Helping Preschool Children Acquire Critical Literacy Skills Through Parent Training and Intervention

by

Geralyn G. Murray

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Approved by

Edna G. Brabham, Chair, Professor, Curriculum and Teaching
Angela Love, Associate Professor, Curriculum and Teaching
Craig B. Darch, Professor, Special Education, Rehabilitation, and Counseling

Abstract

Parents of young children often wonder how they can prepare their preschoolers to read. Many understand the importance of reading to their children and teaching the alphabet but they are unaware of another critical literacy skill needed for children to comprehend the reading process, phoneme awareness. In this study 34 preschool children, 3 to 5 years of age, received informal instruction from parents through conversations during story reading. Control group children discussed story vocabulary, plot, and a sequence of print concepts featured in a series of 8 short books. Experimental group children also discussed story vocabulary and plot, but instruction focused on identifying a new phoneme featured in each book. Pretests, posttests, and delayed posttests were administered to children before and after the intervention, and data were analyzed with ANCOVAs. Children in the experimental group made significantly greater gains than did children in the control group on three measures: two phoneme identity tests and the phonetic cue reading task, a measure of early decoding ability. Children in the treated control group made significantly greater gains on a print concepts test than did children in the experimental group. Results suggest that parents can be effective instructors in teaching children both print concepts and phoneme awareness.

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List of Abbreviations

ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
AUELC	Auburn University Early Learning Center
CAP	Concepts About Print
DCT	Dual Coding Theory
DIBELS	Dynamic Indicators of Basic Early Literacy Skills
K-1	Grades Kindergarten to First Grade
LR	Letter Recognition
NAEP	National Assessment of Educational Progress
NCES	National Center for Education Statistics
NICHHD	National Institute for Child Health and Human Development
NRP	National Reading Panel
PA	Phoneme Awareness
PCR	Phonetic Cue Reading
Pre-K	Prekindergarten
PS	Phonological Sensitivity
SES	Socio-Economic-Status
SBRR	Scientifically Based Reading Research
TPI	Test of Phoneme Identities
WISC	Wechsler Intelligence Scale for Children

CHAPTER I

INTRODUCTION TO THE RESEARCH

When my children were young, I cared for them and many other preschool children in my home-based childcare center. Literacy development was an ongoing daily event but not in any formal sense. I was not fully aware of the benefits of reading children's literature, reciting nursery rhymes, laughing with children at Dr. Seuss's alphabet book characters, and forever playing word games with alliteration and rhyme. Like most parents of preschool children, I knew the importance of teaching children the alphabet, but beyond that there was not much information available at the time on how to prepare them for literacy instruction.

When I became a teacher and then a graduate student, I came to realize that learning the alphabet was not enough to ensure that children have the prerequisite skills for learning to read. In a review of the literature of scientific research in reading, the National Reading Panel (NRP) found that phoneme awareness (PA) is a reliable predictor of reading achievement. Children who are aware of individual speech units in spoken language, i.e., phonemes, have PA. There is, however, a lack of research on preschool acquisition of PA and research that informs us of the effectiveness of parents as teachers of PA (National Institute of Child Health and Human Development [NICHHD], 2000). This study, therefore, addressed the problem of a lack of research information on parents' ability to teach preschool children about phonemes in spoken words. The report of the NRP stated the problem as follows:

> Many parents of preschoolers are anxious to help their children acquire the knowledge and skills they need to become successful when they enter school and

> begin reading instruction. However, none of the studies reviewed utilized parents as trainers. Research is needed to address this gap in our knowledge. In addition to informal activities that parents might use to draw children's attention to sounds in words, the effectiveness of activities that help parents teach letters to preschoolers might be explored and assessed. (NICHHD, 2000, p. 2-45)

This study focused on answering the following broad research questions. Can pre-literate, preschool children who receive instruction in phoneme identities from their parents demonstrate that they have PA? Is PA a factor in children's ability to use letter-sound knowledge to identify words in a forced choice test called Phonetic Cue Reading? Does the child's age or amount of time spent on instruction have an effect on literacy outcome measures? Formal statements for each component of these research questions and their corresponding hypotheses are included at the end of this chapter.

Background on the Problem

Parents play a vital role in preschool children's emerging literacy. When parents frequently read aloud, children may acquire listening comprehension and vocabulary. They may learn to recite the alphabet, recognize letters, learn key words associated with letters, and even produce letter sounds. However, it does not follow that children acquire PA through immersion in a literate environment (Justice, Skibbe, McGinty, Piasta, & Petrill, 2011). Scientifically based reading research (SBRR) confirms that early intervention rather than immersion can help even preschool children develop the most elusive prerequisite skill of reading, PA (Byrne, 1996; Byrne & Fielding-Barnsley, 1991; Juel, Griffith, & Gough, 1986; Murray, 2006).

Because PA typically does not occur naturally, schools teach a variety of PA tasks to beginners to help them acquire PA. However, many tasks are too difficult because they require

manipulation of phonemes. If children cannot recognize that an isolated phoneme is embedded in a spoken word, they will probably not be able to manipulate it. For example, the phoneme segmentation task requires children to break a word into individual phoneme segments: the word *trip* would be pronounced as /t//r//i//p/ if properly segmented. To arrive at a correct response, orthographic knowledge and a functional understanding of how to perform the manipulation task would be needed (Bradley & Bryant, 1983; Murray, 1998). Many phonemes are coarticulated, and their pronunciation is altered when they are closely bound to other phonemes. This makes them difficult to perceive in speech such as the blend /tr/ in *trip,* which could be segmented as /t/ /r/ or /ch//r/. A phoneme identity task, on the other hand, requires simple recognition of a target phoneme embedded in a word. Rather than perform a phoneme manipulation task, children may be asked a question such as, "Do you hear /m/ in mice or nice?" (Murray, Smith, & Murray, 2000, p. 430). According to Byrne and Fielding-Barnsley (1990) it is possible for children to begin to develop PA by simply learning how to recognize or identify phonemes in spoken words before learning to do more difficult phoneme manipulation tasks that are commonly not acquired until the end of first grade. Research on the relative difficulty and development of PA tasks was conducted as early as the 1970s and was later confirmed by studies prior to the NRP review of the literature (Murray, 1998; Rosner, 1974; Stahl & Murray, 1994).

In the fall of 2010, an acquaintance informed me that her 4-year-old daughter was beginning to take an interest in reading. Being a librarian, she was eager to get her off to a good start, and she asked me what she could do to further her interest in reading. I offered to do some assessments to see what her child already knew before making any recommendations. In her preschool, she had been learning uppercase letters of the alphabet and was beginning to write them, but she was unable to complete most of the assessments I tried with her, including a test of

phoneme identities, recognition of upper and lowercase letters, and an oral blending task. After completing the assessments I was uncertain of what this mother could do to further her child's PA skills, so I offered to do some phoneme identity instruction at her daycare center if all parties were in agreement. I told her it would help me learn about teaching PA to preschool children and develop a research proposal for my dissertation.

Over the course of three and a half months, meeting twice each week, this young child began to show remarkable progress in learning to identify lowercase letters and their corresponding phonemes, identify phonemes in oral language, and apply her letter-sound knowledge in a simple reading task called phonetic cue reading. In this task, she used her knowledge of phonemes associated with letters to select the correct word when given two choices of what that word might be. For instance, when she learned that the letter *s* said /s/, she was asked to use this knowledge to tell me if the printed word *SAT* was spoken word *fat* or *sat.*

This experience stirred my interest in pursuing a study to help young children develop PA. It also led me to consider how I might design an intervention program that might be useful to parents. Working with this child helped me pinpoint activities that engaged her interest despite a fleeting attention span, and through my work with her, I discovered what helped her better understand how our oral and written language are linked.

Rationale for the Study

A large body of evidence links phonological processing problems with word identification difficulties in at-risk children and children with learning disabilities in the early stages of reading (Adams & Bruck, 1993; Gough & Tunmer, 1986; Perfetti, 1985; Siegel, 1993; Stanovich, 1988, 2000; Torgesen, 2000; Vellutino, Fletcher, Snowling, & Scanlon, 2004; Vellutino & Scanlon, 1987). For this reason, PA is an important topic for researchers to continue

to clarify for both parents and educators. Children who are slow to develop PA are found to have persistent reading difficulties that are difficult to overcome (Vellutino et al., 2004).

Surprisingly, however, survey data of reading professionals indicates that many teachers no longer consider PA instruction a topic of interest (Cassidy, Ortlieb, & Shettel, 2011). The number of new studies of problems and issues in teaching PA have diminished, but many unanswered questions about PA remain. Because of its long-term effect upon reading achievement and the link that exists between phonological processing and reading disabilities, it is important that researchers continue to explore unanswered questions related to PA and reassert its importance as a critical prerequisite skill in beginning reading. Therefore, this dissertation study addressed some of these unanswered questions.

The Early Childhood Literacy subcommittee for the National Institute for Literacy (Abdullah-Welsh, John, & Bosma, 2009) analyzed results of 38 studies involving over 5000 children in an effort to identify areas in need of further research. As a result of the analysis, they have specifically called for studies that target children from birth to 3 years with more measures of early literacy to determine if earlier interventions can have a broader impact on literacy development. They also called for studies that include parents. This study combined the two by having parents provide the intervention to promote children's development of PA before formal literacy instruction began.

The NRP also reported that motivation of student and teacher has not been addressed in research on PA. The Panel pointed out the need for research that identifies teaching techniques and instructional components that are appropriate, relevant, and of interest to children as they develop PA. In my work with young children, I have found that language games, repetition, pictures, noises, gestures, and stories are interesting activities that motivate both learners and

teachers because they are often perceived as play. Therefore, I took this into consideration in designing the curriculum that parents used to teach their children PA. Qualitative data from this study were examined to assess parents' and children's engagement in the lessons and to propose questions for further research.

Purpose of the Study. This study was undertaken to look at the effectiveness of parents explicitly teaching preschool children to identify phonemes and locate them within words. Research indicates that parents are able to teach preschool children both letters and letter sounds (Sénéchal & LeFevre, 2002; Stephenson, Parrila, & Georgiou, 2008). The expansion of home schooling across the country also indicates that many parents are successfully guiding their children's learning. Parents are the primary educators of their preschool children. Given guidance and an explicit program of instruction, parents may be able to introduce their children to the alphabetic principle, i.e., the knowledge that letters of the alphabet in written language represent phonemes within spoken language.

Because PA has been identified as an essential prerequisite skill for learning to decode, children in at-risk child-care settings such as the government-funded program of Head Start may benefit from early intervention in PA. If parents can intervene to introduce their children to phonemes during book reading, it is possible that preschool teachers will also be able to deliver effective instruction to preschool children in their care. This study, therefore, was undertaken to provide information on how young children can acquire PA and the alphabetic principle through informal instruction during story time before they enter primary school.

Uniqueness of the Study. There were several features of this study that made it unique. The study addressed some gaps in the research literature on parent involvement in developing PA with young children, and parents providing phoneme identity training to help children

understand the alphabetic principle. The study was also unique because it made use of shared reading time in the teaching of phoneme awareness. Teaching PA during shared reading was a component of a study with kindergarten children (Ukrainetz, Cooney, Dyer, Kysar, & Harris, 2000), however, it had not been the subject of an experimental study conducted in the home setting prior to this study. Typically, print concepts are best learned during shared reading, while phonemes are taught with oral activities apart from the authentic practice of shared reading. In this study, however, parents in the experimental group taught children PA during shared reading, while parents in the control group taught the more typical preschool curriculum of print concepts during shared reading.

Theoretical Foundations

PA is a reliable, predictive factor in assessing whether children will have difficulty learning to read. According to the report of the NRP (NICHHD, 2000) phoneme awareness and letter recognition are the best predictors of reading achievement. These findings continue to be supported by research (Anthony, Williams, McDonald, & Francis, 2007; Fraser, Goswami, & Conti-Ramsden, 2010). PA, however, is not easily acquired by pre-literate children (Carroll, Snowling, Hulme, & Stevenson, 2003; Hesketh, Dima, & Nelson, 2007). Adam's (1990) theoretical model of levels of phonological awareness suggests that children learn about phonemes as the final step in developing phonological awareness, the broader category of oral language awareness that includes larger levels of speech, i.e., sentences, words, syllables, and onset-rime units. Adam's argument is based on the premise that the concept of phoneme is more easily acquired after children grow in sensitivity to larger language units, because isolated phonemes are not obvious in spoken language. Additionally, phonemes lack meaningful connections to concrete objects making them difficult to remember. A contrary hypothesis,

however, is that children may acquire the alphabetic principle before they learn about larger phonological structures just as they learn about letters before learning larger structures of print. Print concepts such as the knowledge that sentences make a message, words have spaces between them, and letters are what we use to make words, may be incidental knowledge children acquire when learning about letters. There is no conclusive evidence of a continuum or sequence for learning about phonological structures (Carroll, et al., 2003). We only know that children who are aware of phonemes in spoken words respond more readily to reading instruction.

In teaching phoneme identities coupled with letter recognition, parents and teachers may promote the development of PA and help children make the difficult cognitive switch from meaning processing to auditory processing. The outcome of this study, therefore, may provide evidence that requires researchers to consider the efficacy of a *phoneme first* instructional model rather than rely on the theoretical assumption that children acquire PA through gradual growth in sensitivity to phonemes.

Another important theoretical consideration is how cognitive links are built. Because phonemes are meaningless without letters, and letters are meaningless symbols without an understanding of the alphabetic principle, children need assistance in remembering both the symbols and their corresponding phonemes. For young children, abstract ideas are concretized through paired associations with more familiar concrete ideas. Associations with only phonemes and graphemes have yielded positive effects upon elementary school-age student recall (Adams, 1990; Bond & Dykstra, 1967; Muter et al., 1997; Windfur & Snowling, 2001), but young children need multiple, meaningful cognitive links to make retrieval of abstract knowledge easier (Ainsworth, 2006). The more information a child has to connect with a new idea, the easier it will be to retrieve that concept. This phenomenon is explained in *Spreading Activation Theory*

(Stanovich, Nathan, West, & Yala-Rossi, 1985). According to this theory, all information related to a concept is stored in the lexicon. When one portion of a schema is activated, other cognitive links are involuntarily activated. This theory explains why there are so many random associations to sort through when we hear a familiar word or sound. Spreading activation theory may also explain how children build automatic access to abstract ideas like phonemes and letters. By increasing the cognitive links during instruction, automatic access to phonemes may be made easier and contribute to effortless recall.

Design of the Study

This study compared the reading performance of two groups of preschool children in two different treatment conditions. One condition served as a treated control group (N=17), focusing on teaching concepts about print (CAP) such as sentence, word, and letter. These are the components of the traditional curricula for many early childhood instructional programs. The experimental condition focused on teaching PA (N=17), specifically the identity of eight phonemes, to see if this brief amount of instruction would help children begin to use letters of the alphabet to identify words.

Pretest data were analyzed with Independent Samples *t* Tests to see if there were significant differences between experimental and control groups prior to instruction. If differences were found among pretest scores, pretests would be used as covariates to control variance between groups. Afterwards, data were analyzed with separate one-way analysis of covariance (ANCOVA) tests to examine effects of the independent variables, intervention group, age group, and instructional time, on three dependent variables of interest: the Test of Phoneme Identities ® (TPI), phonetic cue reading (PCR), and the CAP test.

Research Questions and Hypotheses

In the following sections, groups are designated as PA for the experimental group where phoneme identities were taught and CAP as the control group, where concepts about print were taught. PA performance refers to scores on the Test of Phoneme Identities © (TPI) and phonetic cue reading (PCR), while CAP performance refers to scores on the Concepts About Print (CAP) measure.

Questions. This study focuses on the following research questions:

1) To what extent do preschool children in the PA treatment demonstrate knowledge of phoneme identities on the TPI compared to children in the CAP treatment?
2) To what extent do preschool children in the PA treatment apply letter-sound knowledge to identify words in PCR compared to children in the CAP treatment?
3) To what extent do preschool children in the CAP treatment demonstrate gains on the CAP test compared to children in the PA treatment?
4) To what extent do children differ in PA or CAP performance as a function of age?
5) To what extent do children differ in PA or CAP performance as a function of time spent on instruction?

Hypotheses. The following null hypotheses were tested.

1) (H_1) Preschool children who learn phoneme identities will demonstrate PA through the TPI to a greater extent than preschool children who learn print concepts. (H_{01}): There are no statistically significant differences between TPI scores for preschool children in the PA group compared to preschool children in the CAP group.
2) (H_2): Preschool children who learn phoneme identities will use letter-sound knowledge to identify words in phonetic cue reading to a greater extent than children

who learn print concepts. (H_{02}): There are no statistically significant differences in PCR scores in the PA group compared to PCR scores in the CAP group.

3) (H_3): Preschool children who learn print concepts will make greater gains on the CAP test compared to CAP scores in the PA group. (H_{03}): There are no statistically significant differences between CAP scores for preschool children in the CAP group compared to preschool children in the PA group.

4) (H_4): Children will differ in PA or CAP performance as a function of age. (H_{04}): There are no statistically significant differences on TPI, PCR, or CAP measures as a function of age.

5) (H_5): Children will differ in PA or CAP performance as a function of instructional time. (H_{05}): There are no statistically significant differences on TPI, PCR, or CAP measures as a function of instructional time.

Limitations and Assumptions

Limitations. Due to the age of participants who were very young preschool children, the measures used for data collection may not have been reliable indicators of children's early literacy skills. Short attention spans and distractibility were common obstacles during assessments that may have affected scores. Because participation was voluntary and most parents used their best judgment in how to teach their children rather than follow a strict protocol, there was no guarantee that treatments were identical. Materials, scripts, and instruction to parents in each group were the same, but how parents went about teaching children could not be regulated. Additionally, children who participated in the study were a diverse group ranging in age from three to five. Therefore, levels of prior knowledge and literacy experiences may have had an impact upon interventions and outcomes.

Assumptions. The assumption could be made that parents, as voluntary participants, were interested in their children's literacy since they agreed to take time out of their busy schedules to read regularly to their children and to also teach them new concepts. This was all agreed to without any expectation of compensation other than learning to use ordinary read-aloud time to teach children new vocabulary and new concepts. Due to recruitment procedures, participants represented a normal range of regional middle class families. All participants had children enrolled in a childcare facility or they attended weekly literacy events offered by the public library. Most parents indicated that they were employed, and all parents who completed the study demonstrated that they were both educated and highly motivated to involve their children in a variety of literacy experiences. Children demonstrated normal intelligence during assessments and understood how to respond to questions. Children were non-readers, able to demonstrate some basic literacy skills, and parents reported no impairments. Children who were second language learners spoke fluently in both English and their native languages as did parents volunteering to be part of the study. Because participants were limited to middle class families, the assumption can be made that it was not representative of the broader population of the area that includes individuals and families in higher and lower socio-economic classes.

Summary

Many children enter school without prerequisite skills for reading. They often lack knowledge of the alphabetic principle, which may delay reading acquisition. An overwhelming body of evidence shows that PA and letter recognition are predictors of skilled reading. This study examined the effectiveness of parents teaching phoneme identities to young preschool children by measuring literacy task performance before and after the instructional intervention. The purpose of this study was to see if teaching phoneme identity is adequate for developing PA

and if children would show evidence of acquiring the alphabetic principle after the intervention period by using their knowledge of the alphabet in a forced choice reading task. The control group learned print concepts and completed the same literacy tests as the experimental group to see if instructional conversations about print while reading had any effect on literacy measures.

Definitions of Key Terms

Alphabetic principle. This refers to the understanding or insight that words are composed of letters and letters represent discrete vocalizations of language.

Alliteration. Use of words with a repetitive consonant sound, as in tongue twisters, e.g., Silly Sarah sat in silence.

At-risk children. Children with limited access to literacy experiences in the home environment or day care setting due to demographic factors often associated with illiteracy, such as poverty.

Booktalk. A booktalk is an introduction to a story featuring two key elements. The reader is introduced to a character in an ordinary situation and the first problem the character faces; but the resolution is withheld in order to arouse curiosity and interest.

Coarticulation. This refers to a property of words, where phonemes blend smoothly together so that they are not easily identified in speech. Coarticulation makes blends hard to separate and it may sound like a distorted version of the phonemes when they are isolated, e.g., *train* may sound like *chrain* when coarticulated, while /t//r//A//n/ may be hard to blend to form the word *train.*

Concepts about print. This refers to a basic understanding of the vocabulary and functions of print. For example, does the child understand print directions: top of the page,

bottom of the page, where to go after finishing the last word of a line of text, reading left to right; print vocabulary: word, letter, page, title, sentence; and whether print or pictures tell the story.

DIBELS. The Dynamic Indicators of Basic Early Literacy Skills is a set of standardized tests that measure primary student's growth in letter knowledge, word reading, oral word fluency, phoneme awareness, and reading comprehension.

Emergent readers. Children who know little about reading are referred to as emergent readers. Emergent readers are often in what Ehri (1999) describes as the pre-alphabetic phase of word learning.

Instructional conversation. The use of natural dialogue to teach, share knowledge, and question the learner by means of interpersonal communication.

Lexical representations. This is a mental reference of meaningful concepts stored in memory units, such as a word or a phoneme. It includes all prior knowledge and experience with the concepts including words, sounds, and images.

Mental lexicon. See lexical representations.

Metalinguistic shift. Becoming conscious of the features of language production, specifically the sound structure of words, rather than focusing solely on word meaning.

Nonsense words. See pseudowords.

Oddity task. A phonemic awareness assessment that requires a child to make a decision about which word has a different beginning, middle, or ending phoneme in a set of 3-4 words.

Onset. The onset is a consonant or consonant blend preceding the vowel in a word. The onset in the word *speech* is *sp.* Words beginning with a vowel do not have an onset, such as *eat, aim,* or *old.*

Orthographic knowledge. This is knowledge of common rules for combining letters into words or more simply, spelling knowledge.

