.

Sound/syllable blending. Activities that involve blending require children to manipulate individual sounds/syllables to form words. For example, a word is presented in isolated sounds, such as c - a - t and then the children are asked to blend the sounds together to form the word “cat”. This teaches children that words are made up of a series of individual sounds.

Sound/syllable addition or substitution. Many activities for sound/syllable addition or substitution can be developed using familiar songs. Using songs that are familiar will encourage children to become consciously aware of the sounds in speech. For example, “The Name Game Song” is a good activity to practice sound substitution. “Let’s do Sara, Sara Sara Bo Bara, Banana Fanna Fo Fara, Fe Fi Mo Mara, Sara.”

Sound/syllable segmentation. Segmentation refers to the ability to isolate the sounds in a spoken word. Activities that include iteration (repetition) are excellent activities to use to encourage sound segmentation. For example, Sara can be said as S-S-S-Sara or Ssssssara. Children can also be asked to segment a word into each of its components. For example, the children are given the word “race” and they are asked to segment the sounds individually to form /r/-/e/-/s/. This task is a more challenging PA task that encourages children to become consciously aware of the sounds in speech.

Rhyming. Activities that focus on rhyme encourage children to become more phonologically aware of the sounds in a word. Rhyming activities can be developed from books or familiar songs. For example, the song “Down by the Bay” is a song that offers children the opportunity to create new lyrics. After the children learn a verse such as “Did you ever see a whale with a

polka dot tail?” they can create a verse such as “Did you ever see a shark strolling in the park?”

Studies on PA Training

Studies With Preschool Children

There are many studies that have been conducted that support PA training in young children. In the study by Byrne and Fielding-Barnsley (1991), the effects of PA training in 126 four-year old preschool children was examined. This study primarily focused on the recognition of phoneme identity across words. Pretest measures were obtained through standardized and nonstandardized tests. Verbal facility and book and print conversion measures were collected using standardized tests. Nonstandardized tests were used to obtain measures of knowledge of the 26 letters and their sound representations, rhyme recognition, and phoneme identity. The experimental group consisted of 64 preschoolers who were trained for 12 weeks on 9 phonemes. The control group consisted of 62 preschoolers who were not trained on PA. Posttest data were collected for phoneme identity, letter knowledge, and reading. Greater gains were made in PA by the experimental group when the pretest and posttest measures were compared. The gains included enhanced phoneme identification (for trained and untrained sounds) and word recognition.

Lundberg, Frost, and Peterson (1988), conducted a study to evaluate the effectiveness of PA training in preschool children. Two hundred fifty-three Danish preschool children received instruction on PA within their classes over an eight month period. The training focused on rhyming, segmentation, phoneme identification in initial position of words, and prosody. One hundred fifty-five preschool children served as the control group and were only given the pretest/posttest measure. The pretest/posttest measure was used to obtain nonstandardized

measures of the preschool children's pre-reading ability and PA skills. The authors concluded that the PA training positively affected metalinguistic skills. Statistically reliable effects were observed on rhyming, manipulation, and segmentation measures. The data from the study supported the notion that PA can be developed in preschool children before the development of reading ability. They also found that their training not only resulted in significant gains in the children's PA, but significant positive effects on the facilitation of reading and spelling up to a Grade 2 level.

A longitudinal study was conducted by Wood and Terrell (1998) to assess whether the development of PA occurs naturally or if it is a direct result of reading instruction. The study consisted of 30 preschool, preliterate children. A nonstandardized PA test battery was used to obtain pretest/posttest data. The battery assessed sentence segmentation, syllable/onset and rime/phoneme segmentation, syllable/onset and rime/phoneme blending, rhyme detection, alliteration, phoneme deletion, and sound-letter knowledge. The authors concluded that preschool children can develop PA before beginning to read. Pre-literate rhyme detection was determined to be the best predictor of initial reading development and this skill discriminates between future good readers and poor readers.

Studies With School-Aged Children

Hatcher et al. (1994) conducted a longitudinal study to determine the effects of PA on reading development. One hundred twenty-five seven-year old children who displayed reading difficulties participated in this study. The children were randomly assigned to four groups: (1) Reading with Phonology group, (2) Reading Alone group, (3) Phonology Alone group, and (4) Control group to determine which instructional intervention provided the greatest amount of

change. Pretest and posttest data were collected using a series of standardized and nonstandardized tests. Measures were collected for reading, spelling, arithmetic, and PA skills (deletion, blending, segmentation, and categorization). The Phonology Alone group demonstrated a statistically reliable amount of change with the PA tasks, and the Reading with Phonology group demonstrated a statistically reliable amount of change with the reading tasks. Therefore, the results of this study conclude that the incorporation of PA tasks with formal reading instruction provides the most effective means in improving literacy skills.

Another study that supports the use of PA instruction was conducted by Ball and Blachman (1991). This study was conducted to determine the effects on reading when children in kindergarten were trained on PA tasks. Ninety students from three public schools were randomly assigned to one of three groups: (1) Phonological awareness training group, (2) Language activities training group, and (3) a Control group. Standardized and nonstandardized measures were collected on phoneme segmentation, letter naming/sound-letter correspondence, reading, and spelling. The PA training consisted of (1) “say it” and “move” activities, (2) segmentation, and (3) letter-name and sound-letter correspondence. The language training consisted of (1) vocabulary building, (2) listening, (3) semantic categorization, and (4) letter-name and sound-letter correspondence. The PA training was determined to contribute to the greatest amount of change in phoneme segmentation, early reading, and spelling skills. The group that received the language training did not show significant improvement when compared to the control group in their phoneme segmentation, reading, or spelling skills. With regard to letter naming/sound-letter correspondence, all three groups scored approximately the same.

A study conducted by Juel, Griffith, and Gough (1986) revealed results similar to those of previous studies. One hundred twenty-nine first grade children from a large lower middle-class

school were enrolled in this study. Pretest/posttest measures were used to obtain nonstandardized measures of print awareness, cipher knowledge, PA, lexical knowledge, reading comprehension, and writing. Longitudinal data were collected as the students advanced from first grade through second grade. The rate at which each student excelled in his/her reading achievement was found to result directly from growth in PA, spelling-sound knowledge, and lexical knowledge. The authors concluded that without PA skills, exposure to print does little to promote spelling-sound knowledge.

Many researchers are still trying to answer the “chicken and egg” question of which came first. Is PA a prerequisite for learning to read or does PA develop as a consequence of being exposed to reading instruction (Yopp, 1992)? A great majority of research conducted supports the idea of PA as a powerful predictor of early reading achievement. However, a few studies reviewed offered a different perspective.

A one-year follow-up study (Byrne & Fielding-Barnsley, 1993) was conducted on the Byrne and Fielding-Barnsley (1991) original study. The children in the previous study were retested on PA, alphabetic knowledge, word identification, decoding, and spelling at the end of kindergarten. The study concluded that the experimental and control groups scored approximately the same with PA tasks and alphabetic knowledge. The authors concluded that alphabetic knowledge predicted literacy development, but stated that PA accounted for significant variance in decoding and spelling. The authors finally concluded that PA is most likely a consequence of literacy instruction rather than a cause.

Wimmer, Landerl, Linortner, and Hummer (1991) conducted three studies to determine if PA was a precursor to learning to read or a consequence of reading instruction. The participants were 50 children enrolled in the first grade. Study One obtained measures on letter

knowledge, nonword reading, and vowel substitution. Study Two obtained measures on letter knowledge, reading, vowel substitution, and pseudoword repetition. Study Three obtained measures on letter knowledge, reading, vowel substitution, and syllable/phoneme counting. The authors reported that the development of PA emerges after the acquisition of the alphabet. They concluded that children who began the study without good PA skills developed good PA skills after the initiation of reading instruction.

Perfetti, Beck, Bell, and Hughes (1987) conducted a study with the goal of disproving the idea that PA is a necessary component for learning to read. Eighty-two first grade children were randomly divided into three groups: (1) Direct code group taught reading by a systematic program; (2) Readiness group taught reading through exercises and some direct code instruction; and (3) Rockets group taught reading in small groups with phonics and no direct code instruction. Pretest/posttest measures were collected for PA skills (sound blending, sound isolation, and sound deletion) and reading skills. The authors concluded that PA and learning to read have a reciprocal relationship. They suggested that gains in reading enabled gains in PA which enabled further gains in reading.