Orthographic representations. The common spelling patterns of written language. In alphabetic languages, it refers to the graphemic representation of phonemes, e.g. *ai* = /A/.

Partial alphabetic. This refers to Ehri's (1999) second phase of literacy development when students use boundary letters in words such as the first or last letter rather than the complete spelling in identifying printed words.

Phoneme. A linguistic term for the discrete, smallest vocal unit of language, articulated within words. Words are typically comprised of multiple phonemes. They are often referred to as sounds within words, but linguists refer to them as vocal gestures (Liberman & Liberman, 1992).

Phoneme awareness. This is a subcategory of phonological awareness that includes knowledge of phoneme identities and the ability to manipulate phonemes through isolation, segmentation, blending, addition, and deletion tasks.

Phoneme blending requires listening to a sequence of separated sounds and combing them to form a word, e.g., "What word do you think this is /k/ /a/ /t/?" (cat)

Phoneme categorization requires identifying a word in a sequence of three or four words without a similar sound, e.g., "Which one of these words doesn't belong with the others, *bag, bike, rat*?" (rat)

Phoneme deletion recognizes a new word when one phoneme is removed, e.g., "What is stop without the /s/?" (top)

Phoneme elision. See phoneme deletion.

Phoneme identity refers to the discrete sound produced with a vocal mouth gesture for each phoneme, e.g., the phoneme /b/ is a voiced labial gesture articulated at the beginning of the

word *big*. Performing the phoneme identity task requires recognition of a common sound in different words, e.g., "What sound is the same in these words: *bear, box, bug*?" (/b/). Another phoneme identity task would ask a student to select a word that contains a target phoneme: "Do you hear /b/ in *big* or *dig*?

Phoneme isolation recognizes an individual phoneme in words, e.g., "What is the first sound in man?" (/m/).

Phoneme segmentation requires breaking a word into individual, separated phonemes by articulating them one-by-one, moving a marker for each phoneme, or tapping once for each phoneme, e.g., "What sounds do you hear in *pot*? (/p//o//t/)" or "Tap the sounds in pot: Tap-tap-tap."

Phoneme-grapheme relationships refers to the pairing of the smallest unit of vocal gestures within words and their graphemic representations, i.e., the letter or letters that are commonly used to map a word's pronunciation.

Phoneme manipulation This refers to the ability to alter phonemes in a word by adding, removing or otherwise altering the position of the phoneme. For example, a child who is instructed, "Say *stop* without the /s/," responds with "top."

Phonetic cue reading refers to an emergent reading task that helps identify children who use some alphabet knowledge to identify words. A printed word is presented and the child is told to use the letters to decide what the word is. It is a discrimination task limited to two choices. For example, the word card shows *MAN*, and the child is asked, "Is this *man* or *fan*?" A score of 9/12, considered greater than chance, identifies partial alphabetic readers from pre-alphabetic readers.

Phonological awareness. Understanding that speech units can be broken down from meaningful sentences to words, to word parts such as syllables, onsets, or rimes, and that word parts are composed of individual phonemes.

Phonological Recoding. This is using knowledge of the relationship between letters and phonemes to retrieve the pronunciation of an unknown string of print, turning the printed map of a pronunciation into a meaningful spoken word.

Phonological sensitivity. The ability to detect different levels of speech from the whole word, then word parts, and finally the phoneme level of speech sounds.

Pre-alphabetic. This refers to Ehri's (1999) earliest phase of reading development when children use environmental cues, word shapes, context, and images to identify words instead of the alphabet.

Pre-literate. This refers to the period before conventional literacy skills develop. Children may be aware of some literacy concepts and demonstrate emergent literacy; however, they are unable to read or write in a formal sense. See *emergent readers.*

Preprimer. This term refers to the reading level that children acquire by the end of kindergarten or the beginning of first grade. It consists of high frequency words found in beginning level texts.

Pseudoword. Refers to words constructed using legal spelling patterns found in analogous real words, such as *lat* or *fim.* Pseudoword identification is evidence of decoding ability.

Rime. The rime is a word segment or syllable that includes the vowel and consonants following the vowel. The rime in the word *speech,* for example, is *eech.*

Rhymes. Words that share the same phonetic ending, e.g., *take, make, break*.

Scientifically Based Reading Research (SBRR). This refers to experimental and quasi-experimental studies that have been published for peer-review. Such studies must conform to standards of design and analysis (Campbell & Stanley, 1966) and use a population sample that represents a larger group.

Vocal gestures are the movements of the mouth, lips, larynx, and tongue to produce discrete phonemes.

CHAPTER II

REVIEW OF THE LITERATURE

Phoneme Awareness in school-aged children is an area that has received much attention from the research community; however, there is little if any research that examines training preschool children to develop PA skills with parents as instructors. This chapter examines studies involving young children and parent intervention in literacy skills development including phoneme awareness studies and a brief overview of studies related to teaching print concepts. It also examines theory that may account for how PA develops and types of PA instruction that may contribute to reading acquisition. In addition, it looks at studies that report the efficacy of parent involvement in beginning literacy.

Theoretical Perspectives

The Phonological Sensitivity Model

How do children develop phoneme awareness? The phonological sensitivity model is based on the assumption that children begin to develop phonological awareness incrementally. Current theory, based predominantly on correlational studies (Lundberg, Olofsson, & Wall, 1980; Muter, Hulme, Snowling, & Taylor, 1997; Stanovich, Cunningham, & Cramer, 1984; Yopp, 1988), suggests that children learn PA as the last step in developing phonological awareness, i.e., the sensitivity to all levels of oral language, beginning with word as a structured unit of speech to the more abstract subword structures of syllable, rime, and onset. The most elusive structure, the phoneme, is difficult to detect, and sensitivity to larger units may make it easier to become aware of the smallest unit.

Most PA tasks do not measure children's knowledge of individual phonemes but their ability to manipulate phonemes in segmentation, blending, addition, or deletion tasks. Therefore, PA assessments may be highly dependent on manipulation skills rather than simple identification of phonemes to differentiate one phoneme from another. Since phonemes do not have meaning and vary in pronunciation from one dialect to another, it does not seem reasonable that children would naturally grow sensitive to meaningless sounds that are difficult to even detect. Individual phonemes are often coarticulated with other phonemes and may sound different in isolation in contrast to their articulation within a word, depending on the phoneme's location within the word. For instance, /p/ is more easily detected in *pig* at the beginning of the word than in *step* at the end of the word. The /p/ in the beginning location blends effortlessly with /i/ and is articulated more audibly than it is in the final position in *step*, where it is perceived more as a movement of the lips than an audible sound.

While theory is often formed from a body of data, sometimes theory contains elements that are untested or not supported by empirical evidence. Despite an abundance of research on beginning reading, there are still some theoretical assumptions made that lack supporting evidence about how children acquire reading skills. We have conclusive evidence that children need one feature of print concepts, letter recognition, in order to learn to read. On the other hand, we do not know which phonological awareness skills best help children become skillful readers. Correlational studies suggest that phonological sensitivity does not often develop naturally (Stephenson, Parrila, & Georgiou, 2008), but that it can be taught explicitly.

Anthony and colleagues (2003) wondered if there was a specific order in the development of phonological sensitivity (PS) in preschool and kindergarten children. Their study examined PS on four levels in 947 preschoolers, aged 2-5, focusing on the order of acquisition of

PA skills. PS levels were assessed by order of linguistic complexity: words, syllables, onsets, rimes, and phonemes. Tasks ranged in complexity; for instance, with blending, children were asked to blend single syllable words into compound words and blend onsets with rimes before being asked to blend phonemes into words. Elision tasks started with deleting single syllable words from a compound word and ended with deleting a phoneme within a word. Data analysis provided evidence of a somewhat parallel progression i.e., some skills were acquired simultaneously, such as blending onset-rime pairs and blending phonemes. Also, there appeared to be consistent patterns in the order of skills learned, but there were no discernable stages of development. The study conducted by Anthony's team found evidence to suggest that children's sensitivity to higher phonological structures preceded that of lower structures, however, preschool-age children showed sensitivities to all levels of phonology, which diminishes support for a theoretical model based on developmental stages. They concluded that despite notable patterns indicating phases, phonological awareness development did not follow a strict, sequential hierarchy (Anthony, Lonigan, Driscoll, Phillips, Burgess, 2003).

In another study (Carroll et al., 2003) 67 three and four-year-old children were tested three times within a year on a range of phonological awareness tasks: rime awareness, syllable awareness, and initial phoneme awareness. Forced-choice tasks measuring syllable, rime, and initial phoneme awareness were used to determine whether children grew in sensitivity to larger phonological units before developing phoneme awareness. They predicted that the syllable matching task would be easiest for children while rime and initial phoneme tasks would be equally difficult, because they both require sensitivity to the onset–rime units, a more complex level of phonological awareness. Results, however, showed insignificant differences in levels of performance between syllable and rime awareness tasks. Like the Anthony et al. study,

this one looked for correlations and neither investigated the role of intervention. Yet results such as these are used as indicators of children's natural development in increasing levels of phonological sensitivity. While phonemes are not as salient as syllables or rimes, there is not sufficient evidence to conclude that children cannot be taught to identify phonemes before developing a sensitivity to more salient structures. What we can conclude from these studies is that ordinary literacy activities help children grow in their awareness of larger structures, but PA requires a more direct instructional approach.

In a 1990 study of an intervention that explicitly taught only nine phonemes, Byrne and Fielding-Barnsley found that phoneme identities were something preschool children were able to learn. Children subsequently transferred their knowledge of how to detect the nine taught phonemes to detection of untaught phonemes, indicating an awareness or sensitivity to phonemes without prior instruction. Their new knowledge, however, was insufficient to demonstrate knowledge of the alphabetic principle because they could not successfully apply it in a word identification task. Cunningham (1990), however, provided some insight into this gap. In her study, one group of preschool children learned two PA tasks, segmenting and blending using a drill-practice method following teacher modeling. The other group learned these same skills but were given further instruction to learn how to apply their knowledge of phonemes in a reading task. Additionally, children in the application group were provided with a relevant rationale for learning segmenting and blending prior to application, i.e., it is useful for reading words. The application group's results demonstrated a large effect size on the word reading task far above that of the other groups, suggesting that further instruction was necessary for children in these groups to make the metalinguistic shift from focusing on word meaning to sound structure in order to apply phoneme knowledge in a meaningful reading task. Cunningham's evidence is

compelling, but it does not answer the question: Is it necessary to teach children to be sensitive to the larger structures of language when phonemes have been shown to be the critical factor needed for reading?

There is evidence that preschool children can learn phoneme identities through instruction that guides them to understand the purpose of phonemes in the reading process. There is little evidence, however, that children need to develop phonological sensitivity at levels greater than phonemes in order to learn to read. Evidence from the studies of phonological sensitivity and PA reviewed in this section suggest that a phoneme-first theoretical model may better explain the phenomenon of how children come to understand the alphabetic principle than the more widely accepted phoneme-last theory.

Dual Coding and Spreading Activation Theory

Dual Coding Theory is a general cognitive theory that has been applied to reading. Sadoski and Paivio (2007) found that this theory accounted for all aspects of reading from decoding to reader response, because it suggests that reading involves the interaction of two codes: verbal and non-verbal imagery. The verbal code associates print with pronunciations, linking the pronunciation to a network of both known and unknown verbal representations, i.e., vocabulary. Verbal representations evoke nonverbal mental images that may or may not be relevant, but contribute to the reader's understanding of print. While all speech does not evoke imagery, speech within a context often connects with some aspect of non-verbal imagery. It is the reader's way of connecting print with background knowledge, whether or not it is accurate. The method of teaching phonemes in this study paired visual representations of sounds in the real world with phonemes represented as graphemes embedded in the phoneme analogy. This allowed children to have a mental image of an abstract and otherwise meaningless structure, i.e.,

letters, and it paired real world sounds with phoneme-grapheme pairs, giving them both meaning. For example, the letter *a* stands for the phoneme /a/ and the phoneme analogy for /a/ is the sound a crying baby makes (see Figure 1).

Figure 1. Phoneme Analogy Card for /a/

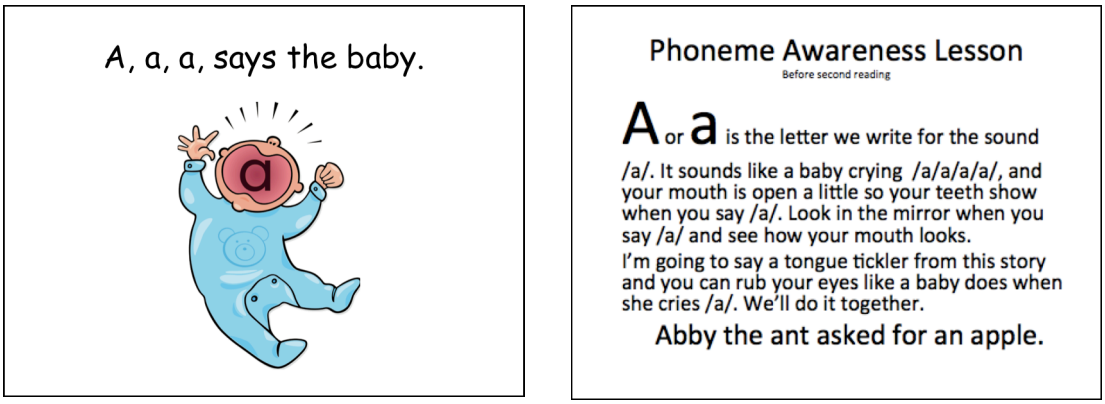

Figure 1. A phoneme analogy card for each book was used to help children associate an image with a phoneme. The letter was embedded in the image as the visible print symbol of the phoneme. To the right of is a sample script accompanying the card used by parents to teach the features of the phoneme and provide practice finding the phoneme in words.
Photo credit: Copyright 2010, *The Reading Genie.*

A recent study by Shmidman and Ehri (2010) illustrates the phenomenon of dual coding theory. The study was done primarily to facilitate the learning of foreign alphabets, but it has implications for teaching preschool children letter-sound correspondences. It also supports past research findings that demonstrate the effectiveness of using images and symbols to help build phoneme-grapheme associations (Ehri, Duffner, & Wilce, 1984; Marsh & Desberg, 1978).

Shmidman and Ehri tested the effectiveness of embedding letters within images that resembled the shapes of selected Hebrew letters to teach phoneme-grapheme associations. The image names began with the same English phoneme as the phoneme associated with each Hebrew letter. For instance, the ל (lamed) was embedded in the picture of a lizard to teach the

shape and the phoneme /l/. Children learned another set of letters as a counterbalance condition with similar images and the letter written above the images, rather than embedded. Children learned the letter-sound relationships as well as segmentation of initial phonemes. At the end of the intervention, children were tested on their ability to identify the phonemes associated with each Hebrew letter without the images. Results indicated preschoolers were better able to identify phonemes associated with Hebrew letters that were learned in the embedded mnemonic condition. Additionally, they less frequently confused letters in the embedded condition. Also, after a week had passed, children remembered the phonemes of letters in the embedded condition better than letters without embedded images. Especially noted were transfer effects to reading and spelling for the embedded condition. This suggested that embedded mnemonics, that is, non-verbal representations paired with phonology helped children form a strong cognitive link to better pair an unfamiliar letter and its corresponding phoneme. The resulting knowledge also directly aided children in word learning.

Bergeron and colleagues (Bergeron, Lederberg, Easterbrooks, Miller, & Connor, 2009) found similar results when they used images to help children who were deaf develop phoneme awareness. They used the dual coding model to explain how children with severe hearing impairment were able to develop phoneme awareness, describing graphic images as *imagens*:

> The mental model the child develops will be a combination of phoneme, imagen, and grapheme. Some children will take longer than others to link graphemes to phonemes. Some will quickly grasp the link between grapheme and phoneme and will drop the imagen earlier than others. Still others will need the "glue" for a longer period before associations between graphemes and phonemes become automatic. (p. 91)

Spreading Activation Theory (Anderson, 1983) also seems to be at work in building the cognitive foundations of reading. This theory explains how we retrieve information from memory. It posits that semantic information is stored in cognitive units in long-term memory. These units are associated with other semantic units that form a retrieval network within the lexicon. Activated associations are automatic and require conscious mental effort to select the information that we need to make sense of the original stimulus. When one unit is activated, the neural paths cause the activation of other units. If we provide children with a number of cognitive associations to build their understanding of a new concept such as the letter *f,* we can rely on spreading activation to help them retrieve the needed information to use in identifying words. If we tell the child that an angry cat says /f/ and shows its sharp claw that looks like the letter *f,* the child has three associations with the phoneme: an analogous image, the sound of the phoneme, and the grapheme *f*. If we ask the child to show her sharp claw like a mad kitty when she hears /f/ in a word, she now has four associations including the gesture. Practicing these together in the context of an engaging story may build strong, memorable connections between the phoneme and its grapheme. The child is more likely to remember the correspondence when it is not based on simple paired association of two abstract concepts, grapheme and phoneme, but through a merged network of four memorable associations: an auditory link, two visual links, and a kinesthetic gesture.

While there are numerous studies that demonstrate spreading activation at work in reading comprehension, there are no studies that explain the retrieval process that children use to connect phonemes with letters. But letters are visible symbols for phonemes and phonemes allow letters to take on meaning (Adams, 1990). Therefore, it may be the case that memorable

experiences, symbols, and images used together help create a meaningful and easily accessed cognitive network that helps children automatically identify phonemes associated with print.

Research on Phoneme Awareness and Phoneme Awareness Instruction

Findings of the National Reading Panel

Many of the findings of the NRP (NICHHD, 2000) pertain to children who were in the beginning stages of reading in first grade; however, the panel also looked at the effects of PA instruction on reading acquisition for preschool children. Their consistent finding, in reviewing experimental and quasi-experimental studies involving PA interventions, was that there were greater effect sizes with preschool children (Pre-K through kindergarten) than there were for groups of older readers with learning disabilities and first grade children. The effects were large on follow-up tests, on measures of the ability to read words and pseudowords, and on reading comprehension measures. Both standardized tests and experimenter tests showed statistically significant differences from pre-treatment to post-treatment, and the ability to manipulate phonemes had an effect on reading under all conditions.

Based on reviewed studies, the NRP concluded that PA should be explicitly taught and that it is effective in helping children learn to read in a variety of teaching conditions with diverse learners. It helps children across all socioeconomic status (SES) levels learn to read words and pseudowords; it boosts reading comprehension; and it helps all types of children improve in reading, including normally developing, at-risk, English language learners and disabled readers. It also assisted children in learning to spell in grades K-1, but it did not have an effect on spelling outcomes of older disabled readers. Also, the condition of teaching phoneme manipulation using letters had a greater effect upon learning outcomes than did phoneme

manipulations without letters (Ball & Blachman, 1991; Blachman, et al., 1994; Tangel & Blachman, 1992).

The NRP report also stated that PA instruction "needs to be relevant, engaging, interesting, and motivating in order to promote optimal learning in children" (NICHHD, 2000, p. 2-43). The Panel noted that there is a gap in the research literature on how to motivate children to engage in PA activities and they also concluded that children are more likely to develop PA through explicit instruction. This study examines qualitative results related to children and parent motivation, however, qualitative data could not be used in a statistical analysis due to its descriptive nature.

Because the NRP findings provide evidence that PA is a means to reading acquisition and not an end in itself, letters should be included in PA instruction since the primary purpose of PA instruction is to help children make the metalinguistic shift needed to acquire the alphabetic principle. It is this principle that helps children understand the reading process. Also, benefits were always found to be greatest for non-readers. While children differ in PA, and some need more instruction, 20 hours or less proved to be the more effective than lengthier training periods.

PA training is not a complete reading program, but it is an important component of an effective program. It does not guarantee that children will learn to read and write, but it was strongly correlated with reading success. The NRP could not infer that every teacher successfully taught PA and every student experienced success acquiring PA. Additionally, not all children transferred PA to reading and writing due to significant variation within and across multiple studies.

Recommendations of Early Childhood Literacy Research

After extensive screening of preschool populations, the National Institute for Literacy (2009) identified the following areas for further research. Children from birth to 3-years needed to be targeted for measures of early literacy to determine whether early interventions might have an impact on literacy outcomes. The Institute called for studies that included parents in interventions aimed at improving children's print awareness, name writing, and language development beyond vocabulary. Institute authors also contended that research involving young children often suffered from design weaknesses, e.g., studies lacked comparison groups with random assignment, adequate sample sizes, details for replication and analysis, and appropriate statistical analysis. In addition, the committee called for research that addressed the following domains of literacy skills: alphabet knowledge and fluency with letter names, phonological awareness, rapid naming of pictures/objects, name writing, and other writing.

Phoneme Awareness and the Alphabetic Principle

What is the link between PA and the alphabetic principle? PA is the ability to identify and manipulate phonemes in spoken words, i.e., the small distinctive vocal gestures embedded within words (Liberman & Liberman, 1992) such as the /w/ in *word*. A child with PA can decide whether *stop* and *shop* have the same or different beginning and ending phonemes in a listening task without looking at the words or attending to their spellings. The alphabetic principle, on the other hand, is an understanding that letters represent pronunciations. When emergent readers who do not use any part of the alphabet become aware of phonemes and their connection to letters, they advance into a new phase of reading, the partial alphabetic phase, where they begin to use some letter knowledge to identify words (Ehri, 1999). Byrne and Fielding-Barnsley (1990) provided evidence that children can acquire this insight, in a study they conducted to investigate several aspects of phoneme awareness, including how it could be effectively taught and whether

knowledge of taught phonemes would aid in identifying untaught phonemes. Preschoolers were first taught to identity four phonemes in beginning and ending positions in words. Then they were tested on their ability to identify which word in a pair contained the target phoneme. Afterward, children were introduced to new letters without receiving corresponding phoneme identity training. Results showed high correlations among eight identity tasks indicating that children who demonstrated mastery of phoneme identity for a single letter made use of this knowledge to identify other untaught phonemes. While the number of participants in the study was small (N=16), evidence was strong that young children can acquire the alphabetic principle with minimal instruction. In addition, they conducted a follow-up study three years later and found that children in the experimental group from the original study were superior in reading pseudowords in the first and second grade, which indicated they had developed greater decoding skills than children in the control group. The experimental group also demonstrated superiority in reading comprehension over the control group.