Conclusion

Regardless of the “chicken and egg” debate, most researchers agree that PA is an extremely important component of reading development that should be targeted during the early preschool and kindergarten years. The majority of studies demonstrate that PA training in young children results in positive gains in their pre-literacy and literacy skills. Limitations of these studies, however, are that many have focused on kindergarten/first grade children and/or had a limited focus on PA abilities (e.g., phoneme identification). No experimental data on PA

training with younger preschool-aged children in a classroom setting incorporating a broader spectrum of PA skills could be found. Further, outcomes of PA training have generally examined only a narrow aspect of PA or metalinguistic skills. Information on reading readiness, print and alphabetic knowledge, in addition to PA skills and general language skills are lacking or are inconsistently included.

The purpose of this study, therefore, is to assess the effectiveness of PA training with typically developing preschool children in a classroom setting. Specifically, PA training will incorporate a range of PA skills such as rhyming, sound/syllable matching, sound/syllable isolation, sound/syllable blending, sound/syllable addition or substitution, and sound/syllable segmentation. Additionally, training outcomes will be assessed along a broad spectrum of PA abilities, pre-literacy skills, and general language abilities.

CHAPTER 2

METHODS

In this study, typically developing children from different preschool classes were investigated to determine the effectiveness of PA training in a classroom setting. The children were four years of age and attended a local private preschool. One preschool class received the PA training whereas the other preschool class served as the control group and did not receive any PA training.

Participants

The children in the preschool classes who participated in this study were selected based on the following inclusionary requirements: (1) normal hearing, as determined by a pure-tone audiometric screening at 25 dB presented at 500, 1000, 2000, and 4000 Hertz; (2) completion of the Fluharty Preschool Speech and Language Screening Test (Fluharty, 2001); (3) no known history of speech-language, motor, visual, or neurological impairment, as reported in the case history information; and (4) English must be their first language and the children must reside in a monolingual English-speaking home. As part of the case history (See Appendix A) parents were also asked to complete a section that provided demographic information. Assignment of socioeconomic status (SES) levels were based on Eilers et al. (1993). See Appendix B.

Based on these inclusionary criteria, 21 children participated in this study. Eleven children (8 girls; 3 boys) participated in the Experimental group while 10 children (6 girls; 4 boys) participated in the Control group. The mean age of the children was 4;7 (range = 4;1 to 5;1). Participant characteristics are presented in Table 1 along with the assigned SES levels.

Table 1
Participant Characteristics

Subject	Age	Gender	SES Level
C1	4;11	F	1
C2	4;1	M	3
C3	4;9	F	2
C4	4;2	M	4
C5	4;5	F	2
C6	4;11	M	1
C7	4;9	F	2
C8	4;2	F	1
C9	5;1	M	1
C10	4;11	F	1
E1	4;11	M	1
E2	4;5	F	1
E3	4;7	F	1
E4	4;5	F	2
E5	4;5	M	1
E6	4;3	F	2
E7	4;6	F	1
E8	4;4	F	1
E9	4;6	F	1
E10	4;7	M	3
E11	4;6	F	1

Experimental Design

An experimental Pretest-Posttest Control-Group design was used in this study. In this mixed design, two groups are formed by assigning half of the participants to the experimental group and half to the control group. Both groups were pretested and posttested in the same manner and at the same time in the study. The bivalent independent variable was the PA training and it assumed two values: presence versus absence of PA training. The dependent variables were the gains in scores on the following measures: speech production, literacy measures, PA measures, receptive vocabulary measures, and language measures from the pretest and posttest. Internal validity was accounted for by selecting the participants (experimental group, control

group) on the basis of the inclusionary criteria discussed earlier. Table 2 summarizes the areas that were assessed and the dependent variables examined.

Table 2
Areas Assessed With Dependent Variables

Areas assessed	Measures of assessment/Dependent Variable
Speech	<u>Goldman-Fristoe Test of Articulation-2</u> : Standard score
Receptive Vocabulary	<u>Peabody Picture Vocabulary Test-III</u> : Standard Score
Language	<u>Language sample</u> : Total number of words (TNW) Total number of different words (NDW) Mean length utterance (MLU) Percent correct use of bound morphemes
Pre-literacy	<u>Phonological Awareness Literacy-Pre-Kindergarten</u> : Raw Score
Phonological awareness	<u>Phonological Awareness Literacy-Pre-Kindergarten</u> : Raw Score <u>Preschool Comprehensive Test of Phonological and Print Processing</u> : Raw Score

Procedures

Pretest/Posttest

Once participants were selected, pretest data were collected over a two-week period. Graduate students in speech-language pathology who were trained on the test procedures conducted the initial and final testing. The Phonological Awareness Literacy-Pre-Kindergarten (PALS-Pre-K) (Invernizzi, Sullivan, & Meier, 2001), Goldman-Fristoe Test of Articulation-2 (GFTA-2) (Goldman & Fristoe, 2000), Peabody Picture Vocabulary Test-III (PPVT-III) (Dunn & Dunn, 1997), Preschool Comprehensive Test of Phonological and Print Processing (P-CTOPPP) (Lonigan, Wagner, Torgesen, & Rashotte, 2002) were administered. In addition to

these tests, a 20 minute language sample was collected from each child. A standard set of toys was used to elicit a language sample. Specifically, a farm set was used with boys and a dollhouse was used for girls. The language samples were transcribed and analyzed using *Systematic Analysis of Language Transcripts (SALT)* (Miller & Chapman, 2000). At the end of the study, the posttest data were collected again over a two-week period using the same measures to determine the effectiveness of the PA training. Table 3 links the PA skills trained to its diagnostic measure.

Table 3
PA Skills Trained with Diagnostic Measure

Test	Skills trained
<u>PALS-Pre-K</u>	Rhyming Sound Matching
<u>P-CTOPPP</u>	Rhyming Sound/syllable matching Sound/syllable isolation Sound/syllable blending Sound/syllable segmentation Sound/syllable addition or substitution

PA Classroom Activities

The classroom PA training program was conducted by the author with the experimental class in one large group for 5 weeks with 20 minute sessions conducted three times a week. A variety of fun, play-based phonological activities were used with the class that incorporated the spectrum of PA skills (e.g., rhyming, sound/syllable matching, sound/syllable isolation, sound/syllable blending, sound/syllable addition or substitution, and sound/syllable segmentation). The goal of each activity was to heighten the children’s awareness of sounds in spoken language. These activities came from children’s literature, music, and games. The

children participated by singing, listening, answering questions, and following directions. The following is a list of the PA activities addressed during training:

1. Sound Matching/Sound Identification
2. Rhyming Activities
3. Sound Addition or Substitution Activities
4. Sound/Syllable Blending Activities
5. Sound/Syllable Segmentation Activities.

The author started with the earlier developing PA skills, such as matching and rhyming, and moved throughout the continuum of PA skills. These activities were rotated from easiest to hardest throughout the 5 week training period. The PA activities listed by the skill trained can be found in Appendix C. The daily class schedule of activities can be found in Appendix D.

Data Analysis

Dependent variable outcomes (pre, post), subject identification, and study group codes were entered into *Statistica* (2000) for statistical analysis. The two groups were first analyzed descriptively to describe each group and then a 2-way ANOVA with fixed effects was conducted with repeated measures between and within both groups. At each time point (pre/post), group responses were summarized by the mean and standard deviation. Probability levels of 0.05 or smaller indicated significant differences between group means.

Reliability

Reliability was conducted on the administration, scoring, and length of 20% of the initial and final language samples. The transcripts were re-transcribed by a second transcriber familiar with *SALT*. The percentage agreement between the two transcribers was 90% or greater.

CHAPTER 3

RESULTS

The purpose of this study was to assess the effectiveness of PA training with typically developing preschool children in a classroom setting. The PA training incorporated a range of PA skills and the training outcomes were assessed along a broad spectrum of PA abilities, pre-literacy skills, and general language abilities. The results will be discussed in terms of: (1) descriptive analysis of the test results for the control and experimental groups and (2) the change in the dependent variables between and within the control and experimental groups (2 x 2 Analysis of Variance (ANOVA)).

Descriptive Analysis

Descriptive statistics was used to describe the two groups at pretest and posttest. The raw scores of each of the subtests were added together to determine a composite score for the P-CTOPPP and PALS-Pre-K. Standard scores were determined for the PPVT-III and the GFTA-2. Mean scores were calculated for MLU, NDW, and TNW; and percentages were calculated for % Correct Use of Bound Morphemes.

Pretest/Posttest

Table 4 summarizes the mean and standard deviation for each group on each test during the pretest and posttest data collection. Notice that the two groups were similar on pretest and posttest measures for all tests and that each group scored relatively high (i.e., at or above 80, standard score >100). Also notice the large variation in group performances as indicated by the

large standard deviations. Interestingly, the Control group scored slightly higher than the Experimental group on the P-CTOPPP, PALS-Pre-K, PPVT-III, TNW, NDW, and % Correct Bound Morphemes on the pretests. The Control group scored slightly lower than the Experimental group on the G-FTA-2 and MLU. In the posttesting, the Experimental group scored slightly higher than the Control group on P-CTOPPP, PALS-Pre-K, GFTA-2, MLU, TNW, NDW, and % Correct Bound Morphemes. During posttesting, the Experimental group scored slightly lower than the Control group on only one test (PPVT-III). Thus, an upward trend was observed for the Experimental group in which scores were slightly higher than the Control group on all test measures (with exception of PPVT-III) even though they were lower than the Control group on the two pre-literacy test measures during pretesting.

Table 4
Descriptive Statistics for Pretest/Posttest Measures

Variable	Group	Number of children	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation
P-CTOPPP*	C	10	84.60 ^a	33.54	80.80 ^a	21.04
P-CTOPPP*	E	11	78.54 ^a	17.33	90.90 ^a	17.06
PALS-Pre-K**	C	10	133.10 ^a	42.37	94.80 ^a	21.88
PALS-Pre-K**	E	11	128.54 ^a	32.28	108.27 ^a	25.50
PPVT-III	C	10	116.40 ^b	13.24	117.00 ^b	13.68
PPVT-III	E	11	115.27 ^b	6.10	111.54 ^b	6.90
GFTA-2	C	10	105.20 ^b	9.48	105.20 ^b	11.12
GFTA-2	E	11	112.63 ^b	5.80	112.63 ^b	6.39
MLU	C	10	3.63 ^c	.75	3.45 ^c	.91
MLU	E	11	4.18 ^c	1.15	4.39 ^c	1.14
TNW	C	10	452.50 ^c	177.56	639.00 ^c	366.25
TNW	E	11	373.36 ^c	198.29	738.27 ^c	456.98
NDW	C	10	144.50 ^c	49.45	147.30 ^c	59.23
NDW	E	11	130.36 ^c	34.70	192.90 ^c	71.66
% Bound morphemes	C	10	96.80 ^d	4.61	96.90 ^d	5.27
% Bound morphemes	E	11	96.09 ^d	6.94	97.09 ^d	6.42

a = Raw Score b = Standard Score c = Mean Score d=Percentage

* Ceiling for P-CTOPPP = 130

**Ceiling for PALS-Pre-K = 131

Statistical Analysis with ANOVA

Each of the five measures assessed was analyzed using a 2-way ANOVA with fixed effects. The variables were assessed between and within the two groups.

P-CTOPPP

Table 5 summarizes the ANOVA for the P-CTOPPP. As indicated in this table, there was no significant difference between the groups on this measure ($F=.072033$, $p=.791291$). No

main effect for pretest and posttest data was observed within the two groups ($F=.420863$, $p=.524271$). As a result, there was no interaction between or within the two groups.

Table 5
P-CTOPPP

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	43.0554	19	597.7139	.072033	.791291
2	1	192.0701	19	456.3723	.420863	.524271
12	1	684.2606	19	456.3723	1.499348	.235738

PALS-Pre-K

Table 6 summarizes the ANOVA for the PALS-Pre-K. As indicated in this table, there was no significant difference between the groups for this measure ($F=.294470$, $p=.593679$). However, a main effect was observed within each group with pretest and posttest data ($F=7.126116$, $p=.015153$). There was no interaction between the two groups, indicating that the statistically significant difference with pre-posttest data occurred with both the control and experimental groups. No treatment effect was observed because the direction of effect was negative for both groups. Individual differences for the children were examined to account for this negative effect in both groups. In the Control group, 5 of the 10 children scored lower on the posttest. Of these 5 children, 3 did markedly worse. Specifically, this was determined if a child's score dropped 25 points or more on any subtest. Closer examination of these 3 children revealed that 2 children had poor alphabet knowledge (50% accuracy or below) and 1 child demonstrated a lower overall profile for PA skills. In the Experimental group, 5 of the 11 children scored lower on the posttest. Of these 5 children, only 2 scored significantly worse. Again closer examination of these 2 children revealed that both had poor alphabet knowledge.

Table 6
PALS-Pre-K

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	208.303	19	707.383	.294470	.593679
2	1	8985.335	19	1260.902	7.126116	.015153*
12	1	851.145	19	1260.902	.675028	.421495

PPVT-III

Table 7 summarizes the ANOVA for the PPVT-III. As indicated, there was no significant difference between groups for this measure ($F=.623392$, $p=.439532$). No main effect was observed within the groups for pretest or posttest data ($F=.742667$, $p=.399554$). As a result, there was no interaction between or within the two groups.

Table 7
PPVT-III

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	113.4580	19	182.0010	.623392	.439532
2	1	25.6139	19	34.4890	.742667	.399554
12	1	49.0424	19	34.4890	1.421973	.247759

G-FTA-2

Table 8 summarizes the ANOVA for the G-FTA-2. As indicated, there was no significant difference between groups for this measure ($F=4.279156$, $p=.052468$). No main effect was observed within the groups for pretest and posttest data ($F=0.0$, $p=1.000000$). As a result, there was no interaction between or within the two groups.

Table 8
G-FTA-2

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	579.3281	19	135.3837	4.279156	.052468
2	1	-.0000	19	5.0526	0.000000	1.000000
12	1	.0000	19	5.0526	.000000	1.000000

Language Sample

Four measures were collected from the language samples and each will be described below.

MLU

Table 9 summarizes the ANOVA for mean length utterance (MLU). As indicated in this table, there was no significant difference between groups for this measure ($F=3.662400$, $p=.070840$). No main effect was observed within the groups for pretest and posttest data ($F=.005430$, $p=.942026$). As a result, there was no interaction between or within the two groups.

Table 9
MLU

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	5.830878	19	1.592092	3.662400	.070840
2	1	.002576	19	.474413	.005430	.942026
12	1	.380910	19	.474413	.8702907	.381438

NDW

Table 10 summarizes the ANOVA for the total number of different used words (NDW). As indicated in this table, there was no significant difference between the groups ($F=.639659$, $p=.433720$). A main effect was observed within the groups for pretest and posttest data ($F=5.321143$, $p=.032499$) indicating that both groups scored higher on the posttest. An interaction was also observed indicating that one group performed significantly higher than the other for this measure ($F=4.448196$, $p=.048435$). A post hoc t-test was performed to determine which group performed higher. The results of the t-test indicated that the Experimental group made significant gains on this measure ($p=.01$). The results of the t-test are presented in Tables 11 and 12. This may be related to the experimental group's enriched vocabulary from the PA classroom activities. Although both groups had a significant increase in "talkativeness" as

indicated by a statistically significant increase in TNW in posttesting, only the Experimental group made statistically significant gains in vocabulary diversity which may be a reflection of the PA training.

Table 10
NDW

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	2594.25	19	4055.678	.639659	.433720
2	1	11183.41	19	2101.693	5.321143	.032499*
12	1	9348.74	19	2101.693	4.448196	.048435*

Table 11
t-test for Experimental Group (NDW)

	Mean	Standard Deviation	p value
Pretest	130.3636	34.70525	
Posttest	192.9091	71.66094	.019687*

Table 12
t-test for Control Group (NDW)

	Mean	Standard Deviation	p value
Pretest	144.5000	49.45761	
Posttest	147.3000	59.23409	.867383

TNW

Table 13 summarizes the ANOVA for the total number of words (TNW). As indicated in this table, there was no significant difference between the groups ($F=.008540$, $p=.927338$). A main effect was observed within the groups for pretest and posttest data ($F=9.398112$, $p=.006364$). However, no interaction was observed ($F=.983845$, $p=.333716$), indicating that both groups made gains from pretest to posttest. The statistically significant gains in TNW for both groups can most likely be attributed to the children's familiarity with the test measure and the testing environment.