Treiman and colleagues (1996) proposed that children first connect print and speech by noticing the links between letters in print and letter names in speech; for example, in the word *deep* we hear the letter name *d.* Citing an earlier work of Ferreiro and Teberosky (1982), they made a case for teaching letter names to children because preschool-aged subjects used this knowledge to connect print with speech. Results from their study, however, showed the limitations of just teaching letter names. Children did better when the letter name was salient in the word, such as *beach* that begins with /bE/ rather than *bone* that begins with /bO/. They also did better recognizing words that had the letter name in the beginning of the word rather than at the end. For instance, it was harder to notice the letter name *eff* in *deaf.* Also, children produced more errors when deciding the first letter in wrong letter name words than in other word types,

suggesting the letter name influenced task performance, e.g., *wife* sounds like it contains the name of the letter *y* /wI/ with no hint of the name *double-u* for *w*. Also, children could name visually presented letters, but they could not identify spoken words containing those letters. This study demonstrated that children do not consistently transfer letter-name knowledge to corresponding phoneme knowledge, suggesting that the alphabetic principle is not acquired by just teaching letter names.

Methods of Instruction

Before going into the methods of instruction, it is important to make the distinction between phonological awareness and phoneme awareness since the two topics are often discussed among researchers. Phonological awareness is an umbrella term that refers to knowledge of all structures of oral language from the least to the greatest, from phonemes to sentences, while phoneme or phonemic awareness refers to the smaller structures of oral language within the phonological domain, e.g., syllables and phonemes.

The NRP highlighted a number of key factors for teaching PA that had an impact on learning to read.

> PA training is more effective when it is taught by having children manipulate letters than when manipulation is limited to speech . . . teaching one or two PA skills . . . resulted in larger effect sizes on reading than teaching a multitude of PA skills. Small groups . . . produced superior transfer to reading than individual instruction. Lengthy training periods . . . yielded smaller effects on reading than shorter training periods. (NICHHD, 2000, p. 2-26)

The Panel also noted that blending and segmentation had a significantly larger effect on reading than multiple skill instruction, but they did not suggest that any particular PA skill could

be more beneficial for initiating the alphabetic principle than other PA skills. The Panel indicated that children with PA generally outperformed children who did not have PA, even in the area of comprehension five years following PA intervention, but they could not guarantee that children who developed phoneme awareness would learn to read. PA however, did appear to help children make sense of phonics instruction, because with PA, they were able to understand the idea that letters represent phonemes in spoken words. The Panel concluded that further research was needed to identify effective methods of instruction that were relevant and engaged both teachers and learners.

The typical approach in teaching children to think about language sounds rather than language meaning is to help them identify larger vocal units before smaller ones in keeping with the phonological sensitivity model. However, a number of children simply acquire PA without any direct instruction or intervention as the NRP stated in their review of the literature, "Because our language is alphabetic, children acquire some phonemic awareness in the course of learning to read even if it has not been taught directly" (NICHHD, 2000, p. 2-43). While this may be the case for children in literacy rich homes who receive informal reading instruction on a daily basis, the NRP concluded that explicit instruction was necessary for many children and that most derived some benefits from the direct approach. There are a variety of ways to teach PA, but not all have the same effect upon reading acquisition. Some may even require orthographic knowledge for children to successfully complete them. The following studies examined typical PA instruction in the classroom and presented evidence for their effectiveness as well as caveats against their usage.

Syllable awareness. Syllables are salient features within words due to the presence of the vowel. Syllables have more noticeable boundaries in speech than do words that become more

distinguishable to children when they learn to identify word boundaries in print as spaces between strings of letters. Do children need to be able to identify this larger phonological chunk in order to become sensitized to phonemes? Syllable awareness is not as heavily researched as phoneme awareness, but there is conclusive evidence that children acquire sensitivity to syllables more easily than sensitivity to phonemes, which are often lost in the coarticulated, rapid speech stream of phonemes in spoken words. Mesmer and Lake (2010) conducted a study to examine the effects of syllable awareness training on finger-point reading using big books with predictable text during group shared reading activities. Children in the treatment group were taught to clap and blend syllables during a two to three minute routine before the teacher read the text aloud to them. Although children did not read but recited the predictable text following finger-point modeling by the teacher, the syllable awareness task aided preschool children as they finger-pointed words in the big books more than those who relied on just letter knowledge or the initial sound signaled by the first letter of the word. This study did not consider the impact of syllable awareness on phoneme awareness or the relationship of syllable awareness to reading. Letter naming ability did appear to contribute to the success of finger-point reading, suggesting that children attend to phonemes derived from letter names while trying to make a connection between spoken words and word boundaries in print.

Ferreiro and Teberosky (1982) hypothesized that children develop the alphabetic principle at the level of syllables before learning the connections between speech and print at the phoneme level. Their evidence came from case studies of young Argentinean children. From their observations of children inventing letterforms to represent syllables, they concluded that syllable awareness preceded PA. Although we know the syllable's importance in spelling and in reading polysyllabic words, there is no substantial evidence that phonological structures are

learned in a particular order (Anthony, et. al., 2003). Due to the fact that Ferreiro and Teberosky relied on case study observations and did not conduct experimental research, their results raise questions for further research that would examine the role of instruction and intervention in the development of PA and its relationship to phonological sensitivity.

Carroll and colleagues (2003) used data collected at three different time intervals to see if there was a natural progression in phonological awareness. They examined 67 three and four-year-old children's performance on syllable tasks, onset and rime tasks, and phoneme tasks. While there did appear to be greater gains on the syllable tasks and letter naming at later time periods, there was no evaluation of what children were learning in their homes and preschools, and the researchers did not provide any intervention. We may draw the conclusion that children were learning about syllables and letter names, but no evidence suggests that children did better on PA tasks if they had prior knowledge of syllables.

Rhyme and Nursery Rhymes. Tasks that require students to manipulate language units larger than phonemes are easier for beginners than tasks requiring phoneme manipulation (Liberman, Shankweiler, Fischer, & Carter, 1974). An example of this is nursery rhymes that use both rhyme and alliteration. Maclean, Bryant, and Bradley (1987) found early knowledge of nursery rhymes was strongly and specifically related to development of phonological skills. In 1990, Bryant et al. also found a significant relationship between knowledge of nursery rhymes at age 3 and success in reading and spelling at ages 5 and 6.

While these studies identifying nursery rhyme knowledge had some predictive validity for reading success, they did not indicate that this knowledge was necessary in order for children to identify phonemes. Martin and Byrne (2002) sought to determine the relationship between sensitivity to rhyme and phonemic awareness. Children in the experimental group received

rhyme instruction and children in the control group colored with researchers. Immediately following rhyme instruction children were administered a criterion test and received feedback and further instruction until they demonstrated rhyme awareness. Then posttests were administered to both groups followed by delayed posttests four or five weeks afterward. Both were tested for the ability to detect phonemes, but neither group demonstrated an increase in phonemic awareness on immediate and delayed post-tests. Results indicate that rhyme sensitivity did not precede phoneme sensitivity or have an effect upon it to promote phonemic awareness. Moreover, Muter, et al (1997) in a longitudinal study that measured children's reading achievement at ages 4, 5, 6, and 9, demonstrated that rhyme detection ability in preschool did not predict later reading achievement.

Phoneme segmentation and blending. While segmentation and blending are discretely different tasks, they are complementary and are often used together in experimental studies. Segmentation tasks have children extricate phonemes from spoken words to pronounce them in isolation, rather than coarticulate or blend them within words. Segmentation helps children investigate the complete pronunciation map in word spellings, while blending requires using the map to generate a pronunciation. Both skills play a harmonious role in decoding print and encoding speech. The question of how best to teach segmentation and blending has also been a subject of much research. Many studies confirm that using printed letters to segment phonemes was more beneficial for learning to segment, read, and spell than using markers, tapping, or Elkonin boxes (Ball & Blachman, 1991; Bradley & Bryant, 1983, 1985; Byrne & Fielding-Barnsley, 1989; Ehri & Wilce, 1987; Hohn & Ehri, 1983; Tangel & Blachman, 1992, 1995). Two meta-analyses also verify these findings (Bus & van Ijzendoorn, 1999; Ehri & Stahl, 2001).

In addition, several studies found that knowledge of how to segment spoken words had a stronger effect on reading achievement than did other PA tasks (Cunningham, 1990; Lundberg, Frost, & Petersen, 1988), and PA skills of segmenting and blending were found to be more reliable predictors of reading success than other PA tasks that did not include phoneme identity (O'Connor, Jenkins, & Slocum, 1995). Segmentation and blending of syllables was an easier task for beginners than segmenting and blending individual phonemes (Gleitman and Rozin, 1973, 1977). However, phoneme segmentation and blending of phonemes or subword parts produced greater benefits than rhyming (Martin & Byrne, 2002).

Similarly, Yeh and Connell (2008) found that four year old children from low income homes could be taught phoneme segmentation, blending, and letter-sound relationships. Children taught phoneme segmentation and blending performed phoneme manipulations better than children taught to rhyme or to learn new vocabulary. Phoneme segmentation skill was also found to be a clear predictor of future reading achievement, "results suggest that instruction emphasizing phoneme segmentation is not only more likely to promote phoneme segmentation skill, but also more likely to promote future reading ability than rhyming or vocabulary activities, even for highly disadvantaged children as young as 4 years old" (Yeh & Connell, 2008, p. 243). While this was a significant finding, the instructional period lasted 14 weeks, which was considerably longer than a quarter of an average school term, indicating that these skills are not readily acquired by young children and may require intensive instruction.

Other PA tasks

Phoneme elision. Deleting a phoneme (say stop without the /s/) is a more complex PA task and children with orthographic knowledge perform this task well. Yet the NRP found that it was an easier task for children to learn than blending. Anthony and colleagues (2003) had

similar results. They used two phoneme elision tasks and two blending tasks to try to establish a hierarchy of children's sensitivity to increasingly more complex language structures including word, syllable, onset-rime, and phoneme. Task difficulty increased from blending and elision identification with a two choice response (Which picture shows *farm* without the /f/?) to actual blending and elision tasks (Say *scar* without the /s/). The two-choice measure had low internal consistency compared with the other measures, but it also had the same surprising results as what the NRP found. Children were better at the elision identification task than they were at blending. Researchers noted that they observed children using strategies that seemed to help them answer correctly. In addition, they actually did better with elision of phonemes than elision of onsets.

Phoneme addition. An equally complex, higher order PA skill is phoneme addition. Comparable to phoneme elision, the subject is asked to blend an additional phoneme with a given word. For example, a child may be told to say *lay*, then add /p/ to *lay*. In order to perform the task, the subject must hold the new phoneme and the given word in working memory and be able to blend them. In a 2007 experimental study of four-year-olds with speech disorders, children were able to learn alliteration tasks, phoneme isolation, and phoneme segmentation of words, but few were able to perform the phoneme addition or deletion tasks since recognition is easier than manipulation (Hesketh, Dima, and Nelson, 2007).

Phoneme categorization. Bradley and Bryant (1985) used a phoneme categorization task with 4 and 5-year-olds that required them to identify similarities in words. They would be asked a question like, which one of these words is not like the other words? In a follow-up study three years later (N=368), correlations were found between performance on the original categorization task and performance on standardized achievement tests in reading, spelling, and math tests as well as the sound categorization delayed test and the WISC-R (Weschler, 1974).

Oddity task. Bradley and Bryant (1983) also used basic compare and contrast tasks with preschoolers. They found there was a highly significant relationship between pre-k oddity task scores and reading achievement in a three-year follow-up study. In this study, four groups received a different treatment. The groups received 40 individual tutoring sessions. One group compared beginning, middle, and final sounds in words. Another group learned how sounds are represented by the alphabet. A third group categorized words semantically, and the control group had no special training. Greatest gains were found in the phoneme-grapheme correspondence group.

Phoneme Identity Instruction. Evidence from Byrne and Fielding-Barnsley's (1990) study suggests that they may have correctly asserted that phoneme identity is a critical skill needed for developing phoneme awareness. After children successfully learned just nine phonemes, they demonstrated that they could identify new phonemes that had not been taught. Multiple follow-up studies confirmed the strength of teaching phoneme identity tasks as an effective means of initiating PA in young children (Byrne & Fielding-Barnsley, 1991, 1993, 1995; Byrne, Fielding-Barnsley, & Ashley, 2000).

In a similar study, Murray (1998) tested the effectiveness of teaching phoneme identity within the context of words, randomly assigning 48 kindergarten children to one of three conditions: phoneme identity training, phoneme manipulation, or a typical classroom language experience. Following training, children were assessed for word identification, oral vocabulary, alphabet knowledge, and phoneme awareness. Children who learned to manipulate phonemes made significantly greater gains on blending and segmentation tasks that were both auditory tasks, but children who learned to recognize phoneme identities within the context of words made significantly greater gains on a test of phonetic cue reading. Results showed measurable

growth in using the alphabet to identify written words, a distinguishing characteristic of understanding the alphabetic principle. Murray concluded that phoneme identity knowledge helped children apply the alphabetic principle in a reading task, but children who learned to segment and blend were restricted to performing only PA tasks without further application to reading. Since PA is not an end in itself, but a prerequisite skill associated with success in learning to read, it stands to reason that research needs to identify the most efficient means of acquiring PA for the sole purpose of developing the insight of the alphabetic principle.

Overview of Concepts About Print Studies

Concepts about print refers to the vocabulary of print, e.g., word, letters, sentence, page, period, big word, etc. In simplest terms, it is a way of introducing children to the vocabulary of text. Children may observe adults reading and have some understanding of the purpose of reading, to get a message from the print, but they are unaware of how the process works and often uncertain of what is referenced in print vocabulary (Strickland & Schickedanz, 2004). An effective approach to help children understand print concepts is direct teaching of print vocabulary during story reading (Landry, et al., 2006).

Children most often learn print concepts when adults read to them and comment using print vocabulary. Finger pointing while reading helps a child identify the distinctive features of words (Ehri & Sweet, 1991), that they include letters that have spaces between them, and longer words that use more letters and take up more space on a page. These are the characteristic features of words in print. Sometimes, however, children demonstrate confusion in their understanding of print terms, for example, short word versus long word. Word meanings interfere with features of the print in this case. Ferreiro and Teberosky (1979) found that children could not dissociate the features of a word, i.e., its length, height, or shape, from the item the

word represents. For instance, in trying to decide which word was longer, *puppy* or *dog*, the child would not attend to the features of the words in print, but select *dog*, since puppies are generally smaller in physical size.

Teaching print concepts within the authentic context of shared reading provides preschool children with an understanding of print terms that teachers may use when teaching children to read. A very recent study also found that teaching concepts about print to children at risk for learning disabilities was especially effective with e-books due to their multimedia nature (Shamir & Shlafer, 2011).

Letter Knowledge. ". . . There are reciprocal interactions between the development of letter knowledge and PA, such that each skill develops independently but promotes growth in the other, and that both skills are precursors of reading ability" (van Bysterveldt, Gillon, & Moran, 2006). One of the major variables known to influence early phonological awareness development is letter knowledge. Several decades of research demonstrate a strong relationship between letter knowledge and phonological awareness (Caravolas & Landerl, 2010). Alphabetic knowledge, both letter name and letter sound knowledge, are considered to be the primary prerequisite skills for developing phonological awareness (e.g., Johnston, Anderson, & Holligan, 1996; Lundberg, Frost, & Peterson, 1988; Treiman, Tincoff, Rodriguez, Mouzaki, & Francis, 1998). Intervention studies frequently pair letter knowledge and phonological awareness activities, because greater gains in literacy outcomes are obtained when phonological awareness activities are explicitly linked to learning letters associated with phonemes and larger phonological structures. (Oudeans, 2003).

Letter Names. Do children gain insight into the alphabetic principle from letter names? This is a well-researched question without a strong conclusion. Burgess and Lonigan (1998) for

example, found that phonological awareness facilitated learning letter names and letter sound connections, and contributed to an understanding of the relationship between print and speech. However, in a Treiman study (2003), letter names also interfered with phoneme identification when the letter name was not salient within words, or the letter name did not contain the phoneme.

Roberts (2003) studied how children use letter names in emergent literacy. In this study, three and four-year-olds in a half-day preschool program for low-income children were taught letters of the alphabet and letter names during large group instruction. On tasks of word identification, children did significantly better at identifying words that began with taught letter names than on words with untaught letter names. Although results of the study suggest that children learn to relate print and speech by finding links between letters in printed words and the names of the letters in corresponding spoken words, still they were unable to make a connection between letter names and phonemes, indicating more information was needed to acquire the alphabetic principle.

In one of many studies, Treiman and colleagues (2003) examined the relationship between letter naming and developing phonological awareness. Her study was in response to an earlier Ferreiro and Teberosky (1982) study, which proposed that young children familiar with the names of letters, use this knowledge to connect print with speech. Treiman tested this hypothesis in her study, examining how five-year-old children in Head Start programs in a northern urban area used letter names to identify whether target letters were part of words. Children were consistently correct when the letter name was pronounced within the word, such as *beach* that begins with /b/E/ rather than bone (/b/O/), which did not contain the letter name. Children also did better when the letter name was in the beginning condition rather than the

ending condition; for instance, it was harder to notice the letter name /e//f/ in *deaf.* Children produced more errors when deciding the first letter in wrong letter name words, saying *wife* began with *y*, than in other word types, suggesting that the letter name influenced the task. On the other hand, letter name knowledge often interfered with letter identification in spoken words when the entire letter name was not recognized within the word, indicating the children were not aware of the phoneme embedded in the letter names. On reading tasks, children did better at providing names of visually presented letters than identifying a phoneme associated with the letter, or a phoneme embedded in a letter name within spoken words, indicating they could produce letter names but not letter sounds, e.g., they would choose the spoken word *beach* as a word beginning with the letter *b* but not *bone.*

According to Ehri's theory of word learning (1998), young children without knowledge of the alphabetic principle perceive print as arbitrary strings of letters representing talk. Whether they know the names of the letters or not has no direct impact on word reading. Instead, prealphabetic children rely on visual cues in written language to distinguish words rather than process the letters within words as phonemic codes of oral language. Print in the environment that children can "read" with ease, e.g., the word *McDonalds* embedded in golden arches, is just a part of the logograph, or picture that represents an object. When familiar environmental print is decontextualized, that is, removed from its all too familiar logo, children no longer recognize the word (Treiman, et al., 1994; Masonheimer, et al., 1984). To advance to the partial alphabetic phase of word learning, children typically need direct instruction in the alphabetic nature of language in order to make the connection between the letters of the alphabet and pronunciations of phonemes in speech. Without this insight, they cannot make sense of the pronunciation map of speech that our writing system employs (Masonheimer, Drum, & Ehri, 1984). Letters help

children acquire PA because they provide meaning to otherwise meaningless phonemes, but letter names alone do not lead to the insight children need to develop PA and the alphabetic principle.

Other CAP. In its natural environment, print is not salient. Its features do not arouse the curiosity of children unless they are explicitly made aware of them. Some have found that reference to print is a rare occurrence in book conversations with children during shared story reading, unless the book is specifically written to feature letters and other print concepts. In most children's literature and shared reading time, references to print occur at very low rates if at all (Ezell & Justice, 2000; van Kleeck, Gillam, Hamilton, & McGrath, 1997).

Parents As Primary Instructors

> According to the 2005 Early Childhood Program Participation Survey of the NHES, 86% of 3-5 year olds not yet in kindergarten were told a story by a family member in the past week, 95% were taught letters, words, or numbers, and 98% of family members participated by reading to their child. (Iruka & Carver, 2006, p. 67)

It is a popular belief that if parents just read to their children, they will be ready for school. As stated earlier, reading aloud does help children's vocabulary and listening comprehension, but three decades of research on parents reading with children yielded data that only accounted for 8% of the variance in children's literacy achievement (Scarborough & Dobrich, 1994). This data, however, does not undermine parents as primary instructors. Instead, it provides motivation for researchers to disseminate the results of their work that ultimately will help parents make a difference in preparing their children for literacy.

Parental Effectiveness in Related Reading Interventions. How do children become proficient readers? The answer is complicated but researchers agree that early literacy success most often begins in the home. (Baker, Mackler, Sonnenschein, & Serpell, 2001; Sénéchal, LeFevre, 2002; Serpell, Sonnenschein, Baker, & Ganapathy, 2002). Children follow the modeling behavior of their parents and learn to value what parents value. Many parents are aware of this, and likewise, are concerned that their children acquire prerequisite literacy skills before entering a formal elementary school classroom. In a 2007 survey administered by the National Center for Education Statistics (NCES) within the U.S. Department of Education, 56% of parents surveyed believed that it was imperative to teach children the alphabet prior to kindergarten, and 45% believed they had to teach their children to read (O'Donnell & Mulligan, 2008). This concern is understandable since reading outcomes of elementary and secondary school children have changed very little since 1980 according to the National Assessment of Educational Progress [NAEP] (2009). Only small gains in reading proficiency have occurred among all grade levels tested, fourth and eighth grades, since this governmental agency began using a standardized measure to assess national progress in literacy in 1992. The median national score has fluctuated and risen only five points in 19 years at the fourth grade level and 4 points on grade eight scores. The incidence of learning disabilities in reading has seen some decreases among public school children with specific learning disabilities since 2002, but the increase from 1.46 to 2.47 million across nearly three decades from 1980 to 2009 (NCES, 2010) is cause for concern. Parents have reason to be wary of sending their children unprepared into a public education system that, statistically speaking, shows little evidence of change or improvement.