Table 13
TNW

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	1062.0	19	124350.8	.008540	.927338
2	1	796326.6	19	84732.6	9.398112	.006364 *
12	1	83363.8	19	84732.6	.983845	.333716

Percent Bound Morphemes

Finally, Table 14 summarizes the ANOVA for the percent correct use of bound morphemes, there was no significant difference between the groups ($F=.013140$, $p=.909941$). No main effect was observed within the groups ($F=187313$, $p=.670035$) and there was no interaction ($F=.125392$, $p=.727158$).

Table 14
Percent Correct Use of Bound Morphemes

1=Group 2=PrePost	df	MS	df Error	MS error	F	p-level
1	1	.703247	19	53.51938	.013140	.909941
2	1	3.169048	19	16.91842	.187313	.670035
12	1	2.121428	19	16.91842	.125392	.727158

Summary

- 1) Did the PA training result in an increase on pre-literacy measures?
 - a. Yes. The Experimental group experienced an increase in scores (78.54 to 90.90) on the P-CTOPPP; however, the gains were not considered to be statistically significant. It was further noted that the Experimental group scored slightly lower than the Control group on the P-CTOPPP during pretesting, but scored slightly higher during posttesting.
 - b. Both groups experienced a decrease in scores on the PALS-Pre-K with a greater decrease in the Control group. Because of this negative effect, the children were examined individually to account for the decline in scores. Overall, 5 children (3 Control, 2 Experimental) scored significantly lower on the posttest. Four of the 5 children had poor alphabet knowledge, which has been reported to be a strong predictor for developing PA skills.
 - c. The lack of statistically significant gains may likely be due to several factors. First, pretest performance was high (i.e., raw score at or above 80, standard score >100) leaving little room for improvement. Secondly, the sample included children who were primarily from high SES families as indicated by 62% coming from professional or high-level management homes. Finally, the test measures (P-CTOPPP and PALS-Pre-K) may not be sensitive enough to measure changes over the short 5-week training period. Specifically, testing that assessed more domains and included more test items within a domain might be more sensitive to changes over shorter time periods.
- 2) Did the PA training result in an increase on speech measures?

- a. No. Both groups scored approximately the same on the pretest and posttest. With the exception of 4 children, all children scored above the 50th percentile on G-FTA-2 prior to the classroom activities.
- 3) Did the PA training result in an increase on general language abilities?
- a. No gains were noted on receptive language abilities. Both groups scored approximately the same on pretest and posttest for the PPVT-III. Gains were not expected for either group because this area was not trained during the PA program.
 - b. Gains were observed on measures of “talkativeness”. Specifically, the Experimental group scored significantly higher for TNW and NDW than the control group. This may be related to the Experimental group’s enriched vocabulary from the PA classroom activities. Although both groups had a significant increase in “talkativeness” as indicated by a statistically significant increase in TNW in posttesting, only the Experimental group made statistically significant gains in vocabulary diversity which may be a reflection of the PA training.
- 4) Although no statistically significant gains were noted in PA skills, anecdotal comments were reported from the teacher and the parents of the children in the Experimental group. An increase in phonological sensitivity was observed by the children performing the following activities at home or throughout the school day:
- a. Rhyming with the “Name Game Song”
 - b. Identifying words that have same sounds
 - c. Making new words

- d. Breaking words into syllables
 - e. Blending sounds together
- 5) In summary, the PA activities were enjoyed by the children in the Experimental group and therefore were determined to have high social valence. The children actively participated in the activities and remained engaged throughout the 20 minute activities.

CHAPTER 4

DISCUSSION

The purpose of this study was to assess the effectiveness of PA training with typically developing preschool children in a classroom setting. The PA training incorporated a range of PA skills and the training outcomes were assessed along a broad spectrum of PA abilities, pre-literacy skills, and general language abilities. In this sample of 21 children (10 Control, 11 Experimental), it was noted that the children's pretest performance was high on all measures. No main effects were observed for any of the test measures, with the exception of the Experimental group's statistically significant gains for TNW, NDW, and a negative effect on the PALS-Pre-K. Except for the PALS-Pre-K and PPVT-III, an upward trend was observed for the Experimental group. Based on the anecdotal comments from the Experimental group's teacher and parents, an increase in phonological sensitivity throughout the PA training program was observed. This increase in phonological sensitivity was not likely accounted for empirically possibly because (1) the pre-literacy and PA test measures used (P-CTOPPP, PALS-Pre-K) appeared not to be sensitive enough to measure the increases in PA skills observed, (2) there was not much room for improvement because of relatively high pretest scores, and (3) training time was very short. In this chapter, these findings will be discussed in relation to current literature, theoretical and clinical implications, and future research.

Comparison of Present Study to Literature

Although results did not demonstrate significant positive changes resulting from the PA classroom activities, several interesting findings were obtained. First, the fact that the

Experimental Group made greater gains than the Control group on the P-CTOPPP coupled with the anecdotal comments from parents and the classroom teacher suggest that there was an increase in the children's phonological sensitivity. This finding corresponds with other studies of PA training in preschool children (Byrne & Fielding Barnsley, 1991; Lundberg et al., 1988; Wood & Terrell, 1998). Specifically, children in the Experimental group evidenced greater gains in sound identification, rhyming, sound blending, and sound segmentation following the PA activities.

A second interesting finding was the significant negative main effect observed for both groups on the PALS-Pre-K. A closer inspection of individual children's performance on this test indicated that the negative difference was accounted by the significantly lower performance of 5 children (3 Control, 2 Experimental). As noted previously, 4 of these children also had limited alphabet knowledge. As suggested by several researchers (Bowey, 1994; Johnston, Anderson, & Holligan, 1996; Stahl & Murray, 1993; Wimmer et al., 1991), acquisition of alphabetic knowledge is a prerequisite to the emergence of PA skills.

Lastly, the differences in sample size and SES level may have contributed to the lack of statistically significant data. Many of the studies reviewed (Byrne & Fielding-Barnsley, 1991; Juel et al., 1986; Lundberg et al., 1988; Wimmer et al., 1991) had a large number of participants ($N > 100$) whereas this study had a limited number of participants ($N = 21$). Also, most of the children in this study came from a high SES level, whereas participants in previously reviewed studies (Juel et al.; Lundberg et al.; Wood & Terrell, 1998) fell in the middle to low SES level. The high SES level may account for the high scores (raw score at or above 80, standard score > 100) on the pretest leaving little to no room for the Experimental group's scores to improve following the PA training program.

Theoretical Implications

An interesting and intriguing theoretical implication of the findings from this investigation involves the learning process required in the PA classroom training activities, particularly as it applies to the 5 children (3 Control; 2 Experimental) whose performance on the PA and pre-literacy tests actually decreased significantly following the training. To account for these findings from a learning perspective, information from a dynamic systems theory was examined. According to Kelso (1995) and Tuller, Case, Ding, and Kelso (1994), dynamic systems theory (DST) is a relatively new approach to cognition that proposes that the mind is best viewed as a constantly shifting dynamic system that evolves over time. As such, DST represents a move away from traditional approaches of understanding cognitive processes that emphasize static representational structures. Within the last decade, dynamic systems models have been formulated to characterize intentional changes in learning (cf., Kelso, 1990; Schoner, Zanone, & Kelso, 1992; Zanone & Kelso, 1992). Using this model, an explanation for differences in learning, as well as the observed surface regressions in learning, will be attempted. Specifically, the constructs of competition and cooperation help account for individual differences in learning, while the dynamics of stability and instability will be appealed to for an account of apparent or surface learning regressions.

According to DST, individuals enter a learning situation with a certain degree of “pre-organization” that constrains the form that learning takes. As Kelso (1995) states, the problem is how to assess these constraints, which are not static but evolve dynamically with the learning process. Learning occurs as a specific modification of already existing knowledge, in the direction of the task to be learned. According to Kelso (1990, 1995), whether some tasks are learned more easily than others depends on the extent of cooperation or competition with

existing organizational tendencies (i.e., intrinsic dynamics). Competition and cooperation are hypothesized mechanisms that govern learning. Based on this model, an explanation of individual differences in learning might be offered. Some of the children in this study learned the different PA skills faster than others, but in the end, all of these children “got it”, as indicated by their improved performance and higher test scores.