No matter their socio-economic status, children enter school with a wide range of literacy knowledge and experiences based on parent influence and the quality of childcare provided. These experiences contribute to reading readiness (Adams, 1990; Arnold & Whitehurst, 1994; Bingham, 2007; Sénéchal & LeFevre, 2002). More recently, the National Center for Educational Statistics [NCES] (2007) conducted phone and in-person interviews of an estimated 8000 survey respondents to obtain a sample of pre-literacy experiences in the home. Fifty-eight percent of parents reported reading to their children an average of 20 minutes per day in both low income and average income households, suggesting a welcome trend in parent involvement.

SBRR tells us that PA and letter recognition are critical skills needed before formal reading instruction begins (Adams, 1990; Anthony et al., 2007; Fraser, et al., 2010). Story reading, however, does not contribute to children acquiring the two critical skills needed before formal reading instruction begins, PA and letter recognition, as indicated in the data from this survey. Approximately 56% of parents believed it was important to teach children the alphabet, however, only 1% actually talked to their children about letters in the course of reading stories, only 32% of preschool children aged 3 through 6 reportedly recognized the letters of the alphabet (NCES, 2007). At the same time, 8% of this sample reportedly read words in books. These figures suggest that this group of parents understood the value of literacy experiences, but the majority of these interested parents were unable to help their children develop the skills needed to become successful readers.

Some children learn to read before entering a kindergarten classroom as the NCES reported, but more children enter school unprepared. Kaplan and Walpole (2005) examined the differences of children in poverty level households compared to middle and upper class children. At the start of kindergarten, more children living in poverty level households began reading

instruction with low alphabet knowledge compared with their peers living above poverty. By the spring of kindergarten, 75% of children living above poverty attained at least advanced phonemic awareness, but only 53% of peers living below poverty did. In fall of first grade, 43% of those above poverty were at an early word learning phase or had early reading comprehension compared with 21% of those below poverty. And by the end of first grade, 87% of the above poverty group were early word readers, in contrast to 30% of low-SES peers.

Research findings from 50 years of investigation pinpoint a lack of PA and letter recognition as key causal factors in the great divide between those with rich literacy skills and those with poor literacy skills (Beck, McKeown, & Kucan, 2002). What at-risk groups of children fail to develop an understanding of the alphabetic principle, i.e., the insight that oral language is encoded in print, and that print is a pronunciation map for speech.

Parents as Instructors. Can parents be trained to introduce PA to their children? Many parents have been successful at teaching letter recognition (Stanovich, 1986) and comprehension strategies (Haney & Hill, 2004; Lachner, Zevenbergen, & Zevenbergen, 2008), so it stands to reason that with guidance and appropriate materials, they may be able to accomplish this challenging task as well. In a 2006 study (van Kleeck, 2003), researchers were able to train parents to make use of a dialogic reading strategy to help their preschool children make gains in oral language and emergent literacy skills during storybook reading. Though the number of participants was small, the video-based training method proved to be highly effective in changing the parents approach to shared reading and the children's verbal responses during reading. In a recent study parents, predominantly mothers, were trained to help their four-year-old preschool children learn about print concepts, alphabet knowledge, or story engagement with pictures (Blom-Hoffman, O'Neil-Pirozzi, Volpe, Cutting, & Bissinger, 2006). All of these

children were identified with language impairment. The greatest gains for children were found within the print concepts condition. However, in examining procedures used in the phonological condition, children were asked to respond to PA tasks without any type of instruction or modeling that would help them understand the phonological structure of spoken language. Instead, parents prompted a response with questions. Three asked about rhyme features of words, e.g., "Did you hear a word that rhymes with cat?" Three focused on onsets, e.g., "What sound does house start with?" And three questions referred to syllable structure, e.g., "How many parts are in the word *monster*?" Since children do not make the metalinguistic shift without explicit instruction (Justice et al., 2011) such results tell us nothing about parent efficacy in teaching phonemic awareness.

Parents are up to the task, however. They are often the primary providers of early intervention strategies for preschool children with disabilities. Researchers recruited parents of four-year-old children with Down's syndrome to participate in an intervention to develop early literacy skills, specifically PA and letter recognition. Parents were provided training and materials to teach their children some selected phoneme-grapheme correspondences during a parent-child book reading activity. By calling the children's attention to letters and corresponding phonemes, these preschool children with special needs were able to learn phoneme features and identify them in speech. Investigators found a significant treatment effect on phonological awareness and letter knowledge for children with Down syndrome and above-chance performance on initial phoneme identity tasks related to letter knowledge of the target phonemes taught (van Bysterveldt, Gillon & Moran, 2006). Research with school-age children indicated that reading disability was highly correlated with poor PA, compared to readers at the same reading level in lower grades without documented disabilities (Bradley & Bryant, 1983;

Bruck, 1992; Fawcett & Nicholson, 1995) yet even those with learning disabilities could benefit from PA instruction.

Other Instructional Considerations

Instructional Conversation. Instructional conversation is a teaching method that involves both the learner and the teacher in a discussion of ideas. Goldenberg (1991) describes the critical features as:

> interesting and engaging. . . about an idea or a concept that has meaning and relevance for students. . . a focus that . . . remains discernible throughout. There is a high level of participation, without undue domination by any one individual, particularly the teacher. Students engage in extended discussions—conversations—with the teacher and among themselves. (Goldenberg, 1991, p.3)

Because instruction in the home is largely unplanned and spontaneous, instructional conversation lends itself to the type of informal teaching that children often encounter in the home, teaching that responds to children during a teachable moment when conversation aims to guide children's behavior in relation to the events of the moment. Instructional conversations with preschool children are limited by children's verbal skills, and recent studies have addressed the need to include nonverbal forms of communication and adaptations to children's developing verbal communication skills during instructional conversations (Goh, Yamauchi, & Ratliffe, 2012). Asking open-ended questions leading to conversations while reading stories, a common instructional practice in preschools, is an opportunity to introduce children to new ideas in relation to the story or even to elements of the reading process as this study proposes.

Age Appropriate Instruction. Byrne, Fielding-Barnsley, and Ashley (2000) conducted research that demonstrated preschool children benefitted from early PA instruction. Even in

follow-up studies six years after training in kindergarten, preschool instruction in phoneme identity had modest but noticeable effects on later reading performance. At the same time, children who were slow to gain phonemic awareness were also slow in reading growth gains.

Treiman and Zukowski (1991) demonstrated that among English-speaking children, phonological awareness emerged gradually. By age four, children could reliably make judgments about the similarity of syllables, and by age five such judgments could be made about sub-syllabic units. Results of their study indicated that children typically were able to make reliable judgments about phonemes only after formal schooling began. The latter finding is consistent with the widely held view that instruction in alphabetic literacy is critical to the emergence of PA (Castles & Coltheart, 2004; Ziegler & Goswami, 2005). More recently, however, Caravolas & Landerl (2010) investigated whether experience with syllable structure in spoken language influenced phoneme awareness prior to formal instruction in reading. Syllable awareness was found to be largely related to children's experiences with the syllable structure of their native languages rather than age or entry into school.

Researchers (Justice, Invernizzi, Geller, Sullivan, & Welsch, 2005) examined the Virginia Early Reading Initiative screening data (N=2161) of 4 and 5 year-olds in at-risk preschool programs to identify literacy deficits of preschoolers prior to kindergarten enrollment. They were also interested in the question of age, whether it was a factor in emerging literacy skills. Screening tests were categorized as written language awareness tests and verbal memory tests. Language awareness included both written and oral language awareness: upper-case alphabet knowledge, print knowledge, concept of word, name writing, and phonological awareness tests of rhyme and beginning sounds. Data indicated there were statistically significant differences among age levels (age 4 N=1952; age 5 N=209). Researchers also noted

that African American (N=1166) and Caucasian children (N=891) performed better than Hispanic children (N=131), and girls outperformed boys on all tasks except for rhyme and beginning sounds for which there was a small effect size (.11). These findings were similar to those of other studies of preschool children, identifying measurable levels of literacy skills in a variety of areas linked to later literacy achievement (Sénéchal & LeFevre, 2002; Storch & Whitehurst, 2002; NICHHD, 2005). While there is strong correlational evidence that preschool children do not typically demonstrate phoneme awareness, there is no evidence that an intervention to teach phoneme awareness is developmentally inappropriate. Reading development studies with preschool children indicate that very young children can develop PA through intervention. Byrne and Fielding-Barnsley (1990) provided evidence that children as young as three years were able to develop phoneme awareness and transfer knowledge of taught phonemes to untaught phonemes. Bergeron and colleagues (2009) made this claim based on their research involving hearing impaired children, “preschool children who were deaf or hard of hearing with some speech perception abilities could learn phoneme-grapheme correspondences through explicit auditory skill instruction with language and visual support" (p. 87). Additionally, use of pictures aided memory and use of a combination of recognition tasks and production tasks allowed researchers to measure a broad range of phonological awareness abilities among preschool children (Anthony, Williams, McDonald, & Francis, 2007).

Summary

Research is often designed to test or strengthen theory. Based on theoretical perspectives reviewed in this chapter, the theoretical model that informs most PA instruction arises from the phonological sensitivity model that proposes an ever-growing sensitivity to more subtle levels of oral language beginning with large language units such as words, to increasingly smaller units

such as syllables and onsets, ending with the final smallest unit, the phoneme. On the other hand, researchers have found evidence that preschool children can develop PA through a phoneme-first model that may be effective for introducing children to individual phonemes, building cognitive links for easy retrieval. At work in this model are two cognitive theories, dual coding and spreading activation.

An effective instructional program teaches children to identify phonemes within words while introducing the letters associated with phonemes. It provides a mental representation of phonemes to aid recall, and allows children to practice locating phonemes in spoken words and in reading tasks that make phonemes relevant, meaningful, and memorable, all elements of effective instruction. Such activities have been found to lead children to develop the insight of the alphabetic principle, the cognitive link between speech with print.

While there are many ways to measure phoneme awareness, reviews are mixed as to whether any particular type of phoneme awareness skill is a better predictor of future reading ability. We do know that children who could segment and blend performed better on reading tasks than children who could identify rhymes. There is also strong evidence that teaching phoneme identities along with their corresponding letters was an effective way to help preschool children develop the alphabetic principle.

Finally, there is a growing research base showing that parents can be effective in providing literacy instruction to their preschool children, even to children with cognitive disabilities. It is therefore reasonable to conclude that with proper training, parents would be able to teach children about phonemes and print concepts through informal instructional conversations while reading children's books aloud.

CHAPTER 3

METHODS

This section provides details on assessments, interventions, and how data were analyzed, beginning with a rationale for the population targeted in this study. The purpose of the study was to test the hypotheses that early preschool intervention in phoneme awareness is effective in preparing children to read and that parents can be trained to help their children acquire the alphabetic principle, the insight that print represents speech sounds. Therefore, it was necessary to identify a population of parents who were available and interested in helping their young children prepare for formal reading instruction. Rather than target low SES families for the purpose of addressing the achievement gap between economic groups, recruitment was done within the community without regard to SES status. This decision was partially due to poor rates of participation in another study that targeted at-risk children and their parents from lower SES households (Warren, 2009). Participants were families willing to make a commitment to the study for a period of one month and follow through with assessments after completing the intervention.

Description of Participants

Recruitment. Parents and children in a rural southern college-town were recruited primarily from childcare centers, through posters on campus, by word of mouth, through the public library, and through e-mail (see recruitment flyer in Appendix B). Participants indicated that they read several times a week or daily with their children, which meant there would be little change in the routine reading experiences children were already having in their homes, and a

greater likelihood that parents would find participation amenable to their routines. Sending flyers home with children yielded only seven families off campus and seven at the on-campus Early Learning Center, three of whom dropped out of the study. However, the response by word-of-mouth was more successful, yielding the majority of interested participants.

Subjects. The age of participating children at the beginning of the study ranged from 43 to 69 months and 45 to 71 months by the second posttest day. Prior to the study none had entered kindergarten, but some were tested for kindergarten enrollment during their participation period. In addition, three children started kindergarten during the delayed posttest period but only one had spent more than two weeks in kindergarten prior to the delayed posttest.

The criteria for parent participation included a commitment to read to children from the materials provided and instruct children as outlined in the procedures video. Eligibility for children was determined by pretest screening performance. Children who were accepted into the study could read at least four letters of the alphabet, fewer than 70% of sight words on a list of high frequency words kindergarten level, and no pseudowords. Forty-three children were screened for participation; however, only thirty-eight were found to be eligible, with three children unable to name a sufficient number of letters and two able to read the kindergarten-level wordlist as well as more than one pseudoword. At the end of the study, one family had dropped out of the study and three families did not respond to requests to posttest, leaving 34 families completing the study.

Eighty-five percent of subjects were native English speakers and 15% were English language learners. Fifty-three percent of subjects reported household income between $30,000 and $100,000 and 41% had income over $100,000, but less than $250,000. Two participants, 6%, were college students who reported income below $30,000. Most parents, 79%, reported that

they read daily to their children, 12% read three to five times per week, and three parents, 9%, indicated that they read between two to four times per month.

Materials. Instructional materials included training videos that explained and modeled instructional procedures, instructional scripts for parents with black and white copies of children's books, eight illustrated books for children that were six to eight pages in length, and other materials described below. (See Figure 2 for a comparison of materials and lesson components for CAP and PA groups.)

Training videos. Parents received training CDs that corresponded to their intervention condition. The CDs explained procedures and modeled how to have instructional conversations while reading. In the phoneme instruction condition, a model lesson with a four-year-old model showed parents how to teach the phoneme and its associated gesture. It included a sample instructional conversation with the young assistant, showing parents how to introduce a story, discuss story vocabulary, and practice finding phonemes. In the print concept condition, a model lesson demonstrated similar instructions as the PA model; however, parents were shown how to discuss print concepts with their children and search for a target letter rather than identify phonemes.

Instructional books. Eight children's books for both conditions consisted of eight different stories that addressed preschool interests. For instance, the first book was about a misunderstanding between worker ants and the queen ant, while the third book was about a little girl's bad haircut. Characters in the stories were a variety of animals, insects, and young children. Differences between PA and CAP books were restricted to book titles and minor alterations to the story endings in the PA series that featured a "tongue tickler" on the final page. The tongue tickler was an alliterative statement that introduced the phoneme featured in the

book. It also served as a title of the corresponding PA book. Both sets contained the same target vocabulary for instruction. In the PA set, stories provided ample opportunities to draw attention to a target phoneme. In the CAP set, stories allowed parents to help children learn print concepts such as letter, word, message, right, left, or top of page. Along with the stories, parents received an instructional script to guide teaching, including optional feedback responses to address children's errors. A sample script can be found in Appendix D.

Other materials. Other materials for the PA group included phoneme analogy images with embedded letters representing a target phoneme, paper for print practice, and worksheets (see Appendix D). The analogy images reminded children of a sound associated with the image. For instance, the letter *b* showed a picture of a drumstick beside a drum and children were told that the letter *b* tells us to say /b/, the sound we hear when we bang on a drum (see Appendix D for a complete set of phoneme analogy cards). Worksheets were coloring book style images that represented words containing targeted phonemes. Children were instructed to color images containing target phonemes, providing further practice in finding phonemes on their own.

In the CAP group, materials included letter cards with upper and lowercase printed letters, worksheets, and special primary paper with instructions for print practice. Identical paper and printing instructions were also provided to the PA group. Lettercards provided a model to help children hunt for letters within books, and the CAP worksheets were designed to help children practice their understanding of a print concept. For example, when children learned what a message was, they circled images that represented messages (those containing captions or other print) and colored images that were pictures without messages. Both groups were given explicit print practice with special primary paper that helped children note the placement and the direction in which the letters were formed.

Figure 2. Experimental and control group instructional components.

	Conditions	
Instructional Components	**CAP**	**PA**
Vocabulary	Explicit Instruction in conversation Q&A format	Explicit Instruction in conversation Q&A format
Plot	Instructional Conversation about events	Instructional Conversation about events
Print Concepts	Explicit Instruction in print vocabulary: Message, print, picture, title, top, bottom, first, next, last, left, right, beginning, ending, period, sentence, question mark, quote, exclamation, space, big word, little word, capital and lower-case letters *A,a,B,b,F,f,H,h,M,m,O,o,S,s,W,w.*	No instruction in print vocabulary but conversation may reference letter and word.
Phoneme Identification	No instruction in phonemes	Phonemes taught with corresponding letter, analogous graphic representation, and memorable gesture: /a/, /b/, /f/, /h/, /m/, /o/, /s/, /w/.

Figure 2. Visual organizer compares and contrasts components of each condition. Two components were identical and two were different. Both used the same children's books for instructional conversations that were only altered to change the end of the story from an alliterative to a non-alliterative statement.

Assessments

Pretests. The following pretests were used for screening purposes and to establish a baseline of children's knowledge. Since the study was conducted to identify prealphabetic readers, screening measures were used to identify children with either too little or too much knowledge of reading. Children who did not know enough letters were not included because assessment data could not be acquired since some knowledge of the alphabet was necessary to perform the assessments. Some children may have demonstrated phoneme awareness, letter recognition, and knowledge of letter-sound correspondences, but they may not have understood the connection between letters and reading. The criteria used to screen out children who made the connection was pseudoword reading or reading up to 14 out of 20 sight words on a pre-primer reading inventory list. Children who demonstrated beginning reading skills by reading sight words or a single pseudoword were not included in the study because they may have already acquired the alphabetic principle.

Letter recognition (LR). This test consisted of a randomly arranged set of upper and lowercase letters with two additional letters in a different font: *a* and *g*. This format was similar to the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (Kaminski & Good, 1998) test of letter recognition for children in kindergarten and first grade but only half as long. Children were asked to say the names of each letter across the rows and were given a demonstration of how to touch each letter, say its name, and where to return at the end of the row. Fluency was not a component of this test as it is with DIBELS, because children were not enrolled in kindergarten where fluency is an important factor for successful phonics instruction. While some prealphabetic readers may be fluent, it would not be a predictor of success in this

study. Instead, knowledge of some letters, such as the letters of children's names, would indicate that they are capable of learning new letters.

Test of phoneme identities (TPI). Adapted from the original Test of Phoneme Identities (Murray et al., 2000), this preschool version recognized the ability of children to identify an isolated phoneme within a spoken word. Children began by listening to a sentence and then an isolated phoneme that they were asked to repeat. Afterwards they were asked to identify the word in which the target phoneme was heard: e.g., "Would you share a pear? Say /p/. Do you hear /p/ in share or pair?" The TPI was a better predictor of kindergarten children's ability to identify phonemes in words than the Yopp-Singer Segmentation Test (Yopp, 1995) and the Test of Phonological Awareness [TOPA] (Torgesen & Bryant, 1994) in Murray's controlled experiment (2000). Murray's original TPI-pretest contained 38 items that included all of the consonants, consonant digraphs /sh/, /th/, /ch/, long vowels, short vowels, and other vowels such as diphthongs /oi/, /aw/, and r-controlled vowels (/er/, /ar/). The preschool version created for this study contained 13 consonants, four long vowels, and three short vowels, for a total of 20 items in three different versions. Each version measured knowledge of the same phonemes.

Word reading. A preprimer word list from the *Basic Reading Inventory* (Johns, 2010) was administered for screening purposes. The commercial informal reading inventory is used to measure grade level competence in word reading. The preprimer list was comprised of twenty high-frequency, familiar words that children may encounter in beginning reading materials. Children able to obtain a passing score of 14 were considered ineligible for the study. While some children may recognize sight words commonly found in preprimer material, this is not an indicator of the ability to decode words they have never seen before.

Pseudoword reading. The pseudoword reading test was a set of nonsense words that followed common, regular spelling patterns in contrast to the DIBELS nonsense word tests that do not use regular spelling patterns. For instance, in English, short vowel words do not end with a single letter *k* or a *j*, while DIBELS includes words like *uk, boj,* and *zik*. The test I uses consisted of five short vowel words that were similar in their construction to real regular words. For instance, *fim*, *lat*, and *dub* are analogous to the regular words *brim*, *sat*, and *rub*. If a child was able to decode even one pseudoword, this was an indicator that the child already had decoding skills, which made him or her ineligible for participation in the study for the simple reason that these children would derive no new knowledge or benefits from the study. This particular version of the test has not been normed or validated in an experimental study; however, it has been a reliable indicator of phonics knowledge in clinical settings with preservice teachers tutoring thousands of struggling readers for the past 20 years at Auburn University, and it is similar in construction to the DIBELS nonsense word subtest, which is a valid standardized test. Children who demonstrate the ability to read regular pseudowords have consistently made progress in reading acquisition and have gained one grade level in reading ability while receiving tutoring once a week during a single semester period of 15 weeks.

Test of phonetic cue reading (PCR). In this assessment, children were shown a word written on a notecard. Then they were asked to use the letters to decide between two word choices to identify the word. Directions script: "I am going to show you a real word. Then I will tell you two words that this word might be. Use all the letters in the word to help you decide which word you think it is." As I slowly pronounced the word, I pointed to all the letters in the word on the notecard. The PCR pretest version consisted of 12 words. The pair choices either began with a letter that would be taught in the study or the false choice began with the letter. For

example, I showed children the word *FOG* and asked, "Is this *log* or *fog*?" Two items featured vowels in the middle of words. For *TAP* I asked "Is this *tap* or *top*." The PCR has been found to be a reliable measure of children's ability to apply phoneme identity knowledge to word reading, a preliminary indicator that children have acquired the alphabetic principle, using initial letters to signal word identity (Byrne & Fielding-Barnsley, 1990; Murray, 1998).

Concepts About Print (CAP). This assessment, adapted from Marie Clay's Concepts About Print test (Clay, 1972), measured children's understanding of book language. The following items were included: Concepts about position (first, last, top, bottom, beginning, ending where text begin and ends, return sweep, concept of sentence, word, letter, and special marks (punctuation). The test was administered while viewing a picture book with the subject, who responded to requests such as, "Point to the place where you would start reading." The same test was used for pretest, posttest, and delayed posttest; however, a variety of picture books were used in each assessment to reduce the testing effect threat to internal validity. The test is an adaptation of Marie Clay's widely used concepts about print test, found to be a valid, reliable measure of children's understanding of print vocabulary.

Assessment of Vocabulary Knowledge. This was a researcher-made assessment to measure knowledge of selected words in the stories that were either unusual or used in unique ways. Words were repeated in the stories to provide multiple encounters with the same words. Pictures or a simple dichotomous yes-no response were used to help young children demonstrate understanding of selected words. Vocabulary was taken from the set of eight books used in the study. Pretest scores indicated familiarity with words while posttest scores measured learning resulting from story reading and vocabulary conversations.

Posttest Assessments. Posttests measured changes resulting from interventions. The following posttests were used: the letter recognition test, phonetic cue reading, pseudoword reading, Test of Phoneme Identities ©, CAP, and informal vocabulary test. Delayed posttests were administered approximately two weeks after the first posttests. Both posttests and delayed posttests were variations of the pretests, similar in structure, but with different test items, designed to avoid testing threats to internal validity. The vocabulary test was not administered in the second follow-up posttest since it was not an indicator of learning concepts about print or phonemes but more a measure of verbal knowledge, functioning as an intelligence test. The CAP test was the same test for the pre and posttests, with a section on punctuation on the final posttest.

Parent Training Procedures

After the screening/pretesting process, parents were randomly assigned to either the CAP condition or the PA condition (See subsection "Components of the Research Design" for an explanation of random assignment on p. 66). Parent training was done via an instructional CD that explained and modeled procedures. Parents were asked to view the CD for initial instructions prior to reading to their children. Procedures for vocabulary instruction were the same for both the experimental and control group participants. Procedures for teaching PA and CAP included explanations and examples of how to use instructional conversations while reading the story. Along with books, parents had a sample script to help them ask appropriate questions and guide their children to understand the target concept of each book. Parents were asked to keep a record of time spent on instructional reading and also provide anecdotal feedback on how lessons went. Parents were asked whether the children expressed interest and

engagement by their attention to the stories, indicated by eye contact, and their response to questions about vocabulary, print concepts, or phonemes.

Lessons were conducted on two days of choice for four weeks with a day of review following each teaching day. Parents were asked to first read the book through and pause at the end of each page to discuss the plot or a target vocabulary words on the page. Books were six to eight pages in length, with approximately 150-250 words per book. Afterwards, parents were instructed to read the book again and inform the child that the second time the story was read, they were going to talk about some things that people do when they read.

Vocabulary instruction. Parents were directed to read each story and pause periodically to help their child understand story vocabulary and story meaning. They began with a booktalk or book introduction designed to build interest and curiosity about the plot, then proceeded with the story and informal conversation about story events and unusual words.

The following is a sample booktalk from the story *Bunnies Are Not Lunch:* "This story is called *Bunnies Are Not Lunch*! Would you want to eat a bunny for lunch? In this story, a boy named Brad visits his friend Abe. Brad has a pet bunny with him. After they play with the bunny a while the bunny wanders off. Soon Brad hears his baby brother crying. We'll have to read the story to find out where the bunny goes and why the baby is crying. I hope he isn't someone's lunch."

Vocabulary instruction followed the *Rich Instruction* model of Beck, McKeown, and Kuccan (2002). In this model of instruction, words are defined in simple language for the child, compared with known words, contrasted with opposites, and used in additional contexts. The format for instruction was conversational dialogue with the child about vocabulary to enhance the child's understanding of the story. The entire story was read with periodic pauses to discuss

vocabulary. In addition, parents were directed to discuss the plot and other story elements to provide background knowledge necessary for understanding the story.

The following is a sample vocabulary lesson from *Bunnies Are Not Lunch:*

"After first reading: Did you ever hear the word holler before? Holler means to yell or say something very loud to get someone's attention. We don't talk softly when we holler because that won't get anyone's attention. If you were taking a walk with me and we were about to cross the street, would you holler 'stop' if you saw a car coming by fast? Yes! Would we whisper or shout if we hollered? Do you think if a baby like little Barney bit you, you would holler 'ow' like Abe?"

PA Intervention. In the experimental group, parents were instructed to read the story through and discuss vocabulary and story plot with their children. After the first reading, parents were asked to give a phoneme awareness lesson using materials provided at the end of the text. For example, in the first book, *Abby the Ant Asked for an Apple*, children were shown a picture of a crying baby with a lowercase *a* embedded in the baby's open mouth. The script reads as follows.

> Say: This little baby is crying. She says /a/ when she cries. (Exaggerate /a/.) Then introduce your child to the letter, the letter sound, and the way your mouth looks when you say it, directing your child to look in a mirror. Also associate the baby image with the sound of a baby crying and a gesture to be used as a signal that the sound was heard (rub your eyes like a crying baby when you hear /a/). "*a* is the letter we write for the sound /a/. It sounds like a baby crying /a/a/a/a/, and your mouth is open a little so your teeth show when you say /a/."

Instruction continued with helping the child pay attention to the vocal gesture made when pronouncing the phoneme /a/. “Say: Look in the mirror at your mouth when you say /a/. It’s a little open and your teeth show, /a/. I’m going to say our tongue tickler from the story and show you how I know I heard /a/ in some words.”

Parents then modeled for their child how to find the target phoneme. “Say: When I say *Abby*, I feel my mouth open a little and it sounds like a baby’s cry /a/. Now I’m going to try another word that you know: *mommy*. I didn’t hear /a/ in *mommy*. I didn’t feel my mouth open like a baby’s cry and I didn’t hear the baby cry. You try saying *Abby* and look at your mouth in the mirror to see if it opens a little and you hear the baby cry. Now we’ll try the whole tongue tickler and you can rub your eyes when you hear me say /a/. *Abby the ant asked for an apple*.” [Be sure to model rubbing your eyes as you exaggerate the /a/ at the beginning of words.] “Let’s try it again and break off the crybaby sounds: A-bby the a-nt a-sked for a-n a-pple.”

Following practice with the tongue tickler, parents were instructed to help their children identify the /a/ in a new set of words through a simple oral discrimination task. “Say: I am going to say some words. If you hear /a/ in any of the words that I say, rub your eyes like a baby. *After, before, animal, vegetable.*” If your child does not readily hear the phoneme in the correct words, exaggerate and isolate the phoneme by repeating the word slowly and telling your child when you hear /a/, pointing out your open mouth, and noting the crybaby sound /a/.

After oral practice identifying phonemes, parents helped children learn the features of the letters associated with the phoneme. Children practiced writing the letter (See Figure 7 in Appendix D) and also practiced identifying letters in print (see Appendix D for a complete script of a PA lesson).

CAP Intervention. The purpose of this intervention was to acquaint the child with vocabulary about print such as message, title, sentence, word, letter, or period. Children also learned the direction in which print is read and where to continue to when you reach the end of a line. This necessitated learning about directional words such as *top, bottom, beginning, end, left*, and *right*.

The following excerpt is a sample of how parents used conversational dialogue to teach their children about a print concept, beginning with how to introduce the idea of a print concept. This is a sample lesson from *Queen Abby's Message*. The main focus of this lesson is to explicitly explain several vocabulary terms about print, namely: *title, message, print*, and *picture*.

> Say: This time when I read the story we're going to talk about how people read.
>
> Do you know where to find the name of the story? [Wait for child response] A message is something that we say or write, like this right here [point to print on the page.] The print, not the picture, gives us the message.
>
> Respond [point to words on front cover while reading them]. I call the book name the *title*. The title of this story is *Queen Abby's Message.* It is written right here. [point to title]
>
> What do we call this? [point to title and give feedback to child with affirmation or correction]
>
> The title gives us an idea of what the book is about.
>
> Since we just read this story, can you tell me what this book is about?
>
> [Respond to child's answer] Yes, or no, it's about the queen's message.

Because letters are a print concept, children in this condition were also shown the same target letters as the PA group learned. They hunted for letters in each book, and

they practiced printing the letters after reading the stories. Phonemes associated with the letters were not introduced or pronounced in isolation in the control group (see Appendix E for a complete sample script of a print concepts lesson).

Components of the Research Design

Random assignment. This study used a pretest-posttest true experimental design with an experimental group and a treated control group. The population consisted of voluntary participants who were randomly assigned to one of two treatments, the CAP or PA group. Random assignment to groups was done by first creating a case number for every possible participant, with the expectation of having 40 participants. Numbers ranged from 101-140. Then I used a computer to generate a list of random numbers from 1-40 (Timestamp: 2013-03-18 18:36:24 UTC). These numbers were combined with the sequential case numbers to create a subject number. Subject numbers ending in odd numbers were assigned to the PA group, and subject numbers ending in even numbers became control group participants. As people completed permission forms, they were assigned to the next sequential number that randomly placed them in either the experimental group or the control group; for example, the first subject number generated was 10117, the second 10239, and the tenth participant's number was 11032.

Independent Variables. Besides the independent variable group, with CAP as the control and PA as the experimental group, other independent variables of interest in the design were children's age and the amount of instructional time reported by parents. I categorized children's ages in months into a broader range of ages: older threes and younger fours were in the 45 to 55 month range, and older fours and fives were in the over 56 category. This placed equal numbers into two groups, better reflecting age in years from pretest to posttest. The other independent variable of interest, parent time on task, was computed as a compliance factor.

Instructions given to parents suggested that 15 to 20 minutes was an adequate amount of time to read the study books through twice and have a lesson, so this time range was used as an indicator of fidelity to treatment. I multiplied 16 books, which included eight study books plus eight review books, by 15 minutes and by 20 minutes respectively to create a fidelity-to-treatment range, 240 to 320 minutes. I categorized individual time scores as within the range of expected time of 15 to 20 minutes per book, below the range of expected time for <240 minutes, or above the expected range for >320 minutes. This factor was used to address the fifth research question.

Dependent variables. Posttest scores were dependent outcome variables used to test null hypotheses. The first hypothesis was tested with scores on the TPI. The TPI is a reliable indictor of whether a child has PA and a score of 14+ has a 95% probability of not occurring by chance. The PCR outcome measure investigated hypothesis two, that children who acquired PA would also be able to apply it to a word reading task, evidence of acquiring the alphabetic principle. A score of 9+ has a 95% probability of not occurring by chance. CAP scores measured concepts of print knowledge. A score of 16+ has a 95% probability of not occurring by chance. Letter recognition was expected to be a covariate, initially, due to its predictive status in the literature, and pretest-posttest vocabulary scores were expected to serve as an indicator of intelligence. Pretests and posttests measured changes before and after interventions with an additional delayed posttest measuring whether learning was sustained.

Statistical Tests. There were several factors of interest in the study: group, age, and amount of parent time spent on instruction. Because the sample size dwindled to only 34 cases and assumptions could not be met for two-way repeated measures analyses, one-way ANCOVAs were conducted separately to examine the effects of each factor (group, age, instructional time) on the dependent variables: TPI, PCR, and CAP while pretests TPI, PCR, and CAP data were

used as a covariate for each respective measure when assumptions for ANCOVAs were met. The research literature indicated that letter recognition is a strong predictor of reading achievement so it was considered as a possible alternative covariate. Results of a preliminary repeated measures analysis indicated that the sphericity assumption could not be met, so the original plan to use repeated measures to analyze data was abandoned, because it could not yield reliable results. Independent samples *t* tests were conducted to examine pretest data before determining that it could be used as a covariate.

Summary

This chapter presented a brief overview of research design and methodology that were used in the study. It included a description of participants, procedures, sample scripts, an explanation of the variables, and the statistical model that was used to analyze data. In addition, it described the different treatment groups, assessment instruments, data collection method, and validity of the instruments used to measure treatment outcomes.

CHAPTER 4

RESULTS

This study was undertaken to investigate whether parents could teach their children key pre-literacy skills to help children be prepared for literacy instruction in school. Research guided the development of materials for parents to use, and explicit scripts were designed to assist in the parent intervention. This section highlights the results of the intervention, including results from the statistical analysis of assessment data, and an overview of the qualitative information acquired from feedback forms completed by parents (see Appendix C).

Descriptive Statistics

I examined group characteristics across categories to see how the population sample was distributed. Most of the within-subjects factors were not relevant to any of the hypotheses investigated in this study, but their relevance may be appropriate in follow-up studies. For a full list of characteristics of participants, see Table 1.

Research Questions

Data were analyzed to answer the following research questions. In these questions *PA* refers to the group who learned phoneme identities while *PA performance* refers to scores on the TPI and PCT. *CAP* refers to the group who learned concepts about print while *CAP performance* refers to CAP test scores.

1) To what extent do preschool children in the PA treatment demonstrate knowledge of phoneme identities on the TPI compared to children in the CAP treatment? 2) To what extend do preschool children in the PA treatment apply letter-sound knowledge to identify words in

phonetic cue reading compared to children in the CAP treatment? 3) To what extent do preschool children in the CAP treatment demonstrate gains on the CAP test compared to children in the PA treatment? 4) To what extent do children differ in PA or CAP performance as a function of age? 5) To what extent do children differ in PA or CAP performance as a function of time spent on instruction?

Table 1

Summary of Descriptive Statistics

Factor	PA Group% (N = 17)		CAP Group% (N = 17)	
Gender				
Male	38%	(13)	29%	(10)
Female	12%	(4)	21%	(7)
Language				
ELL	6%	(2)	9%	(3)
Native English	44%	(15)	41%	(14)
Annual Household Income				
Below $30K	6%	(2)	0%	(0)
$30K - $99.9K	24%	(8)	26%	(9)
$100K - $250K	20.5 %	(7)	23.5%	(8)
Age Group				
45-55 months	24%	(8)	24%	(8)
56-71 months	26%	(9)	26%	(9)
Reading Frequency				
Daily	44%	(15)	35%	(12)
3-5 times per week	6%	(2)	6%	(2)
2-4 times per month	0%	(0)	9%	(3)

Results of Analyses

Because of ceiling effects in one of the pretests, ANCOVAs were used as the preferred method of data analysis to consistently factor out respective pretest performance. The strength of the relationship was rated using the following criteria: partial eta squared (η^2) conventional cutoffs while holding the covariate constant were .01 for low, .06 for medium, and .14 for high in describing the proportion of variance of the dependent variable related to the factor (Green & Salkind, 2008). The following assumptions had to be addressed before data were analyzed to minimize the risk of Type I and Type II errors.

Assumptions for a one-way ANCOVA: 1) The dependent variables were normally distributed in the population for the covariate and for one level of the factor. 2) Variance of the dependent variable for the distribution of assumption one was equal. 3) The cases represented a random sample from the population and scores were independent of each other. (This assumption was met in the design of the study.) 4) The covariate was linearly related to the dependent variable within all levels of the factor and slopes relating the covariate to the dependent variable were equal across all levels of the factor.

Results for question one. For the first question, ANCOVAs were conducted to test the null hypothesis that there are no statistically significant differences between groups on posttest performance for the Test of Phoneme Identities. The independent variable was *Group*, with two levels: the experimental PA group and the CAP control group. The dependent variable was TPI2, the preliminary posttest for phoneme awareness following instruction. The covariate pretest, TPI1, was used to control for pretest differences since it accounted for 24% of the variance between groups. The TPI1 was evaluated as a covariate with an independent samples *t* Test. There were no statistically significant differences on a two-tailed *t*-Test for TPI1, $t(32) = -0.29$,

meeting assumption one. Additionally, Levene's Test indicated no significant differences in the variance between groups for TPI2, $F(1,32) = .02$, $p = 0.9$ meeting assumption two. A preliminary analysis evaluated the homogeneity-of-slopes assumption and there were no statistically significant differences in the intercept indicating that the covariate TPI1 and the dependent variable TPI2 did not differ significantly as a function of the independent variable, Group: $F(1, 31) = 0.1$, $MSE = 6.27$, $p = 0.75$, $\eta^2 = .003$, meeting assumption four. ANCOVA results were significant for the dependent variable, TPI2: $F(1, 30) = 7.24$ MSE 6.27, $p = .012$, $\eta^2 = 0.19$. The strength of the relationship between the TPI2 and PA group was strong, accounting for 19% of the variance while holding constant pretest scores. Effect size for the PA treatment group was estimated to be 0.78 for the TPI2 results. Consequently the decision was made to reject the null hypothesis. There were statistically significant differences on posttest performance for children in the phoneme awareness intervention group compared to children in the print concepts group.

For the delayed posttest, two outliers were removed prior to the analysis. One child in the CAP group had attended kindergarten for three weeks and his performance from PTI2 to TPI3 increased by three standard deviations as a result of kindergarten instruction. The other child in the PA group was highly distracted, agitated, and uncooperative during the delayed posttests due to activities at the childcare center. He refused to participate midway through making results an unreliable measure of his knowledge.

Using TPI1 as a covariate, the ANCOVA indicated statistically significant differences between the groups: $F(1,28) = 6.4$, MSE = 3.06, $p = .017$, $\eta^2 = 0.19$, supporting sustained learning for the Test of Phoneme Identities. (See Table 2 for mean score comparisons.)

Table 2

Means and Standard Deviations of Dependent Variables

Measure (Variable)	PA Group (N=17) M (SD)		Cap Group (N=17) M (SD)	
Test of phoneme Identities				
Pretest (TPI1)	9.88	(4.01)	10.24	(3.09)
Posttest 1 (TPI2)	13.47*	(2.83)	11.29	(2.73)
Posttest 2 (TPI3)	13.50*	(3.86)	10.44	(3.63)
Phonetic Cue Reading				
Pretest (PCR1)	7.00	(3.41)	7.41	(3.06)
Posttest 1 (PCR2)	7.24	(1.95)	6.53	(2.35)
Posttest 2 (PCR3)	7.38*	(2.09)	5.06	(1.65)
Concepts About Print				
Pretest (CAP1)	12.18	(5.03)	11.76	(4.52)
Posttest 1 (CAP2)	15.12	(3.98)	18.47*	(4.40)
Posttest 2 (CAP3)	16.19	(3.35)	17.88	(3.63)

* Indicates significance at the .05 level of probability with step-down Holm-Bonferroni adjustment .05/6).

Results for Question Two. Question two tested the null hypothesis that there were no statistically significant differences between groups on an application measure that tested whether children understood how to use phoneme awareness to identify a word. The independent variable was Group and the dependent variable was PCR2. The covariate pretest, PCR1, was used to factor out any influence the test may have had on the PCR2 outcome. The pretest was at ceiling for 38% of the children so it was important to factor this pretest out. Levene's Test indicated no significant differences in the variance between groups for PCR1, $F(1,32) = .000$, $p = 0.98$, for PCR2, $F(1,32) = 0.64$, $p = 0.43$, or for PCR3 $F(1,30) = .06$, $p = 0.82$. A preliminary analysis evaluated the homogeneity-of-slopes assumption. The covariate PCR1 and the dependent variable PCR2 did not differ significantly as a function of the independent variable

Group, $F(1,30) = 2.75$, MSE = 3.88, $p = 0.11$, $\eta^2 = .08$. ANCOVA results were not significant for the dependent variable, PCR2, $F(1, 30) = 1.46$, MSE 3.88, $p = 0.24$.

For the delayed posttest, Levine's test showed no significant differences in error variance across groups, $F(1, 30) = .06$, $p = 0.82$. The covariate PCR1 and the dependent variable PCR3 did not differ significantly as a function of the independent variable *Group*, $F(1,30) = 3.2$, *MSE* = 3.3, $p = .09$, $\eta^2 = 0.10$. ANCOVA results were significant for the dependent variable, PCR3: $F(1, 28) = 13.6$, *MSE* 3.0, $p = .001$, $\eta^2 = 0.33$. The strength of the relationship between the PCR2 and PA group was strong, accounting for 33% of the variance while holding constant pretest scores. Effect size for the PA treatment group on the PCR3 was large at an estimated 1.24. The decision was to reject the null hypothesis. There were statistically significant differences on the delayed posttest performance for children in the phoneme awareness intervention group compared to children in the print concepts group for phonetic cue reading.

Results for Question Three. Question three proposed that there would be statistically significant differences between groups for performance on the print concepts measure. The independent group was paired with the covariate CAP1 to analyze effects on the dependent variable CAP2. Levene's Test indicated no significant differences in error variance across groups: CAP1, $F(1,32) = .002$, $p = 0.96$, CAP2, $F(1,32) = 2.73$, $p = 0.13$, and CAP3 $F(1,30) = 0.7$, $p = 0.41$. A preliminary analysis evaluated the homogeneity-of-slopes assumption. The covariate CAP1 and the dependent variable CAP2 did not differ significantly as a function of the independent variable Group, $F(1,30) = 0.23$, *MSE* = 10.85, $p = 0.64$, $\eta^2 = .008$. ANCOVA results were significant for the dependent variable, CAP2, $F(1, 30) = 10.07$, *MSE* 10.85, $p = .003$, $\eta^2 = 0.25$. The strength of the relationship between the CAP2 test and the CAP group was large,

accounting for 25% of the variance while holding constant the pretest score. Effect size for the control group on the CAP2 was large at an estimated 0.80.

For the delayed posttest, ANCOVA results did not indicate significant differences between groups for CAP3: $F(1,28) = 3.69$, $MSE = 9.9$, $p = .07$, $\eta^2 = 0.12$. However, the null hypothesis was rejected since there were statistically significant differences in the initial posttest performance for children in the CAP control group compared to children in the PA group for the print concepts measure. Possible reasons for changes in the PA group from posttest one to posttest two are discussed in chapter five. (See Table 3 for a list of dependent variables and factors in which statistically significant differences were found.)