A question still remains, however, regarding the apparent regressions of abilities in the five children. Again, appealing to DST, learning, as a dynamic process, does not just change one thing; it changes the entire system. Even intrinsically stable patterns will exhibit signs of destabilization. The theory, then, predicts instabilities during the learning process. DST states that transfer of new knowledge is dependent on an understanding and linkage between the things learned. Specifically, connections at an abstract level must be established. Within this perspective, it may be posited that the five children who exhibited surface regressions in their knowledge of PA and pre-literacy skills were not able to integrate the new information within an existing framework. A static account of learning might predict that the result would be no new learning and that these children’s test scores would not change; they would not improve, but there would be no prediction that there would be a decrease in performance. However, a dynamic account of learning would indicate that because the children did not have an existing framework on which to link the new information, the information actually set the existing framework in flux, or destabilized the system. Give this account, it predicts that “things get worse before they get better” as the destabilized system attempts to integrate the new information.

Therefore, what appears on the surface to be a decrease in learning or understanding of PA and pre-literacy skills may actually represent a step in the learning process that was captured

at a point in the learning process when the posttesting of the children in the study was completed. It might be predicted that testing these 5 children at a later point (perhaps a month later) would find that these children's scores at least went back to the pretest level or even higher. An implication based on this account might be to teach certain prerequisite skills in order to establish a minimum level of abstract knowledge that will support new learning. From the literature, the minimum level of knowledge required in learning new PA skills might be alphabetic knowledge, which has been reported in the literature to be a prerequisite to learning other PA skills, as well as a strong predictor of later reading abilities.

Clinical Implications for Assessment and Intervention

Assessment

Limited assessment tools are available to assess children's pre-literacy and PA skills. Several tests that are available are not standardized (cf., PALS-Pre-K, P-CTOPPP, Preschool Word and Print Awareness Assessment (Justice & Ezell, 2001), Get Ready to Read (Whitehurst & Lonigan, 2001). The tests that are standardized (e.g., The Phonological Awareness Test (PAT) (Robertson & Salter, 1997) , The Test of Phonological Awareness (TOPA) (Torgesen & Bryant, 1994)) assess a limited age range, which do not incorporate preschool children and generally only assess a narrow range of PA skills, such as sound categorization (i.e., TOPA). Further, these tests do not appear to be sensitive enough to capture changes in PA skills over short periods of time. As a consequence of these limitations, clinicians and researchers may need to use a combination of tests, as done in this study, to provide a fuller and more sensitive assessment of children's PA and pre-literacy skills. Also, tests may need to be developed that contain a more specific and larger quantity of test items that assess more of the PA domains.

Intervention

Many theorists (Adams & Bruck, 1995; Beck & Juel, 1995; Yopp, 1992) say that PA activities should be fun, play-based, and interactive activities that incorporate songs, chants, nursery rhymes, and books. Based on the findings from this study, these activities are ideal for children who have moderate to high alphabetic knowledge. However, the children who had poor alphabetic knowledge appeared to enjoy the play-based activities, but their PA skills did not improve. Based on these results, children with poor alphabetic knowledge will most likely need more explicit and intentional PA instruction including alphabetic instruction in conjunction with the fun play-based activities. Further, longer periods (beyond 5 weeks) may be necessary to promote PA skills (Brady & Moats, 1998; Yopp & Yopp, 2000).

Future Research

The need for future research in the area of PA training in preschool children is great. Several areas for future research will be discussed as extensions of the present study, as well as new lines of investigation. The following areas for future research will be discussed: (1) length of training period; (2) different sample populations; (3) sample size; (4) evidence-based research; (5) family literacy programs; and (6) different intervention contexts.

Length of Training Period

Researchers have not determined a specific amount of training time needed to promote PA skills. Yopp and Yopp (2000) and Brady and Moats (1998) indicated through their research that PA training programs can be conducted 2-3 days a week with 10-30 minute sessions for periods of 3 weeks to 2 years. This five-week study did not appear to be long enough to measure

a change in PA skills. Therefore, research needs to be conducted to determine the “ideal” range of time needed to demonstrate significant and sustained increases in PA skills in preschool children.

Different Sample Populations

The children in this study were mainly from high SES level families, which may account for the relatively high scores on all of the measures assessed. Future research that examines the PA and pre-literacy skills of children from poverty, with special needs, and from diverse linguistic and cultural populations will provide additional information about acquisition of these skills and the influence of PA training activities in different groups of learners.

Sample Size

Studies involving a larger number of participants are needed to provide the statistical power to examine differences in control and experimental groups. As noted in this study, there was large variation in group performances as indicated by the large standard deviation. With larger sample sizes, statistical differences between groups may be observed. For intervention studies, a sufficient sample size may involve 20 participants in each group.

Evidence-Based Research

Limited data are available on evidence-based models of PA training. Currently there are several commercial programs and workbooks available to train PA skills, such as “Road to the Code” (Blachman, Ball, Black, & Tangel, 2000), “Seeing Stars” (Bell, 1997), “Sounds Abound” (Catts & Vartiainen, 1996), and “Phonological Awareness Companion” (Wellington County

Board of Education, 1995). Future research is needed that compares the play-based classroom activities to these more structured programs. Further, comparison of classroom activities to individual one-on-one training would provide useful treatment efficacy data. Finally, there are several promising computer software programs for preschool aged children that train PA and pre-literacy skills (e.g., “Reader Rabbit’s Ready for Letters”, “Bailey’s Book House”, “The Playroom”). Examination of these programs in comparison to more traditional training methods would also provide useful information on acquisition and learning.

Family Literacy Programs

A logical extension of this study’s examination of classroom PA activities is the incorporation of families in facilitating their children’s PA and pre-literacy skills. Although numerous studies exist on the effectiveness of shared reading interventions on increased language skills (cf., Arnold, Lonigan, Whitehurst, & Epstein, 1994; Cronan, Cruz, & Arriaga, 1996), there are no studies that have examined this approach in facilitating PA skills in preschoolers. Ukrainetz-McFadden (1998) described an alternative approach to teaching PA using meaningful text experiences, but no data were presented on the effectiveness of this approach. Other studies (cf., Ezell & Justice, 1998; Justice & Ezell, 2000) have shown that a home-based reading intervention program that focused on the parents’ use of print-referencing behaviors significantly enhanced their children’s pre-literacy skills in print and word awareness. Future research that addresses a broader spectrum of PA skills within a shared reading intervention with parents and their children offers promising insights into alternative contexts for PA and pre-literacy learning.

Different Intervention Contexts

PA training has been reported in different contexts, including classrooms (cf., Whitehurst et al., 1999; Whitehurst et al., 1994) and clinics (cf., Gillon, 2000; Van Kleeck et al., 1998) and as recommended above, should be included at home with parents. An interesting future line of investigation would be examination of potential additive relationships between or among the different contexts of intervention.

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APPENDICES

Appendix A
Case History

Child's Name: _____ Birth date: _____

Parents/Guardians: _____

Home Address: _____

Street City Zip

Telephone: (home) _____
(work) _____

Teacher: _____

I. Birth and Early Development

Mother's health during pregnancy:

Any unusual problems at birth (Caesarian, breech birth, etc.):

Any problems immediately following birth or during the first two weeks of the infant's life (swallowing, feeding, sleeping, other):

At what ages did the following occur:

Sat alone unsupported _____ Crawled _____

Stood alone _____ Walked Alone _____

Fed self with spoon _____ Toilet trained _____

Dressed self _____

Is your child's coordination good _____ fair _____ poor _____

How would you describe your child's overall development?

II. Speech/Language Development

When did your child say his/her first words? _____

First sentences? _____

How does your child make his/her needs known: sentences _____

phrases _____ one or two words _____ sounds _____ gestures _____

How well is your child understood in his/her first language by:
(estimate in %) parents _____ other adults _____ brother and sisters _____
friends _____

How well is your child understood in English by: (estimate in %)
Parents _____ other adults _____ brothers and sisters _____ friends _____

How well does your child understand what is said to him/her in his/her first language?

How well does your child understand what is said to him/her in English?

What is the primary language spoken in the home? _____

Please add any additional information you feel will be helpful in understanding your child's speech?

III. General Health

Has your child had any of the following:

	Age	Duration	Hospitalized?
Tonsillitis			
Sinusitis			
Frequent colds			
Earaches			
Draining ears			
High fever			
Allergies			

Does your child have tubes in his/her ears? _____ Date: _____

Does your child have any vision problems? _____

Does your child have any physical handicaps? _____

How would you describe your child's general health?

IV. Family

Brothers and Sisters:

Name	Age	Grade	Speech/Hearing Problem?
------	-----	-------	-------------------------

Are there any hearing, speech, language, or developmental problems in the family (grandparents, parents, relatives)?

Education

Mother

What is the highest grade that you completed? 0 1-6 10-11 12
How many years of college or technical school did you complete? 1 2 3 4
How many years of graduate or professional school did you complete? _____

Father

What is the highest grade that you completed? 0 1-6 10-11 12
How many years of college or technical school did you complete? 1 2 3 4
How many years of graduate or professional school did you complete? _____

Employment

Mother

Are you presently employed? Yes No
If yes, what is your job title? _____
What are your job duties? _____

What type of industry do you work in, that is, what does your company produce or what services does your company provide? _____

Father

Are you presently employed? Yes No
If yes, what is your job title? _____
What are your job duties? _____

What type of industry do you work in, that is, what does your company produce or what services does your company provide? _____

Appendix B
SES Levels

SES LEVEL	EDUCATION	WORK	FAMILY
5 (LSES)	High school not completed	Unskilled worker	Single parent, unstable family
4	At least 1 parent completed high school, college not attempted	Blue collar employment	
3 (MSES)	Some college completed, but no college degree	Transitional white collar, non-management positions	
2	1 parent has a college degree	White collar, middle management, teachers, nurses, midscale proprietors	Two-parent home
1 (HSES)	Both parents have a college degree	Professional or high-level management	Stable, two-parent home

SES Assignment, adapted from Eilers et al. (1993).

Appendix C PA Activities

Sound Matching/Sound Identification Activities

- A simple song, such as the following lyrics song to the tune of “Jimmy Cracked Corn and I Don’t Care”, can be used to identify a word with a targeted sound. In the example below, the sound of the letter /d/ is sung, not the letter name.

Who has a /d/ word to share with us?
Who has a /d/ word to share with us?
Who has a /d/ word to share with us?
It must start with the /d/ sound!

The class sings together, then the teacher calls on individual children to volunteer words that begin with the /d/ sound. If a child said “dog”, the class would sing:

Dog is the word that starts with /d/
Dog is the word that starts with /d/
Dog is the word that starts with /d/
Dog starts with the /d/ sound.

- Find your partners

Distribute picture cards to each child so that each card can be matched with another that begins (or ends) with the same sound. Tell the children that once you give the signal, they are each to circulate and find a classmate whose card shares the same sound in the targeted position.

- Scavenger Hunt

Organize children into teams of about three. Give each team a bag or box that has on it a letter or picture of an object that begins with that letter. For example, one team has a bag with the letter M on it and a picture of a monkey; another team gets a bag with the letter S on it and a picture of a snake. Children are then set off on a scavenger hunt to find objects in the classroom that begin with their target sound. Children with the bag that has the letter P on it may find a pencil, pen, and paper to put in their bag. Give the children enough time and support to be successful, then bring them together to state their target sound and share their objects. Then they may return their objects, trade bags, and repeat the activity.

- Old MacDonald Had a Farm

In the previous activities, the children were told the individual sound and then asked to identify which of a number of words began with the sound or to generate their own examples. Children may also be asked to perform the reverse – given a word and asked to tell what sound occurs at the beginning, middle, or end of the word. The following song

encourages students to think about sounds in words. A single sound may be emphasized through the entire song, or each verse may focus on a different sound, as in the lyrics below sung to “Old MacDonald Had a Farm”:

What’s the sound that starts these words:

Turtle, time, and teeth?

(wait for a response from the children)

/t/ is the sound that starts these words:

Turtle, time, and teeth.

With a /t/, /t/ here, and a /t/, /t/ there,

Here a /t/, there a /t/, everywhere a /t/, /t/.

/t/ is the sound that starts these words:

Turtle, time, and teeth!

What’s the sound that starts these words:

Chicken, chin, and cheek?

(wait for a response from the children)

/ch/ is the sound that starts these words:

Chicken, chin, and cheek.

With a /ch/, /ch/ here, and a /ch/, /ch/ there,

Here a /ch /, there a /ch/, everywhere a /ch/, /ch/.

/ch/ is the sound that starts these words:

Chicken, chin, and cheek!

What’s the sound that starts these words:

Daddy, duck, and deep?

(wait for a response from the children)

/d/ is the sound that starts these words:

Daddy, duck, and deep.

With a /d/, /d/ here, and a /d/, /d/ there,

Here a /d/, there a /d/, everywhere a /d/, /d/.

/d/ is the sound that starts these words:

Daddy, duck, and deep!

Examples for focusing on middle and final sounds is as follows:

Medial:

What’s the sound in the middle of these words:

Leaf and deep and meat?

(wait for a response from the children)

/ee/ is the sound in the middle of these words:

Leaf and deep and meat.

With a /ee/, /ee/ here, and a /ee/, /ee/ there,

Here a /ee/, there a /ee/, everywhere a /ee/, /ee/.

/e/ is the sound in the middle of these words:

Leaf and deep and meat!

Final:

What's the sound at the end of these words:

Duck and cake and beak?

(wait for a response from the children)

/k/ is the sound at the end of these words:

Duck and cake and beak.

With a /k/, /k/ here, and a /k/, /k/ there,

Here a /k/, there a /k/, everywhere a /k/, /k/.

/k/ is the sound at the end of these words:

Duck and cake and beak!

Rhyming Activities

- The Hungry Thing

The Hungry Thing by Jan Slepian and Ann Seidler is a story about a creature that asks townspeople for food by pointing to a sign on his chest that says FEED ME. When the townspeople asks what he would like to eat, he responds, "Schmancakes!" The townspeople are flustered and attempt to determine what schmancakes are. After wise men and a cook offer ideas, a little boy declares that "Schmancakes sounds like fancakes sound like pancakes to me!" and the townspeople feed him some. The Hungry Thing asks for more and more food and each time the people try to identify what he wants.

Nonsense rhyming words are clues to what the Hungry Thing wants to eat. The townspeople—and the listener—must think of rhyming foods in order to make sense of the Hungry Thing's requests. As you read this book aloud, encourage the children to make predictions. The Hungry thing wants feetloaf. What can that be? Pause before the little boy in the story concludes that "feetloaf sounds like beetloaf sounds like (pause) meatloaf to me!" Allow the children to make guesses before you read "meatloaf".

After reading the book, pull out a lunchbag and announce how hungry you are. Look into the bag and tell the children what you have for lunch today. "Ah! Mogurt! I love mogurt!" Encourage the children to guess what mogurt is. Once they have figured out that mogurt is yogurt, take it out of the bag to show them and ask them how they knew. Repeat this with three or four other food items you have in the lunchbag.

Next, provide the children with paperbags, paper, and markers (or magazines with pictures of food) so they can create their own lunchbags full of food. After they draw or select and cut out their favorite foods and put them in the bag, have each child sit with a partner and provide "clues" about what his or her bag contains. "I have a piece of nizza". The partner's task is to determine what "nizza" is.

You may also create a center with plastic foods and lunchbags. Children will play with these items, retelling the story and creating rhymes as they have their peers guess what they have in their bags.

You may also wish to follow a reading of the story with placing a FEED ME sign around your neck. Distribute cards with pictures of foods and begin making requests using nonsense rhymes: “Feed me the nandwich.” The child who holds the picture of the food you request brings it to you where you pretend to gobble it up. Give volunteers the opportunity to be the Hungry Thing as well.

The *Hungry Thing Returns* and *The Hungry Thing Goes to a Restaurant* are two additional books by the authors that follow the same pattern. Read these at a later time and include menus and food trays at a center so children may engage in play with these items, too.

Sound Addition or Substitution Activities

Adding or substituting sounds in words in familiar songs may also help children begin to focus on the sounds that make up their speech.

- Someone’s in the kitchen with Dinah

“Fe-Fi-Fiddly-i-o” can become “Be-Bi-biddly-i-o” or “Ke-Ki-Kiddly-i-o” and so on. Children may insert consonant sounds, blends, or diphthongs, as follows (sung according to the lyrics “Someone’s in the kitchen with Dinah”):

I have a song that we can sing
I have a song that we can sing
I have a song that we can sing
It goes something like this:
Fe-Fi-Fiddly-i-o
Fe-Fi-Fiddly-i-o-o-o-o
Fe-Fi-Fiddly-i-ooooo
Now try it with the /z/ sound!

Ze-Zi-Ziddly-i-o
Ze-Zi-Ziddly-i-o-o-o-o
Ze-Zi-Ziddly-i-ooooo
Now try it with the /br/ sound!