Table 3

Dependent variables with significant levels of probability and effect sizes at 95% confidence level.

Measure	Level of Factor	*Covariate*	*p value*	Effect Size
Posttest 1 (TPI2)	PA Group	TPI1	*p = .012*	0.78
Posttest 2 (TPI3)	PA Group	TPI1	*p* = .017	0.83
Posttest 2 (PCR3)	PA Group	PCR1	*p* = .001	1.24
Posttest 1 (CAP2)	CAP Group	CAP1	*p* = .003	0.80

Results for Question Four. Question four departed from PA and CAP comparisons to examine the affect of age on test performance: To what extent do children differ in PA or CAP performance as a function of age? Children ranged in age from 45 months to 71 months. Several entered kindergarten before the study ended while several were awaiting their fourth birthdays. The question was worth exploring, since age often makes a big difference in performance during the early childhood years. A preliminary analysis indicated that the data did not meet several of the assumptions for linear regression. There was not a linear relationship between any of the dependent variables and age in months and there were a significant number of outliers in the data

distributed by age. Instead, correlations were computed among the six dependent variables. Using the Holm-Sequential Bonferroni approach ($p < .05/6$), all of the dependent measures showed moderate to large correlations across the entire group (See table 5 for correlations with age.) When age differences were looked at separately within the intervention groups, only three correlations could be identified. In the PA group, there was a large correlation between age and the print concepts immediate posttest $r(17) = 0.63$ $p = .007$. In the CAP group, there were large correlations between age and the immediate print concepts posttest $r(17) = 0.66$ $p = .004$ and the delayed phonetic cue reading posttest $r(16) = 0.77$ $p = .001$. The null was, therefore, partially retained since there were differences in group performance based on age for two different measures, concepts about print and phonetic cue reading (See Table 4 for means comparisons based on age within intervention groups).

Results for Question Five. My final question was drawn from the literature on teaching phoneme awareness. As reported by the NRP, excessive amounts of time did not improve scores, so I wondered if my directions to parents to read 15 to 20 minutes would be followed and which group would benefit the most, those who read too little, those who read too much, or those who simply stuck with the program. For this reason, it was referred to as the fidelity-to-treatment factor.

One-way ANOVAs were conducted for the three level factor on the nine independent variables reported in the study. No significant differences were found in the test of homogeneity of variances, indicating that groups were equal in variance; however, not all groups were evenly distributed. Only one measure indicated statistically significant differences. These were found in the phonetic cue reading pretest. Since the pretest was not an outcome of the intervention, no

further analyses were conducted. There were no statistically significant differences between compliance groups, therefore, the null hypothesis was retained.

Table 4

Means and Standard Deviations by Age in Months

Measure (Variable)	PA Group M (SD)		(N)	CAP Group M (SD)	
Age	57.59	(7.39)	N = 17	55.29	(6.30)
Test of phoneme Identities					
Pretest (TPI1)	9.88	(4.01)	N = 17	10.24	(3.09)
Posttest 1 (TPI2)	13.47	(2.83)	N = 17	11.29	(2.73)
Posttest 2 (TPI3)	13.50	(3.86)	N = 16	10.43	(3.63)
Phonetic Cue Reading					
Pretest (PCR1)	7.00	(3.41)	N = 17	7.41	(3.06)
Posttest 1 (PCR2)	7.23	(1.95)	N = 17	6.53	(2.35)
Posttest 2 (PCR3)	7.38*	(2.09)	N = 16	5.06	(1.65)
Concepts About Print					
Pretest (CAP1)	12.18	(5.03)	N = 17	11.76	(4.52)
Posttest 1 (CAP2)	15.12	(3.98)	N = 17	18.47*	(4.40)
Posttest 2 (CAP3)	16.19	(3.35)	N = 16	17.88	(3.63)

* Indicates correlation with age at $p < .008$

Table 5

Correlations among six dependent measures and age.

	Pearson-*r*	*p*	N
TPI Post1	.46	.007	34
TPI Post 2	.51	.003	32
PCR Post 1	.40	.02	34
PCR Post 2	.63	<.001	32
CAP Post 1	.52	.002	34
Cap Post 2	.43	.013	32

Note: Confidence levels based on step down Holm-Bonferroni adjustment (.05/6)

Observations and Qualitative Factors

After parents read to children each day, they completed a checklist form to give me an idea of how engaged and attentive children were during the lesson (refer to Figure 3). A comments section allowed for more personal feedback. Here parents often further explained the child's interests, moods, remarks, or personal issues:

> He can find the letter *f* at the start of a word but does not want to try to sound out words. We found a few other sounds as a review. He struggled with the plot of the *H* book. He did not understand a second haircut was a mistake or why the girl would be embarrassed by a haircut. (Subject #13037, personal narrative)

Figure 3 *Daily tracking form for PA group*

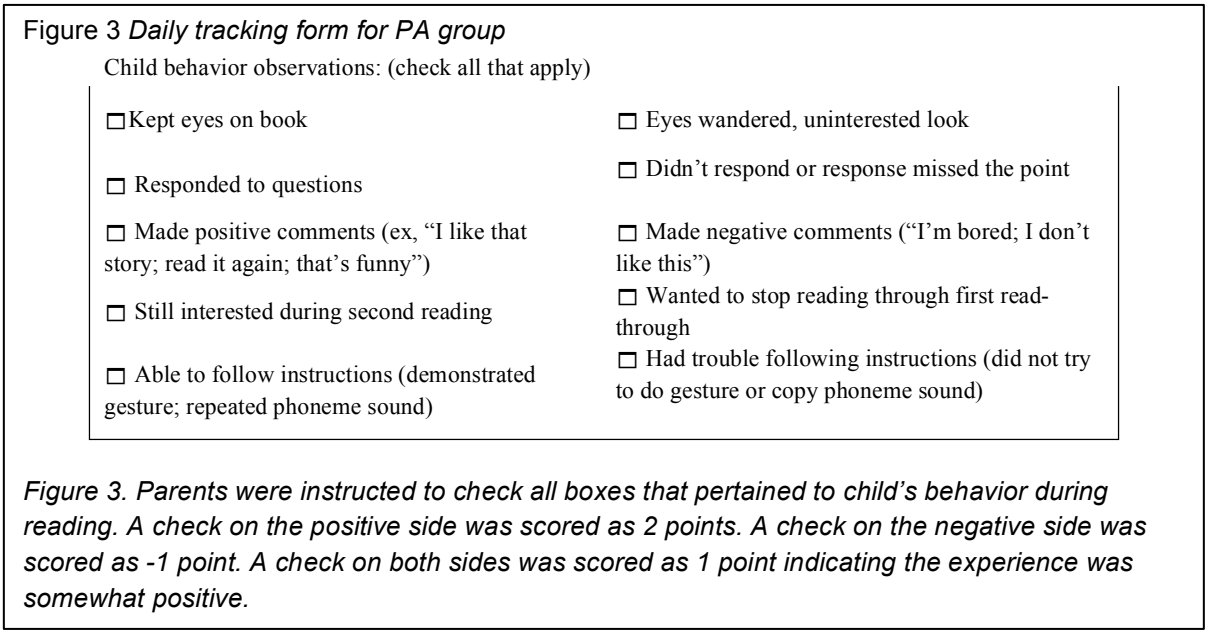

Figure 3. Parents were instructed to check all boxes that pertained to child's behavior during reading. A check on the positive side was scored as 2 points. A check on the negative side was scored as -1 point. A check on both sides was scored as 1 point indicating the experience was somewhat positive.

On review days, parents were asked to respond only to statements regarding eye contact, child comments, and following directions. A surprising 88% of parents used the forms to track at least some of the daily behavior. Two parents didn't notice them among the materials suggesting that they many not have watched the videos, while two simply lost them. Some followed

instructions for completing forms but many invented their own system. Because data was erratic and unreliable, no formal measures could be analyzed from the feedback forms. They did supply an interesting and entertaining picture of what went on during home lessons. It was also interesting to note that parents who spent a lot of time, as long as 45 minutes, provided a lot of comments about problems with instructions.

One CAP parent wrote:

> I think interrupting each page was tough on her the second time. She seems to be understanding the directionality a bit better. She gets antsy during the instructions during the second reading. Wanted to add that after the lesson was over, she was coloring. She made her letter the rooftop way, but during the lesson she resisted. (This is probably a parent-child thing. I could never homeschool.) The rooftop lines were confusing to her. Maybe different color lines would help. (Case #12604, May 20, 2013)

I also received feedback when I met with parents for follow-up assessments. One mother remarked to me that her daughter reminded her every evening that it was "time to do research." The children may not have understood what this meant, but they did understand that it was important to cooperate and try their best so that they could get stickers after completing lessons. Surprisingly, they were also cooperative during assessments and some asked me afterwards, "Did I get those right?"

Many parents reported that children enjoyed the stories and asked to have them read over and over. "He wanted to just read the story again without the learning material added (Subject #12604, June 3, 2013). "He wanted to read the story multiple times and complied with finding a few *B*'s and saying the sound but did not want to do the gesture. He is not interested in

examining the letters but he likes the stories (Subject #13037, June 19, 2013). “Today he said, ‘There's another book in there?’ with excitement. He pointed out *m*'s on the page, but often thought *w* was *m*. No gestures.” [A few days later:] “He started out with, ‘We get to read a new book?!’ Pointed to lots of *o*'s on the pages, but only pointed out one /o/ and said, "I only want to find one!” (Subject #10117, April 19, 2013).

I was particularly interested in these types of remarks, to see how children responded to the phoneme analogy cards (see Appendix C, Figure 1). Remarks were a blend of positives and negatives. “She loved the kitty claw, and enjoyed running in place for the second reading of the *H* book, but followed the plot of the story more than performing gestures of phoneme sounds (Subject # 12039, April 14, 2013).” “He loves the worksheets and we do all the extra reading, but he doesn't like the books. We also ran into some disagreements about the phonemes. For example babies don't say /a/ and cats don't say /f/. He did do the /b/ and we still do that phoneme. I think we only have the last two to do, but it hasn't been worth the battle. I will try again his weekend (Subject # 13323, August 13, 2013).” This parent told me the problem with liking the books was really more about not wanting to be interrupted while his father read Harry Potter books aloud to him. The *Tongue Tickler Tales* just couldn’t compete.

Some parents remarked that children expressed pride in their performance, especially when they remembered to do something in the review book that they had learned the day before. “Before we started reading the review book, he reminded me that we needed to look for B’s, and bang the drum (Subject # 11629, May 16, 2013). While others let me know when issues arose about the content. “She prefers to find letters but not other concepts. Still, she followed directions but said, ‘I'm getting tired with this period thingy.’ I increased sticker reinforcement for second reading and worksheet activities, which helped her stay on task. By the end of this

week she reminded me to do ‘our reading activities’ (Subject #10601, June 24, 2013).”

Many activities were included in the curriculum materials. Surprisingly, the worksheet activities that children did after instruction were well received. Parents made comments about children enjoying the coloring worksheets that helped them review phonemes or print concepts. Children with older siblings in school liked having homework when the study first began in the spring. Few parents commented on the writing practice, probably because I explained in the video that children should not be pressured to do the writing activity, especially if they were resistant. I especially emphasized that the story time was an informal learning time, and it should be enjoyable for both parent and child.

I entered data from checked categories on parent feedback forms into a spreadsheet and computed a positive feedback score for each of the categories parents responded to (refer to Table 6 for results).

Table 6

Positive Feedback from Qualitative Forms

Study Days	Positive Feedback
Eye contact on book while reading	83%
Responded to questions	91%
Verbal positive feedback from child	80%
Interest in second reading	74%
Followed directions	73%
Review Days	
Eye contact on book while reading	84%
Verbal positive feedback from child	85%
Followed directions	75%

Feedback showed a strong positive interest in overall reading experience using instructional conversations to teach children about phonemes or print concepts. (See sample checklists: Figure 4 in Appendix D, Figure 5 in Appendix E.)

Summary

This chapter detailed the results of the statistical analyses of data collected throughout the study. Statistically significant differences were found for four dependent variables. For the factor intervention group, children in the PA condition scored significantly better than children in the CAP condition on the immediate posttest of phoneme identities (p = .012) and the delayed posttest (p =.017) when controlling for pretest in a one-way analysis of covariance. Children in the PA group also scored significantly better than children in the CAP condition on the delayed test, but not on the immediate posttest for phonetic cue reading, (p = .001). This test was, in fact, the most difficult version of the three tests. A ceiling effect on the pretest warranted its use as a covariate. Children in the print concepts group (CAP) scored significantly better than children in the PA group but only on the immediate posttest (p = .003).

Age group differences could not be analyzed with ANCOVAs due to the wide range from 45-71 months. Pearson-*r c*orrelation coefficients were examined to identify the strength of the relationship between age and test performance. Older children in the PA group performed better on the immediate posttest for print concepts: $r(17) = 0.63$ p =.007. This was also the case for older children in the CAP group: $r(17) = 0.66$ p =.004. Older children in the CAP group also performed better on the delayed posttest for phonetic cue reading: $r(16) = 0.77$ p =.001; however, there were no differences based on age for TPI measures in either intervention group.

Parents provided a very positive response to the study, and reported that children also enjoyed participation. A large number of participants (88%) submitted feedback forms detailing

children's interests and problems. Parents were conscientious for the most part, about completing readings and reviewing, and children were generally cooperative throughout the study and during assessments.

CHAPTER 5

DISCUSSION

This study examined parents as instructors of preschool children for two fundamental literacy skills, phoneme awareness and print concepts. It also measured the transfer of phoneme awareness to a simple reading task called phonetic cue reading, where children used knowledge of the alphabet and phonemes associated with letters to identify simple words. Children who are able to apply phoneme-grapheme knowledge in a simple reading task show strong evidence of acquiring the alphabetic principle.

I designed the curriculum of the control group, print concepts, to help children understand the vocabulary of printed text and the function of print without focusing on the separate listening skill of phoneme awareness. This chapter provides a summary of the results, conclusions, implications, and limitations of this study. Finally, I will present recommendations for future research to further examine ways to help parents prepare children for literacy instruction.

Summary of Results

Statistically significant differences and large effect sizes were found for the following dependent variables for the factor *Group* in the PA condition. On the first posttest for the test of phoneme identities the probability that differences occurred by chance was $p = .012$, a statistically significant level of probability for a confidence level of 95% with the Holm-Bonferroni adjustment. The PA group performance on the delayed posttest when factoring out

the TPI1 pretest had a $p = .017$ level of probability that the differences were due to chance events. Additionally, on the delayed posttest for phonetic cue reading, the probability that the PA group scores differed from the CAP group scores as a matter of chance was $p = .001$ when factoring out the PCR1 pretest as a covariate.

In the CAP condition, there were statistically significant differences between groups for the immediate posttest for CAP2, $p = .003$, when factoring out the CAP pretest. For the factor *age group*, statistically significant differences and large correlations were found among older children on the CAP1 test in both conditions PA ($p = .012$) and CAP ($p = .017$). Additionally, older children in the CAP condition performed better on the delayed posttest for phonetic cue reading than did younger children in the CAP group or children in the PA group.

Null hypothesis one was rejected due to statistically significant differences between the PA and Control groups on both posttests for Phoneme Identities. Null hypothesis two was rejected due to statistically significant differences between groups on the delayed PCR posttest. Null hypothesis three was rejected due to statistically significant differences on the immediate CAP posttest. Null hypothesis four was partially retained due to statistically significant correlations between older and younger children on the immediate CAP posttests in both groups and on phonetic cue reading in the CAP group. Null hypothesis five was retained. There were no statistically significant differences between groups based on amount of instruction time reported by parents.

Discussion of Results

The literature supports teaching phoneme identities to preschool children. This study provides further evidence that young children are able to understand and apply PA knowledge, letter knowledge, and letter-sound knowledge to identify words with only minimal instruction

from parents. Even children with low letter recognition were able to demonstrate growth in literacy during the instructional period. Age was not a factor in acquiring PA; however, it did appear to be a factor in applying PA in a reading task for the untrained group. Additionally, amount of time parents devoted to teaching their children to understand the connection between print and speech was not a factor. While parents were not monitored for fidelity to treatment, they still were able to help children acquire phoneme awareness and begin to understand how PA was used in reading regardless of the amount of time spent reading and discussing phonemes.

Children's performance on the delayed posttest for phoneme identities also showed statistically significant differences between groups when controlling for pretest scores on the TPI. This was not the case before removing the data of two outlier cases. One child had three full weeks of kindergarten at the delayed posttest time and another child was uncooperative and agitated during posttests due to a party in the classroom where assessments were conducted. In three weeks time, I noticed that one child in the CAP condition who did the immediate posttest at the beginning of the first week of school did remarkably better by the third week of school when delayed post testing was scheduled. A second child in another school district showed no noticeable difference in his performance after two weeks of kindergarten on either the PA measures or the CAP measures, so his data was left in the analysis. A third child had completed a second week of kindergarten but indicated to me at test time that he had just learned one new letter and was far more interested in sharing his science experiences that week than talking about literacy. His delayed scores were not noticeably different from the immediate posttest scores so his data was also retained. The changes in the first child suggest that he was benefitting rapidly from initial phoneme awareness instruction occurring in the classroom at a rather rapid rate. In fact, he tried sounding out pseudowords during the delayed posttest, something he hadn't tried

before, and remembered all of the new short vowel sounds he had learned in the course of three weeks. PA is typically taught during the kindergarten year and this is a possible reason why the means of the CAP group increased on the delayed posttest while those in the PA group remained stable in the initial analysis. After removing the data from the two outliers, differences were only apparent in the PA group.

While the results were not used in the analysis of CAP and PA learning, paired samples *t*-Tests indicated that children in both groups improved in word learning on the vocabulary measure, another indicator of parent effectiveness in teaching. There were significant gains from pretest to posttest, $t(33) = -4.51$, $p < .001$, with a pretest mean of 14.97 and posttest mean of 17.03. Additionally, all children improved in letter recognition, a second shared instructional intervention, with some showing dramatic gains. One child recognized only four letters at pretest and 21 on the delayed posttest. His mother was surprised with these gains and with his change in attitude. The overall means increase in letter recognition was four letters, but the growth range was 0-17 letters.

Results from the analysis of CAP performance were as expected. The literature supports rapid growth in vocabulary for preschool children, especially children who are regularly read to, as was evident in this group of subjects. The delayed CAP changes showed a smaller mean score for the CAP group at the time of the second posttest and a slight gain for the PA group. Children in both groups learned print concepts, and this may be a result of parent conversation while reading, since parents in both groups actively spoke about the stories and spoke about what people do when they read. While doing assessments at preschools and childcare facilities, I also noticed that preschool story time was often devoted to pointing out features of the book the teacher was reading. Since all children participating in the study were also enrolled in

preschools, it is highly probable that CAP instruction was occurring for some children in both groups. On the other hand, more than half of the parents enrolled in the study decided to wait until summer to get started, when a number of preschools were closed. Consequently, no assumptions can be made about children's literacy experiences outside the home.

Results were of particular interest for age. It was not a factor for PA instruction but it was a factor for CAP measures, indicating that younger children may benefit from learning about phonemes just as well as older children do, but learning about print may not be meaningful. Parents reported that children understood most print concepts except for punctuation. Separate punctuation scores were collected but they were discarded since few children were able to identify most punctuation marks, and punctuation instruction is more appropriate for children who are already reading. A number of children in both groups knew about question marks, which some referred to as "mystery marks," but most didn't get beyond that. For children who confused letters with numbers on the letter-recognition test, adding more meaningless marks to their lexicon was more than they could handle. As one child put it, "I'm getting tired of this period thingy." Age did make a difference for phonetic cue reading. More children may have acquired PA in the PA training group, but it was not the case that they could use PA to identify words, especially when words started with the same beginning letters, as was the case with the PCR3 delayed posttest. Older children with PA did well on this test while younger children, in general, did not understand the task. It should be noted that recognizing beginning sounds in words is a task that is introduced in preschools that follow recommended standards for phonological awareness in the state where this study took place (DCA, 2012).

From a qualitative perspective, I drew several informal conclusions from parent remarks. Children generally enjoyed the reading time, most enjoyed the books, few liked the phoneme

gestures, but they enjoyed making phoneme sounds, looking for letters, and coloring afterwards. Parents enjoyed the opportunity to read with their children and appreciated the excitement of learning new things. One possible reason why the gestures may have been unpopular is that they are better suited to group activities, where children share a playful experience together and learn in unison, modeling and reinforcing the behavior. This study does not rule out the use of gestures, but it was apparent that they are not of much use for individualized instruction.

This brings us back to the theoretical foundation and ramifications of this study. The effectiveness of the phonological sensitivity model cannot be directly challenged by this study, because other than phoneme identity, children were not assessed for their ability to recognize syllables, rimes, onsets or larger structures such as words in speech. They were not taught to manipulate phonemes, and no group was given instruction that gradually led them to become sensitive to the phoneme, which would have necessitated a third group that first learned larger phonological structures prior to learning about phonemes. Instead, they were directly introduced to the identity of eight phonemes and taught to recognize them in speech by more than just listening. They heard the phoneme in multiple locations within words, and their attention was drawn to the production of phonemes. Evidence from pretests indicated that only three children had any type of phoneme awareness before the study but at posttest, half of the participants in the PA group had developed PA through the phoneme-first intervention and none of the children in the CAP group acquired PA. The results of this study, therefore, provide strong evidence that the phoneme-first model is an effective intervention for helping children develop PA.