Bre-Bri-Briddly-i-o
Bre-Bri-Briddly-i-o-o-o-o
Bre-Bri-Briddly-i-ooooo
Now try it with the /ch/ sound!

Che-Chi-chiddly-i-o
Che-Chi-chiddly-i-o-o-o-o
Che-Chi-chiddly-i-ooooo
Che-Chi-chiddly-i-o!

The same type of substitutions may be done with the “ee-igh, ee-igh, oh! Sections in “Old MacDonald Had a Farm”. For example, “ee-igh, ee-igh, oh!” may be sung as “Bee-bigh, bee-bigh, boh!” or “See-sigh, see-sigh, soh!”, etc.

- The Name Game Song

The Name Game song is an excellent way to practice sound substitution skills with the names of the students in a class. (“Let’s do Donna, Donna Donna Bo Bonna, Banana Fanna fo Fonna, Fe fi Mo Monna, Donna.”).

- Cock-a-doodle-moo!

In the book *Cock-a-doodle-moo!* By Bernard Most, a rooster wakes up one morning to discover that he cannot crow above a whisper and the farm animals keep sleeping. “Z-z-z-cheep” snore the chicks; “Z-z-z-quack” snore the ducks. The rooster tries to teach the cow to cock-a-doodle-doo so that she can wake up the farm animals. The cow struggles with this task, substituting phonemes in many ways. She says, “Mock-a-moodle-moo!” and “Rock-a-poodle-moo!”. The farm animals wake up with a laugh: “Oink-ha!” “Quack-ha!”, “meow-ha!” etc.

After reading the story, think about farm animals not mentioned. How would the author have a goat snore? A sheep snore? How would an awakening horse sound? Reread each of the ways that the cow tried to crow. Have your students think of other ways to say “cock-a-doodle-doo”. You may want to write some of their ideas on chart paper or on the chalkboard, adding letters to the phonemic awareness activity. Write “cock-a-doodle-doo”, erase the initial letters, and replace them with letters suggested by the children.

Then think of other alterations. What if the situation were changed and the pig tried to teach the cow to oink? What might the cow’s attempts at oinking sound like?

Place plastic farm animals at a center. Leave the book at the center, too. The children will retell the story and play with sounds as they manipulate the animals.

- I Like To Eat Apples and Bananas

This is a tape that the children can sing along with.

I like to eat, eat, eat, eat
I like to eat, apples and bananas
I like to eat, eat, eat, eat
I like to eat, apples and bananas

Now try it with other vowel sounds /o, u/ etc,

I like to oat, oat, oat, oat

I like to oat, opples and bononos

I like to oat, oat, oat, oat

I like to oat, opples, and bononos

Sound/Syllable Blending Activities

Blending requires children to manipulate individual sounds by combining them to form a word. Given a series of isolated sounds (e.g., /b/ - /a/ - /t/), children blend them together (e.g., “bat”).

- What am I thinking of?

In this activity, the teacher tells the class s/he is thinking of an animal, for example (any category may be used; even correlated with a current unit or instructional theme). The teacher then gives them a cue – the separate sounds in the word. If the teacher was thinking of a cow, s/he tells the class that the animal is a “/k/ - /ow/”, articulating each of the sounds separately. The children, then must blend the sounds together to discover the animal the teacher has in mind.

To increase motivation, the teacher may use picture cards and face them away from the children, give the segmented clue, then turn the picture around once the children have guessed. Or, the teacher may make use of a toy box or grab bag, peeking inside and saying, “I see a toy /d/ - /u/ - /k/ in here. Who knows what I see?”

- If you think you know this word, shout it out!

Changing the lyrics to the song “If you’re happy and you know it, clap your hands!”, can provide another sound blending activity:

If you think you know this word, shout it out!

If you think you know this word, shout it out!

If you think you know this word,

Then tell me what you’ve hear,

If you think you know this word, shout it out!

(teacher says a segmented word such as /k/-/a/-/t/, and children respond by saying the blended word)

The verse can be repeated several times with different words. Eventually, individual children will be able to contribute the segmented sounds for their peers to blend.

- Clap, Clap, Clap Your Hands

In this example, we modify “Clap, clap, clap your hands” to encourage blending syllables. The first two verses are traditional, followed by an adaptation.

Clap, clap, clap your hands,
Clap your hands together.
Clap, clap, clap your hands,
Clap your hands together.

Snap, snap, snap your fingers.
Snap your fingers together.
Snap, snap, snap your fingers.
Snap your fingers together.

Say, say, say these parts.
Say these parts together.
Say, say, say these parts,
Say these parts together:
Teacher: moun (pause) tain (children respond, “mountain!”)
Teacher: love (pause) ly (children respond, “lovely!”)
Teacher: un (pause) der (children respond, “under!”)
Teacher: tea (pause) cher (children respond, “teacher!”)

Sound/Syllable Segmentation Activities

Segmenting the sounds in a word is one of the more difficult phonological awareness tasks and it is highly related to later success in decoding words. Segmenting refers to the act of isolating the sounds in a spoken word. One activity to begin working with is to have children segment just the first sound in a word. Iteration, or sound repetition activities may be useful. For example, when singing “Pop Goes the Weasel,” the teacher may encourage the children to sing “P-p-p-p-p-POP goes the weasel!” for the final line in the song. This iterating technique may be used with children’s names, too. For example, Catherine may be said as “C-C-C-Catherine” or Joe may be said as “J-J-J-Joe”. Sounds may be drawn out and exaggerated as a way to draw attention to them. Linda becomes “Llllllll-inda”, Sam becomes “Sssssss-am”.

- Listen, Listen, to My Word

Children who are successful at each of the preceding activities may be able to successfully perform a complete segmentation task in which each sound in a spoken word is separated from the others. Singing to the tune, “Twinkle, Twinkle, Little Star”, the following lyrics require children to segment entire words:

Listen, listen
To my word
Then tell me all the sounds you heard: race

(slowly)
/r/ is one sound
/a/ is two
/s/ is last in race
It's true.

Listen, listen
To my word
Then tell me all the sounds you heard: coat
(slowly)
/k/ is one sound
/o/ is two
/t/ is last in coat
It's true.

Thanks for listening
To my words
And telling all the sounds you heard!

It's best to use words with no more than three sounds. You can adapt the lyrics for only 2 sounds:

Listen, listen
To my word
Then tell me all the sounds you heard: go
(slowly)
/g/ is one sound
/o/ is two
And that is all in go
It's true.

The above activities focused on segmenting individual sounds, but children can also segment words into syllables. Segmenting words into syllables is an easier task than segmenting words into sounds. Below are activities with syllable manipulation:

- How many syllables in a name?

Read the story *Tikki Tikki Tembo* by Arlene Mosel about a pair of Chinese brothers, one of whom has a very long name ("Tikki tikki Tembo No Sa Rembo chari Bari ruchi Pip Peri Pembo") and the other of whom has a very short name ("Chang"). After reading and discussing the story, encourage your students to say the two boys' names. Say them again and this time clap with each syllable that is said. Tikki Tikki Tembo's name will have 21 claps. Chang's name will receive one clap.

Even if you don't have access to this book, you can have the students try clapping the syllables in their own names. As a group, say each child's name and clap as you separate the

syllables. “Erica” would be said “Er” (with a clap)-“i” (clap)- “ca” (clap). “Richard” would be said with two claps. Further develop the activity by placing colored pieces of paper in a pocket chart as you say each syllable in a particular child’s name. Point to each piece of paper as you say each syllable. Later, let children work at tables to glue the appropriate number of colored pieces on a piece of drawing paper to represent the number of syllables in their names. For example, Erica takes three pieces of colored paper from a pile and glues them side by side at the top of a piece of drawing paper. Afterwards, children move around the room with their papers in hand and group themselves with others who have the same number of colored pieces glued on the drawing paper. Ask each child in a group to say his/her name. Encourage all students to say the syllables as each name is slowly said. Comment that they do, indeed, each have the target number of syllables (Yes! Jack, Nick, Sam, and Lee each have one beat! Let’s go to our next group. Let’s say their names, etc.). Develop a bar graph reflecting the number of students that have a given number of syllables in their names.

As a follow-up activity, you may wish to use clapping when taking attendance for several days, clapping the number of syllables as you call each child’s name. And at dismissal time you may clap once and anyone with a one-syllable name may leave. Clap twice and students with two-syllable names may leave, etc.

Later share the story *Tingo Tango Mango Tree* by Marcia Vaughan in which an iguana is named Sombala Bombala Rombala Roh, a flamingo is named Kokio Loki Mokio Koh, a parrot is named dillaby Dallaby Doh, a turtle is named Nanaba Panaba Tanaba Goh, and a bat is named Bitteo Biteo.

- Humpty Dumpty

This familiar nursery rhyme can be used in a syllable blending activity. Each child should have about five separate cubes of the type that can be snapped together. Recite the nursery rhyme. Tell the children that Humpty Dumpty broke and that you have some broken words, too. Ask them if they can help to put the words back together again. Say the parts of a word (e.g., “Pop-si-cle”) and ask the children to repeat the parts by picking up a cube for each part they say. In this example, the children pick up three cubes, one at a time. Then they snap the cubes together, saying each part and then the entire word. Are they able to help Humpty Dumpty? Repeat the process reciting the poem and then asking the children to put together a new “broken word”.

- Teacher, May We?

Adapted from the game “Mother May I?”, students line up some distance away and face you. Give directions that require children to count the number of syllables in a word such as, “You may jump the number of times as there are syllables (beat or chunks) in the word bunny.

Students respond, “Teacher, may we?” With your affirmative response, the children say “Bun—ny” and each child moves two jumps forward. Alter the number of syllables in the words you provide, moving from one syllable words (“good”) to four or more syllables (“motorcycle”) and vary the types of movement the students may make (e.g., take small steps, giant steps, skip). The first student to reach you may give the directions on the next round.

- Going on a Word Hunt

Read *We’re going on a Bear Hunt* by Michael Rosen. Then suggest to the children that you go on a word hunt. Have children sit on the floor with their feet together and their knees bent up. Everyone slaps their toes, then slaps their knees with the beat of the chant. Keep the rhythm going throughout the chant. The teacher begins and the students echo.

Teacher: Going on a word hunt!
 Slap toes slap knees slap toes slap knees

Children: Going on a word hunt!
 Slap toes slap knees slap toes slap knees

Teacher: What’s this word?
 Slap toes slap knees slap toes slap knees

Children: What’s this word?
 Slap toes slap knees slap toes slap knees

Teacher: /m/ (pause) /ap/
 Slap toes slap knees slap toes slap knees

Children: /m/ (pause) /ap/
 Slap toes slap knees slap toes slap knees

Together: mmmmmmmmmmmmmmmmmap map!
 Slap toes slap knees slap toes slap knees

Use single syllable words such as light, six, man, van, no, zoo, fist. It is also recommended that you use words that begin with continuant sounds (e.g., /f/, /l/, /m/, /n/, /r/, /s/, /v/, /y/, /z/, /th/, /sh/, and vowels) so that they can be elongated as hands are sliding from the toes to the knees for the final part of the chant.

- Make a word

Select a rime unit, such as “at” to focus upon. Have a card with the letters “at” written on it. In a bag have letter cards that may serve as the onset for this family. A child draws a card from the bag. The class says the sound of the letter drawn, blends it with the “at” and determines whether or not a real word is made. Students give a thumbs up or thumbs down.

Appendix D
Schedule of Activities

October 2002						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23 Sound Matching "Jimmy cracked corn and I don't care" Find your partner	24 Rhyming "The Hungry Thing" Lunchbag	25 Sound Substitution "Someone's in the kitchen with Dinah" Name game song	26
27	28	29 Blending "What am I thinking of?" Clap your hands	30 Segmentation "Listen, listen to my word" Humpty Dumpty	31		

November 2002

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Sound Matching Old MacDonald had a farm	2
3		4 Rhyming "The Hungry Thing Returns" - menus and food trays	5	6 Segmentation Teacher, May we? Make a word	7	8 Blending "If you know this word, shout it out!" Clap, clap your hands	9
10		11 Segmentation How many syllables in a name? ("Tikki Tikki Tembo")	12	13 Substitution "Cock-a-doodle-moo" - alternations (other farm animals; pig teaches cow to oink)	14	15 Matching Scavenger Hunt (initial and final sounds) Old MacDonald had a farm	16
17		18 Segmentation Iteration/Sound Repetition (Pop Goes the Weasel; children's names)	19	20 Rhyming "The Hungry Thing Goes to a Restaurant" - menus and food trays	21	22 Substitution "I like to eat apples and bananas" Segmentation "Tingo Tango Mango Tree"	23

East Tennessee State University
INFORMED CONSENT

PRINCIPAL INVESTIGATOR: Sara Phelps, B.S.

PROJECT TITLE: Phonological (Sound) Awareness Training in a Preschool Classroom of Typically Developing Children

This is a research project. This Informed Consent will explain about being a research participant in an experiment. It is important that you read this material carefully and then decide if you wish your child to be a volunteer.

PURPOSE

The purpose of this research study is as follows:

- 1) To examine how effective the use of sound awareness activities (such as sound rhyming, sound matching) are in children's development of pre-reading skills in a preschool classroom.
- 2) To compare a preschool classroom that received sound awareness activities to a preschool classroom that did not receive sound awareness activities.

DURATION

To be included in the study, children must complete a battery of tests that will take approximately 1 hour to complete. Children in the preschool classroom that receive sound awareness training will participate in a maximum of fifteen 20-minute classroom sessions over a five-week period. The children included in this study will also complete a series of pre/post tests that will be given to assess their sound awareness skills, pre-literacy development, language skills, and speech skills at the beginning and end of the study. These tests will take approximately 2 hours to complete.

PROCEDURES

A battery of tests will be administered to assess your child's speech, language and hearing skills. These will include a hearing screening, an articulation (speech) test, two language tests (one that will assess your child's understanding of certain vocabulary words and one that will assess your child's understanding of certain preschool concepts), and a brief case history of your child's speech and language development. If your child qualifies for the study, a series of standardized tests will be administered at the beginning and the end of this research study. These will include a pre-literacy test (e.g., print awareness, knowledge of the alphabet and its functions, and understanding of print conventions), a phonological (sound) awareness test, and a language sample to assess your child's pre-literacy development, sound awareness, and overall language development.

Following the initial tests, a variety of fun, play-based sound awareness activities will be used in the children's preschool classroom to heighten their awareness of sounds in spoken language. These sound awareness activities will include:

- Sound rhyming (e.g., the song "Down By the Bay" will be used and the children are asked to create new rhyming lyrics)

- Sound matching (e.g., identify words that start with the sound “k”)
- Sound isolation (e.g., children are given a word and asked to determine what sound is in the initial position)
- Sound blending (e.g., children are presented a word in its isolated sound “c – a – t” and asked to blend the sounds together to form “cat”)
- Sound addition or substitution (e.g., The Name Game)
- Sound segmentation (e.g., S-S-S-Sara or Ssssssara).

POSSIBLE RISKS/DISCOMFORTS

The proposed procedures do not entail any risk exposure beyond the possibility of boredom or fatigue which will be addressed with short breaks. The assessment and intervention procedures detailed within this proposal have been completed with numerous children and no adverse consequences have been reported. The methodology does not include aversive training procedures (e.g., punishment or negative reinforcement).

BENEFITS

The possible benefits of your child’s participation include:

- 1) Obtaining an extensive evaluation of your child’s speech, language, and phonological (sound) awareness skills.
- 2) The development of phonological (sound) awareness skills that are necessary pre-reading skills.
- 3) Society may gain information concerning the importance of phonological (sound) awareness training in preschool children to develop their reading readiness skills.

CONTACT FOR QUESTIONS

If you have any further questions about this study, you may call Sara Phelps at (423) 928-3336 or Dr. Lynn Williams at (423) 439-7188. You may call the Chairman of the Institutional Review Board at (423) 439-6134 for any questions you may have about your child’s rights as a research subject.

CONFIDENTIALITY

Every attempt will be made to see that my study results are kept confidential. A copy of the records from this study will be stored in Dr. Lynn Williams’ office (201B Lamb Hall) in a locked file cabinet, for at least 10 years after the end of this research. The results of this study may be published and/or presented at meetings without naming your child as a subject. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the East Tennessee State University Institutional Review Board, and the ETSU Department of Communicative Disorders have access to the study records. Your child’s records will be kept completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above.

COMPENSATION FOR MEDICAL TREATMENT

East Tennessee State University (ETSU) will pay the cost of emergency first aid for any injury which may happen as a result of your child being in this study. They will not pay for any other medical treatment. Claims against ETSU or any of its agents or employees may be submitted to

VITA

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