Children in the PA group were introduced to phonemes with images and embedded letters to supply them with multiple cognitive links for easy recall. Dual-coding theory explains why they were able to make phoneme associations with letters and use them in a phonetic cue

reading task. The images and letters gave the phonemes meaning, making them more memorable. Spreading activation theory explains why they could recall the phoneme-letter connections readily and use them to identify words using newly built cognitive links. One little boy made this abundantly clear in the posttest when I showed him the word *LIST* and asked if it was *lift* or *list*. He looked at it for a moment and pointed to the letter *S* in the word. "It has to be *list* cause the *S* says /s/, like the snake." He also mentioned two other stories during the assessments to help him respond to my questions. Therefore, results from this study also provide evidence that an intervention that provides multiple cognitive links helps children make connections between letters and speech sounds.

Conclusions

Most of the hypotheses I proposed in this study were supported by evidence gathered from assessments. Parents were found to be good instructors for their children. Children in both groups learned what their parents taught them and many remembered the details of instruction even after a long absence from daily readings and discussions. Children who learned about phonemes and letter sound connections had an entirely different response at posttest time to my request to "see if you can read these pretend words." Rather than the pretest response, "I can't read," I watched in amazement as they made funny attempts to put what they knew about letters and sounds together to come up with an answer for me. Several children actually read pseudowords by the end of the study, something they could not do at pretest time. In fact, two children were excluded from participation because children who can read pseudowords understand the alphabetic principle.

The most important outcome of learning about PA or print concepts was that children became more interested and attentive to letters, the reading process, and active engagement while

reading. Additionally, parents expressed appreciation for getting to participate in the study and told me they learned quite a bit. As one parent told me, "I used to just read to my daughter, and now you have taught me how to read to her in a way that matters."

This study replicates the results that Byrne and Fielding-Barnsley (1990) had in their early study. Children not only learned to recognize target phonemes, but they transferred their understanding to untaught phonemes by identifying consonants and vowel sounds other than those taught. It also confirms the results of Cunningham (1990), who provided children with a rationale for learning about phonemes and also taught them how to apply their knowledge of phonemes in a reading task. However, in this dissertation study, older children seemed better able to comprehend the application task better than younger children.

Implications

Practical Implications. Middle class parents want to help their children become successful readers when they arrive in elementary school; and they can do much to prepare them for formal reading instruction. Getting parents involved in actively helping children to read would be beneficial to publishing companies who forget that parents are the primary educators of young children. Parents in this study also enjoyed participating in research. There is a ripe field of subjects willing to do their part to contribute to the knowledge base. Parents have a lot of insight to share with researchers, publishers, and teachers who are willing to invite them to share in the conversation of how to help children do well in school.

Educational Implications. If parents are able to present complex and abstract ideas to their young children without a formal teaching certificate, it is reasonable to conclude that childcare workers, preschool teachers, and other caregivers may be able to do the same. It does not take extensive training and many hours of professional development to learn how to interest

children in print, or talk about phonemes. The benefits of teaching preschool children about phonemes have lasting results as Byrne and Fielding-Barnsley (2000) learned in their follow up studies six years after teaching children a few phonemes. Such instruction had an impact on word identification and comprehension skills six years later.

Another implication is that storybook reading is a good vehicle for delivering many kinds of instruction. Children build their vocabulary, develop listening comprehension, and can develop strategies to help them with reading comprehension as they begin to read on their own. Because story-book reading is a meaningful and authentic activity, it is a natural vehicle for such instruction rather than instruction at the word level, removed from the context of reading. Additionally, this study suggests that some children can make a metacognitive shift, even in the context of a story, to think about the auditory nature of language.

Limitations

There were several environmental conditions in this study that could not be controlled and they may have affected outcomes. Young children are not always cooperative, even with parents; and parents reported that interest and engagement varied from day to day. Pretest and posttest settings were often full of distractions and even when they weren't, children wanted to converse rather than respond to assessment items. Some would jump up in the middle of an assessment to show me something, or tell me about something. Needless to say, it is very difficult to conduct assessments with young children. I had to do a lot of waiting and repetition of test questions to gently drawn them back to the task at hand in order to complete the assessments. Many children seemed unaffected by the noise and distractions around them at childcare centers and busy library play areas, however, assessment conditions were less than optimal for data collection.

Children who participated in the study were a diverse group ranging in age from three and a half years to five years. They had a variety of prior knowledge and literacy experiences that may have affected intervention outcomes. Three children completed the final posttest after beginning kindergarten, which may have affected their delayed posttest scores. Parents could not be monitored for fidelity to the treatment, but only report on the amount of time spent with children doing study activities. If a parent reported 50 minutes, it may have included reading, conversations, and coloring time. Some used the checklists provided to give detailed descriptions of what they did each day, while some completed only one of the four forms or none of the forms; therefore, it was difficult to ascertain how many books were read or how many activities were completed for each lesson. Two parents told me they only read half of the books and the children didn't want to go any further than that. Data were included in the study for these two cases (one from each treatment) because time spent reading was noted and posttests were completed. What all this implies is that it is difficult to conduct research with families of small children and feel confident about results, which is why there is probably not much reported in the literature.

Findings from this study cannot be generalized to all parents. The study was conducted to determine whether parents who typically help their children acquire other school readiness skills are able to also help children acquire phoneme awareness. The literature is clear that most low SES parents are not prepared to help their children acquire literacy skills. One published and another unpublished study conducted at Auburn University by doctoral students were unable to keep low-income parents engaged in participation (Warren, 2009; Henderson, 2005). Consequently, no significant differences between groups were found for parents as instructors of phoneme awareness. It is appropriate, however, for parents who have literacy skills and an

adequate education. Many such parents are concerned about their own children's delays or lack of skills. Several of the mothers in this study did harbor such concerns because of differences between older and younger sibling attitudes toward literacy. The parent of one child, in fact, who was not eligible to participate, requested a tutor because dyslexia was a condition among extended family. The tutor reported to me that after about four months of phoneme awareness instruction, this child is finally beginning to understand how to identify phonemes and their associated letters in words. He can only identify 11 phonemes and their corresponding letters, but he is beginning to pick up new phonemes more readily, now that he understands the concept of phoneme.

Recommendations for Future Research

More literacy research should be done with parents and young children as subjects. There are plentiful studies and surveys of what parents do with their children, but few experimental studies using parents to deliver literacy interventions, except within families who have a child with a documented disability. There is a need for research that uses parents to help children at risk of reading failure. Children at risk of reading failure fall into two categories, one that Stanovich (1988) describes as the *garden variety poor reader* and children with poor phonological processing skills who often develop a persistent, life-long reading disability. While garden variety poor readers typically come from poverty level homes, and lack opportunities to develop early language and literacy skills, children with reading disabilities are found in every socio-economic class. They are often characterized as highly intelligent and have clearly benefit from oral language development precipitated by early literacy experiences with their parents. If parents can be taught to intervene early on behalf of children with Down Syndrome (van

Bysterveldt, Gillon, & Moran), it is reasonable to assume that middle class parents can be empowered to help their preschool children at risk for reading disability.

We do not, however, know to what extent poverty level families can be trained to intervene. In an investigation of academically successful and unsuccessful elementary children, Chall and Snow (1982) found no noted correlation between low income parent's education levels, literacy levels, and time spent building literacy, with children's achievement. However, in Adam's review of the literature (1990), children who were frequently read to in the home were more likely to experience success in reading. More recently, the US Department of Education (2011) reported that children from low SES homes are significantly behind their middle class peers in literacy development upon entering school, a fact that has persisted in the literature for decades, suggesting that many low-income parents continue to be ill equipped to intervene and interventions are not occurring in low-income childcare centers. Such children have been shown to benefit from early literacy interventions in government sponsored preschool programs, and they often "catch up" to their middle class peers when literacy and cognitive skills are addressed in preschool (Landry, 2005).

Another population worth studying is children entering kindergarten who already read. When we can identify factors at work in skilled readers and early readers, we can create programs that are effective for non-readers. The link between phoneme awareness and early reading is particularly important, and these children may provide the research community with a clearer understanding of its role in early reading achievement.

We know the power of teaching children about phonemes, but that news hasn't made its way into homes. In all of the literature on phoneme awareness, there is also a lack of studies that compare teaching phoneme identities with other PA skills to initiate the alphabetic principle. We

don't know if children acquire phoneme manipulation skills because they are learning to read, or if such tasks are worthwhile before children can even recognize phonemes in spoken language (Stahl & Murray, 1994).

Since the research on reading disabilities implicates a lack of phoneme awareness as a huge factor in dyslexia (Vellutino, et al. 2004), further studies should address the significance of early instruction in phoneme identities in preschool to help children recognize phonemes in speech. Waiting until kindergarten and first grade when the stakes are high, and introducing phonemes in difficult manipulation tasks leaves children with phonological processing problems vulnerable to reading failure and all its negative effects.

REFERENCES

Abdullah-Welsh, N., John, F., & Bosma, J. (2009). *Technical report: Recommendations for future early childhood literacy research.* The Institute for Literacy and National Center for Family Literacy. Washington D.C.: WestEd. Retrieved from http://lincs.ed.gov/publications/pdf/ECL_Recommendation09.pdf

Adams, M.J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Adams, M.J., & Bruck, M. (1993). Word recognition: The interface of educational policies and scientific research. *Reading and Writing: An Interdisciplinary Journal, 5*(2), 113-139.

Alabama State Department of Education, ALSDE. (2010). *Alabama course of study: English language arts.* Alabama Department of Education. Retrieved from http://alex.state.al.us/browseEnglish.php

Alabama Department of Children's Affairs, DCA. (2012). *Alabama developmental standards for preschool children.* Office of School Readiness. Retrieved from http://children.alabama.gov/alabama-developmental-standards-for-preschool-children/

Ainsworth, S. (2006). Deft: A conceptual framework for considering learning with multiple representations. *Learning and Instruction, 16*(3), 183-198. doi: 10.1016/j.learninstruc.2006.03.001

Anderson, J.R. (1983). A spreading activation theory of memory. *Journal of Verbal Learning and Verbal Behavior, 22*(3), 261-295. doi: 10.1016/S0022-5371(83)90201-3

Anthony, J.L., Lonigan, C.J., Driscoll, K.Y., Phillips, B.M., & Burgess, S.R. (2003). Phonological sensitivity: A quasi-parallel progression of word structure units and cognitive operations *Reading Research Quarterly, 38*(4), 470-487.

Anthony, J. L., Williams, J.M., McDonald, R., & Francis, D.J. (2007). Phonological processing and emergent literacy in younger and older preschool children. *Annals of Dyslexia, 57,* 113-137.

Arnold, D.S., & Whitehurst, G.J. (1994). Accelerating language development through picture book reading. In Dickinson (Ed.), *Bridges to literacy: Approaches to supporting child and family literacy* (pp.103-128). Cambridge, MA: Blackwell.

Baker, L., Mackler, K., Sonnenschein, S., & Serpell, R. (2001). Parents' interactions with their first-grade children during storybook reading and relations with subsequent home reading activity and reading achievement. *Journal of School Psychology, 39,* 415-438.

Ball, W., & Blachman, B. (1991). Does phoneme segmentation training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly, 26*, 49-66.

Blachman, B. (1991). Phonological awareness: Implications for pre-reading and early reading instruction. In S. Brady and D. Shankweiler (Eds.), *Phonological processes in literacy: A tribute to Isabelle Y. Liberman* (pp. 119-124). Hillsdale, NJ: Lawrence Erlbaum Associates.

Blachman, B., Ball, E., Black, R., & Tangel, D. (1994) Kindergarten teachers develop phoneme awareness in low-income, inner-city classrooms: Does it make a difference? *Reading and Writing: An Interdisciplinary Journal (6),* 1-18.

Beck, I.L., McKeown, M.G., & Kucan, L. (2002). *Bringing words to life: Robust vocabulary instruction*. New York: Guilford.

Bergeron, J.P., Lederberg, A.R., Easterbrooks, S.R., Miller, E.M., & McDonald-Connor, C. (2009) Building the Alphabetic Principle in Young Children Who are Deaf or Hard of Hearing. *Volta Review, 109*(2-3), 87-119.

Bingham, G.E. (2007). Exploring the role of maternal literacy beliefs in mother child joint book reading and home literacy environments. *Early Education and Development, 18,* 23-50.

Blom-Hoffman, J., O'Neil-Pirozzi, T., Volpe, R., Cutting, J., & Bissinger, E. (2006). Instructing parents to use dialogic reading strategies with preschool children: Impact of a video-based training program on caregiver reading behaviors and children's related verbalizations. *Journal of Applied School Psychology, 23*(1), 117-131. doi: 10.1300/J370v23n01_06

Bond, G.L., & Dykstra, R. (1967). The cooperative research program in first-grade reading in instruction. *Reading Research Quarterly, 2*, 5-142.

Bradley, L., & Bryant, P.E. (1983). Categorizing sounds and learning to read: A causal connection. *Nature, 301*(5899), 419-421.

Bradley, L., & Bryant, P.E. (1985). *Rhyme and reason in reading and spelling*. Ann Arbor, MI:University of Michigan Press.

Bryant, P.E., Bradley, L., Maclean, M., & Crossland, J. (1990). Rhyme and alliteration, phoneme detection, and learning to read. *Developmental Psychology, 26,* 429-438.

Byrne, B. (1996). The learnability of the alphabetic principle: Children's initial hypotheses about how print represents spoken language. *Applied Psycholinguistics, 17*, 401-426.

Byrne, B., & Fielding-Barnsley, R. (1990). Acquiring the alphabetic principle: A case for teaching recognition of phoneme identity. *Journal of Educational Psychology, 82*, 805-812.

Byrne, B., & Fielding-Barnsley, R. (1991). Evaluation of a program to teach phonemic awareness to young children. *Journal of Educational Psychology, 83*, 451-455.

Byrne, B., & Fielding-Barnsley, R. (1993). Recognition of phoneme invariance by beginning readers: Confounding effects of global similarity. *Reading and Writing: An Interdisciplinary Journal, 5*, 315-324.

Byrne, B., & Fielding-Barnsley, R. (1995). Evaluation of a program to teach phonemic awareness to young children: A 2- and 3-year follow-up and a new preschool trial. *Journal of Educational Psychology, 87*, 488-503.

Byrne, B., Fielding-Barnsley, R., & Ashley, L. (2000). Effects of preschool phoneme identity training after six years: Outcome level distinguished from rate of response. *Journal of Educational Psychology, 92*, 659-667.

Bus, A.G., & Van Ijzendoorn, M.H. (1999). Phonological awareness and early reading: A meta-analysis of experimental training studies. *Journal of Educational Psychology, 91,* 403-414.

Campbell, D.T., & Stanley, J.C. (1966). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally.

Caravolas, M., & Landerl, K. (2010). The influences of syllable structure and reading ability on the development of phoneme awareness: A longitudinal, cross-linguistic study. *Scientific Studies of Reading, 14*(5), 464-484.

Carroll, J.M., Snowling, M.J., Hulme, C., & Stevenson, J. (2003). The development of phonological awareness in preschool children. *Developmental Psychology, 39*(5), 913-923.

Cassidy, J., & Grate-Garcia, S. (2013). Common core state standards top the 2014 what's hot what's not Survey. *Reading Today, 31*(1), 1, 12-16.

Castles, A., & Coltheart, M. (2004). Is there a causal link from phonological awareness to success in learning to read? *Cognition, 91*, 77–111.

Clay, M.M. (1972). *Sand: The concepts about print test*. Auckland, New Zealand: Heinemann Educational Books.

Cunningham, A.E. (1990). Explicit versus implicit instruction in phonemic awareness. *Journal of Experimental Child Psychology, 50*, 429-444.

Ehri, L.C. (1999). Phases of development in learning to read words. In J. Oakhill & R. Beard (Eds.), *Reading development and the teaching of reading: A psychological perspective* (pp. 79–108). Oxford: Blackwell Science.

Ehri, L.C., & Sweet, J. (1991). Fingerpoint-reading of memorized text: What enables beginners to process the print? *Reading Research Quarterly, 26*, 442-462.

Ehri, L.C., Deffner, N.D., & Wilce, L.S. (1984). Pictorial mnemonics for phonics. *Journal of Educational Psychology, 76*(5), 880-893.

Ehri, L., & Stahl, S.A. (2001). Beyond the smoke and mirrors: Putting out the fire. *Phi Delta Kappan, 83*, 17-20.

Ferreiro, E., & Teberoski, A. (1982). *Literacy before schooling.* . Portsmouth, NY: Heinnemann.

Fraser, Jill, Goswami, Usha, & Conti-Ramsden, Gina. (2010). Dyslexia and Specific Language Impairment: The Role of Phonology and Auditory Processing. *Scientific Studies of Reading, 14*(1), 8-29. doi: 10.1080/10888430903242068

Gleitman, L.R., & Rozin, P. (1973). Teaching reading by use of a syllabary. *Reading Research Quarterly, 8*(4), 447-483.

Gleitman, L. R., & Rozin, P. (1977). The structure and acquisition of reading I: Relations between orthographies and the structure of language. In A. Reber & D. Scarborough (Eds.), *Toward a psychology of reading* (pp. 55-141). Hillsdale, NJ: Erlbaum.

Goh, S., Yamauchi, L., & Ratliffe, K. (2012). Educators' perspectives on instructional conversations in preschool settings. *Early Childhood Education Journal, 40*(5), 305-314. doi: 10.1007/s10643-012-0518-9

Gough, P.B., & Tunmer, W.E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6-10.

Green, S.B., & Salkind, N.J. (2008). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (5th ed.). Upper Saddle River, New Jersey: Pearson.

Haney, M., & Hill, J. (2004). Relationships between parent-teaching activities and emergent literacy in preschool children. *Early Child Development and Care, 174*(3), 215-228. doi: 10.1080/0300443032000153543

Hesketh, A., Dima, E., & Nelson, V. (2007). Teaching phoneme awareness to pre-literate children with speech disorder: A randomised controlled trial. *Internatioal Journal of Language Communication Disorders, 42*, 251-271. doi: 10.1080/13682820600940141

Harrison, K. (2012) *Stella's story.* Fully Feline. Retrieved from http://fullyfeline.com/2012/08/cat-psychology-stellas-story/

Hohn, W.E., & Ehri, L.C. (1983). Do alphabet letters help prereaders acquire phonemic segmentation skill? *Journal of Educational Psychology, 75*, 752-762.

Johns, J. (2010). *Basic reading inventory: Preprimer through grade twelve and early literacy assessments.* Dubuque, IA: Kendall Hunt.

Juel, C., Griffith, P.L., & Gough, P.B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. *Journal of Educational Psychology, 78*(4), 243-255.

Justice, L.M., Bowles, R.P., & Skibbe, L.E. (2006). Measuring preschool attainment of print-concept knowledge: A study of typical and at-risk 3- to 5-year-old children using item response theory. *Language, Speech & Hearing Services in Schools, 37*(3), 224-235.

Justice, L. M., Invernizzi, M. A., Geller, K., Sullivan, A., & Welsch, J. (2005). Descriptive-developmental performance of at-risk preschoolers on early literacy tasks: Associations with age, race, and gender. *Reading Psychology, 26*, 1-25.

Justice, L.M., Skibbe, L.E., McGinty, A.S., Piasta, S.B., & Petrill, S. (2011). Feasibility, efficacy, and social validity of home-based storybook reading intervention for children with language impairment. *Journal of Speech, Language & Hearing Research, 54*(2), 523-538. doi: 10.1044/1092-4388(2010/09-0151)

Kaminski, R.A., & Good, R.H., III. (1998). Assessing early literacy skills in a problem-solving model: Dynamic indicators of basic early literacy skills. In M.R. Shinn (Ed.), *Advanced applications of curriculum-based measurement* (PP. 113-142). New York: Guilford Press.

Lachner, W., Zevenbergen, A., & Zevenbergen, J. (2008). Parent and child references to letters during alphabet book reading: Relations to child age and letter name knowledge. *Early Education & Development, 19*(4), 541-559. doi: 10.1080/10409280802230981

Landry, S. H., Swank, P. R., Smith, K. E., Assel, M. A., & Gunnewig, S. B. (2006). Enhancing early literacy skills for preschool children: Bringing a professional development model to scale. *Journal of Learning Disabilities, 39*(4), 306–324.

Liberman, I.Y., & Liberman, A.M. (1992). Whole language versus code emphasis: Underlying assumptions and their implications for reading instruction. In P. B. Gough, L. C. Ehri & R. Treiman (Eds.), *Reading acquisition* (pp. 343-366). Hillsdale, NJ: Erlbaum.

Liberman, I.Y., Shankweiler, D.P., Fischer, F.W., & Carter. B. (1974). Explicit syllable and phoneme segmentation in the young child. *Journal of Experimental Child Psychology, 18,* 201-212.

Lundberg, I. Frost, J., Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly, 23*(3), 263-284.

Lundberg, I., Olofsson, A., & Wall, S. (1980). Reading and spelling skills in the first school years predicted from phonemic awareness skills in kindergarten. *Scandinavian Journal of Psychology, 21*, 159-173.

Marsh, G., & Desberg, P. (1978). Mnemonics for phonics. *Contemporary Educational Psychology, 3*, 57–61.

Maclean, M., Bryant, P., & Bradley, L. (1987). Rhyes, nursery rhymes, and reading in early childhood. *Merrill-Palmer Quarterly*, 33, 255-281.

Martin, M.E., & Byrne, B. (2002). Teaching children to recognise rhyme does not directly promote phonemic awareness. *British Journal of Educational Psychology, 72*, 561-572.

Masonheimer, P., Drum, P., & Ehri, L.C. (1984). Does environmental print identification lead children into word reading? *Journal of Reading Behavior, 16*(257-272).

Mesmer, H.A.E., & Lake, K. (2010). The role of syllable awareness and syllable-controlled text in the development of finger-point reading. *Reading Psychology, 31*(2), 176-201. doi: 10.1080/02702710902754341

Murray, B.A. (1998). Gaining alphabetic insight: Is phoneme manipulation skill or identity knowledge causal? *Journal of Educational Psychology, 90*, 461-475.

Murray, B.A. (2006). Hunting the elusive phoneme: A phoneme-direct model for learning phoneme awareness. In K. A. Dougherty Stahl & M. C. McKenna (Eds.), *Reading research at work: Foundations of effective practice.* (pp. 114-125): Guilford Press.

Murray, B.A. (2010). More phon-let Pictures: Professional illustrations of short vowels. *The Reading Genie.* Retreived from http://www.auburn.edu/academic/education/reading_genie/phonlet2.html

Murray, B.A., Smith, K.A., & Murray, G.G. (2000). The test of phoneme identities: Predicting alphabetic insight in prealphabetic readers. *Journal of Literacy Research, 32*, 421-447.

Muter, V., Hulme, C., Snowling, M., & Taylor, S. (1997). Segmentation, not rhyming, predicts early progress in leaming to read. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 35*, 293-310.

National Institute of Child Health and Human Development. (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, DC: National Institute of Child Health and Human Development.

National Institute of Child Health and Human Development. (2005). Pathways to reading: The role of oral language in the transition to reading. *Developmental Psychology, 41*(2), 428-442. doi: 10.1037/0012-1649.41.2.428

O'Connor, R.E., Jenkins, J.R., Slocum, T.A. (1995). Transfer among phonological tasks in kindergarten: Essential instructional content. *Journal of Educational Psychology, 87*(2), 202-217. doi: 10.1037//0022-0663.87.2.202

O'Donnell, K. & Mulligan, G., & National Center for Education Statistics. (2008). *Parents' reports of the school readiness of young children from the National Household Education Surveys Program of 2007.* Washington, D.C.: National Center for Education Statistics, Institute of Education Sciences.

Perfetti, C.A. (1985). *Reading ability.* New York: Oxford University Press.

Phillips, L.M., Norris, S.P., & Anderson, J. (2008). Unlocking the door: Is parents' reading to children the key to early literacy development? *Canadian Psychology, 49*(2), 82-88. doi: 10.1037/0708-5591.49.2.82

Piasta, Shayne B. , & Wagner, Richard K. . (2010). Developing early literacy skills: A metaanalysis of alphabet learning and instruction. *Reading Research Quarterly, 45*(1), 8-38. doi: 10.1598/RRQ.45.1.2

Roberts, T.A. (2003). Effects of alphabet-letter instruction on young children's word recognition. *Journal of Educational Psychology, 95*(1), 41-51.

Rosner, J. (1974). Auditory analysis training with prereaders. *The Reading Teacher, 27*, 379-384.

Sadoski, M., & Paivio, A. (2007). Toward a unified theory of reading. *Scientific Studies of Reading, 11*(4), 337-356. doi:10.1080/10888430701530714

Scarborough, H., & Dobrich, W. (1994). On the efficacy of reading to preschoolers. *Developmental Review, 14,* 245–302.

Sénéchal, M., & LeFevre, J.-A. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development, 73*(2), 445.

Serpell, R., Sonnenschein, S., Baker, L., & Ganapathy, H. (2002). Intimate culture of families in the early socialization of literacy. *Journal of Family Psychology, 16*(4), 391-405.

Shamir, A., & Shlafer, I. (2011). E-books effectiveness in promoting phonological awareness and concept about print: A comparison between children at risk for learning disabilities and typically developing kindergarteners. *Computers & Education, 57*(3), 1989-1997. doi: 10.1016/j.compedu.2011.05.001

Shmidman, A., & Ehri, L. (2010). Embedded picture mnemonics to learn letters. *Scientific Studies of Reading, 14*(2), 159-182. doi:10.1080/10888430903117492

Siegel, L. (1993). Amazing new discovery: Piaget was wrong! *Canadian Psychology, 34*(3), 239-245.

Stahl, S.A., & Murray, B.A. (1994). Defining phonological awareness and its relationship to early reading. *Journal of Educational Psychology, 86*, 221-234.

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*, 360-406.

Stanovich, K.E. (1988). *Children's reading and the development of phonological awareness*. Detroit: Wayne State University Press.

Stanovich, K.E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York: Guilford.

Stanovich, K.E., Cunningham, A.E., & Cramer, B.B. (1984). Assessing phonological awareness in kindergarten children: Issues of task comparability. *Journal of Experimental Child Psychology, 38*(2), 175-190.

Stanovich, K.E., Nathan, R.G., West, R.F., & Yala-Rossi, M. (1985). Children's word recognition in context: Spreading activation, expectancy, and modularity. *Child Development, 56*, 1418-1428.

Stephenson, K.A., Parrila, R.K., & Georgiou, G.K. (2008). Effects of home literacy, parents' beliefs, and children's task-focused behavior on emergent literacy and word reading skills. *Scientific Studies of Reading, 12*(1), 24-50.

Storch, S.A., & Whitehurst, G.J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal model. *Developmental Psychology, 38*, 934-947.

Strickland, D., & Schickedanz, J. (2004). *Learning about print in preschool: Working with letters, words, and the beginning links with phonemic awareness.* Newak, DE: International Reading Association.

Tangel, D.M., & Blachman, B.A (1992). Effect of phoneme awareness instruction on kindergarten children's invented spelling. *Journal of Reading Behavior, 24,* 233-261.

Tangel, D.M., & Blachman, B.A., (1995). Effect of phoneme awareness instruction on the invented spelling of first-grade children: A one-year follow-up. *Journal of Reading Behavior, 27*(2), 153-185.

Torgesen, J.K. (2000). Individual differences in response to early interventions in reading: The lingering problem of. *Learning Disabilities Research & Practice (Lawrence Erlbaum), 15*(1), 55.

Torgesen, J.K., & Bryant, B.R. (1994). *Test of phonological awareness.* Austin, TX: Pro-Ed.

Treiman, R., & Kessler, B. (2003). The role of letter names in the acquisition of literacy. In R. Kail (Ed.), *Advances in Child Development and Behavior, 31* (pp.105-135). San Diego: Academic Press.

Treiman, R., & Tincoff, R. (1997). The fragility of the alphabetic principle: Children's knowledge of letter names can cause them to spell syllabically rather than alphabetically. *Journal of Experimental Child Psychology, 64*(3), 425-451.

Treiman, R., & Weatherston, S. (1992). Effects of linguistic structure on children's ability to isolate initial consonants. *Journal of Educational Psychology, 84*(2), 174-181.

Treiman, R., & Zukowski, A. (1991). Levels of phonological awareness. In S. A. Brady & D. P. Shankweiler (Eds.), *Phonological processes in literacy: A tribute to Isabelle Y. Liberman* (pp. 67-83). Hillsdale, NJ: Erlbaum.

Treiman, R., Tincoff, R., & Richmond-Welty, E.D. (1996). Letter names help children to connect print and speech. *Educational Psychology, 32*(3), 505-514.

Treiman, R., Weatherston, S., & Berch, D. (1994). The role of letter names in children's learning of phoneme-grapheme relations. *Applied Psycholinguistics, 15*(1), 97-122.

Treiman, R., Tincoff, R., Rodriguez, K., Mouzaki, A., & Francis, D. J. (1998). The foundations of literacy: Learning the sounds of letters. *Child Development, 69,* 1524-1540.

Ukrainetz, T.A., Cooney, M.H., Dyer, S.K., Kysar, A.J., & Harris, T.J. (2000). An investigation into teaching phonemic awareness through shared reading and writing. *Early Childhood Research Quarterly, 15*(3), 331-355. doi: http://dx.doi.org/10.1016/S0885-2006(00)00070-3

van Bysterveldt, A.K., Gillon, G.T., & Moran, C. (2006). Enhancing phonological awareness and letter knowledge in preschool children with down syndrome. *International Journal of Disability, Development & Education, 53*(3), 301-329. doi: 10.1080/10349120600847706

van Kleeck, A. (2003). Research on book sharing: Another critical look. In A. van Kleeck, S. A. Stahl & E. B. Bauer (Eds.), *On reading books to children: Parents and teachers*. (pp. 16-36). Mahwah, NJ: Erlbaum.

Vellutino, F.R., Fletcher, J.M., Snowling, M.J., & Scanlon, D.M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? *Journal of Child Psychologyy and Psychiatry, 45*(1), 2-40.

Vellutino, F.R., & Scanlon, D.M. (1987). Phonological coding, phonological awareness, and reading ability: Evidence from a longitudinal and experimental study. *Merrill-Palmer Quarterly, 33*(3), 321-363.

Warren, P. (2009). *The effects of training parents in teaching phonemic awareness on the phonemic awareness and early reading of struggling readers.* (Doctoral dissetation). Retrieved from AUETD. 10415/1807

Wechsler, D. (1974). *Manual for the Wechsler Intelligence Scale for Children—Revised*. New York: Psychological Corporation.

Windfuhr, K.L., & Snowling, M.J. (2001). The relationship between paired associate learning and phonological skills in normally developing. *Journal of Experimental Child Psychology, 80*(2), 160.

Yeh, S.S., & Connell, D.B. (2008). Effects of rhyming, vocabulary and phonemic awareness instruction on phoneme awareness. *Journal of Research in Reading, 31*(2), 243-256.

Yopp, H.K. (1988). The validity and reliability of phonemic awareness tests. *Reading Research Quarterly, 23*, 159-177.

Yopp, H.K. (1995). A test for assessing phonemic awareness in young children. *The Reading Teacher, 49*, 20-29.

Ziegler, J.C., & Goswami, U. (2005). Reading acquisition, developmental dyslexia, and skilled reading across languages: A psycholinguistic grain size theory. *Psychological Bulletin of the American Psychological Association, 131*(1), 3–29. doi: 10.1037/0033-2909.131.1.3

APPENDIX A

Generic Letter: Permission to Participate

Video Release Form

Permission to Recruit and Assess

Please Print on Stationary

September 21, 2012

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849
Dear IRB Members,

After reviewing the proposed study, "Helping preschool children acquire the alphabetic principle through parent training and intervention," presented by Mrs. Geralyn Murray, a graduate student at Auburn University, I have granted permission for portions of the study to be conducted at [Childcare Center Name].

The purpose of the study is to determine if parents can help their preschool children develop important preliteracy skills during storybook reading in the home. The primary activity will be conducted by parents in their homes while [Childcare Center Name] will be used for distributing materials and assessment of children's progress during the study at parent's request. Only children ages 3 – 5 are eligible to participate.

I understand that assessments will be conducted for each participating child. This event will occur *three times* over a period of two months, with testing lasting from 15 to 30 minutes. Mrs. Murray will *contact* and *recruit* parents and will *collect data* at [Childcare Center Name].

I understand that Mrs. Murray will receive parental/guardian consent for all participants, and have confirmed that she has the cooperation of classroom teachers. Mrs. Murray has agreed to provide to my office a copy of all Auburn University IRB-approved, stamped consent documents before she recruits participants at the center. Any data collected by Mrs. Murray will be kept confidential and will be stored in a locked filing cabinet in her AU advisor's office. Mrs. Murray has also agreed to provide to us a copy of the aggregate results from this study.

If the IRB has any concerns about the permission being granted by this letter, please contact me at the phone number listed below.

Sincerely,

Director [Childcare Center Name]
[Phone number]

Video Release Form

VIDEO RELEASE - MINOR

During your child's participation in this research study, "_____", your child will be videotaped. Your signature on the Informed Consent gives us permission to do so.

Your signature on this document gives us permission to use the videotape(s) for the additional purposes of (*publication, training, etc...*)beyond the immediate needs of this study. These videotapes will not be destroyed at the end of this research but will be retained (*indefinitely, for ____ months, years, etc....*).

Your permission:

I give my permission for videotapes produced in the study , Helping Preschool Children **"_____", which contain images of my child, to be used for the purposes listed above, and to also be retained (*indefinitely, for ____ months, years, etc....*).**

Maureen Fain 1-20-13 / Geralyn Murray
Parent/Guardian's Signature Date / Investigator's Signature Date

Maureen Fain / Geralyn Murray 1/20/13
Parent/Guardian's Printed Name / Investigator's Printed Name

PHELPS 1/20/13
Minor's Signature Date

Phelps Fain
Minor's Printed Name

APPENDIX B

Parent Permission Form for Child to Participate in the Study

Informed Consent Form for Parents to Participate in the Study

Recruitment Flyer

Parental Permission Form for Child Participation

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION
CURRICULUM AND TEACHING

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

PARENTAL PERMISSION/CONSENT
for a Research Study entitled
"Helping Preschool Children Acquire the Alphabetic Principle Through Parent Training and Intervention"

Your child is invited to participate in a research study that examines the effectiveness of a program of early intervention, designed to prepare children for later formal reading instruction in kindergarten and grade one. The study is being conducted by Mrs. Geralyn Murray, doctoral candidate, under the direction of Dr. Edna Brabham in the Auburn University Department of Curriculum and Teaching. Your child was selected as a possible participant because he or she is a pre-kindergarten child between the ages of 3 and 5. Your child may be excluded from the study following a screening assessment if it is determined that your child can read three or more words from a kindergarten word list, or one made up word, indicating he or she can decode. Since your child is under the age of 18 we must have your permission to include him/her in the study.

What will be involved if your child participates? If you decide to allow your child to participate in this research study, your child will be asked to participate in some pretest and posttest assessments of literacy as well as instruction which you will deliver. Your child's total time commitment will be approximately 10 hours.

Are there any risks or discomforts? The risk associated with participating in this study is the discomfort of working with a stranger for pretests and posttests. To minimize this risk, I will conduct assessments in a place where you have agreed that your child is most comfortable, whether this be in the home, a public setting such as the city library, or your child's daycare center.

Are there any benefits to your child or others? If your child participates in this study, your child can expect to learn some important pre-reading skills; however, I cannot promise you that your child will receive any or all of the benefits described.

Parent/Guardian Initials_____

5040 HALEY CENTER
AUBURN, AL 36849-5212

TELEPHONE:
334-844-4434

FAX:
334-844-6789

www.auburn.edu

If you (or your child) change your mind about your child's participation, your child can be withdrawn from the study at any time. Your child's participation is completely voluntary. If you choose to withdraw your child, your child's data can be withdrawn as long as it is identifiable. Your decision about whether or not to allow your child to participate or to stop participating will not jeopardize your or your child's future relations with Auburn University, the Department of Curriculum and Teaching, or the College of Education.

Your child's privacy will be protected. Any information obtained in connection with this study will remain *anonymous or confidential*. The data collected will be protected by keeping it in a database that is password protected and any paper-files will be secured in a locked office in the Department of Curriculum and Teaching. Information obtained through your child's participation may be used anonymously to fulfill an educational requirement, published in a professional journal, or presented at a professional meeting.

If you (or your child) have questions about this study, *please ask them now or* contact _____ at _____ or _____ at _____. A copy of this document will be given to you to keep.

If you have questions about your child's rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH FOR YOUR CHILD TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO ALLOW YOUR CHILD TO PARTICIPATE.

_____	_____	_____
Parent/Guardian Signature	Investigator obtaining consent	Date
_____	_____	_____
Printed Name	Printed Name	Date

Child's name _____

_____	_____
Co-Investigator	Date

_____
Printed Name

Informed Consent for Parent to Participate in Study

AUBURN UNIVERSITY

COLLEGE OF EDUCATION

CURRICULUM AND TEACHING

5040 HALEY CENTER

AUBURN, AL 36849-5212

TELEPHONE:

334-844-4434

FAX:

334-844-6789

www.auburn.edu

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT

for a Research Study entitled:

"Helping preschool children acquire the alphabetic principle through parent training and intervention"

You are invited to participate in a research study to learn how to prepare your preschool child for reading instruction. The study is being conducted by Geralyn Murray, M.Ed. under the direction of Dr. Edna Brabham in the Auburn University Department of Curriculum and Teaching. You were selected as a possible participant because you are the parent of a preschool child of 3 to 5 years, not yet enrolled in kindergarten, and you are age 19 or older. You and your child may be excluded from participation if screening assessments determine that your child can already read.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to read selected stories with your child twice a week and follow a script to help your child learn a valuable pre-reading skill. Your total time commitment will be approximately 1.5–2 hours per week for four weeks, preceded by a 15-30 minute assessment session to see what your child already knows after which you will be provided with materials for the study. After four weeks of lessons, I will meet with your child to administer a posttest and a second delayed posttest two weeks later to measure results. Posttest time will take 15-30 minutes for each.

Are there any risks or discomforts? The risk associated with participating in this study is a possible breach of confidentiality. To minimize this risk, we will code all data collection forms and store data by code rather than by subject name. Original documents providing contact information will be stored in a locked file cabinet in the Dept. of Curriculum and Teaching and shredded after three years. Coded data will be stored in a password protected computer file.

Are there any benefits to yourself or others? If you participate in this study, you can expect to provide your child with instruction to develop research-based skills to prepare him or her for the difficult task of learning to read at no cost to you; and you may enhance your understanding of what children need to become successful readers. However, I cannot promise you that you will receive any or all of the benefits described.

Will you receive compensation for participating? To thank you for your time, you will be provided with all the instructional materials used in the study to keep.

Participant's initials _____

If you (or your child) change your mind about your child's participation, your child can be withdrawn from the study at any time. Your child's participation is completely voluntary. If you choose to withdraw your child, your child's data can be withdrawn as long as it is identifiable. Your decision about whether or not to allow your child to participate or to stop participating will not jeopardize your or your child's future relations with Auburn University, the Department of Curriculum and Teaching, or the College of Education.

Your child's privacy will be protected. Any information obtained in connection with this study will remain *anonymous or confidential.* The data collected will be protected by keeping it in a database that is password protected and any paper-files will be secured in a locked office in the Department of Curriculum and Teaching. Information obtained through your child's participation may be used anonymously to fulfill an educational requirement, published in a professional journal, or presented at a professional meeting.

If you (or your child) have questions about this study, *please ask them now or* contact _____ at _____ or _____ at _____. A copy of this document will be given to you to keep.

If you have questions about your child's rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH FOR YOUR CHILD TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO ALLOW YOUR CHILD TO PARTICIPATE.

_____	_____	_____
Parent/Guardian Signature	Investigator obtaining consent	Date
_____	_____	_____
Printed Name	Printed Name	Date

Child's name _____

_____	_____
Co-Investigator	Date

_____
Printed Name

Recruitment Flyer

The Auburn University Institutional Review Board has approved this document for use from 10/7/12 to 10/6/13 Protocol # 12-322 EP 1210

Call for Participation in Preschool Parent Study

Preschool reading experiences play a tremendous role in preparing children for school, especially reading experiences in the home. As a parent, you make a major contribution to your child's literacy development through reading aloud. This study is an opportunity for you to enhance your child's literacy experiences by learning how to provide informal instruction in pre-literacy skills during storybook reading. Eligible participants are preschool children who cannot read, between the ages of 3 and 5, who are not enrolled in kindergarten.

Benefits of the study:

- You will learn how to engage your child's attention to print through story conversation.
- You will receive free training and instructional materials.
- Materials are appropriate in length and content for young preschool children.
- Your participation is based on your time frame, not mine.
- Your child will be taught valuable, research-based pre-literacy skills, highlighted by the National Reading Panel and the Early Childhood Literacy subcommittee for the National Institute for Literacy

What I will ask of you:

- Simply read to your child twice a week from the materials provided (about 15 minutes each day over a period of 4 weeks).
- Watch the DVD for instructions before reading, and to view a model of how to derive the most benefits during your reading time.
- Briefly review key concepts with your child on non-reading days (10-15 minutes)
- I will collect demographic information about you, and will need to assess your child's prior knowledge before the study, followed by assessments on your child's learning after the study (30 minute sessions at a location of your choice).

For questions about the study contact Geri Murray: Cell #334-275-1003 or e-mail me at murrag1@auburn.edu

murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003 murrag1@auburn.edu 334-275-1003

APPENDIX C

Data Forms and Assessments

Data Collection Forms

Information Form for Demographics

Assigned Code # _____

Study in Early Literacy

Geralyn Murray, M.Ed., Doctoral Candidate in Reading Education
Auburn University

Participant Information Form

Parent Name(s) _____
Address: _____

_____

Phone number where I can best reach you: _____
Best time range in which to call: _____
E-mail: _____
Child Name: _____
Child Birthday: _____

Which best describes your family annual household earnings?
□ Less than $30,000 □ $30,000 – 99,999 □ $100,000-250,000 □ $250,000 +

How often does your child hear stories read aloud?
□ 1-3 times per month □ once or twice per week □ 3 -5 times per week □ daily

Would you be willing to participate in a follow-up assessment when your child is in first grade? This would involve a set of assessments similar to the ones in this study, to see if this early intervention had any impact on future reading ability. Yes_____ No _____

All information collected here remains strictly confidential and will not be shared with anyone other than myself and my dissertation committee at Auburn University.

Qualitative Data Forms

Figure 4: Sample Data Form for Experimental Condition.

Code # _____

Week # 1	How long did you read? 20 minutes	Date of Review	How long did you review? 20 min.
Day 1 date: 5/13/13	Time: 6:30 pm	Day 2 Date: 5/16/13	Time: 6:30 pm
Child behavior observations: (check all that apply) ☑ Kept eyes on book ☑ Responded to questions ☑ Made positive comments (ex, "I like that story; read it again; that's funny") ☑ Still interested during second reading ☑ Able to follow instructions (demonstrated gesture; repeated phoneme sound) ☐ Eyes wandered, uninterested look ☐ Didn't respond or response missed the point ☐ Made negative comments ("I'm bored; I don't like this") ☐ Wanted to stop reading through first read-through ☐ Had trouble following instructions (did not try to do gesture or copy phoneme sound)		Child behavior observations: (check all that apply) ☑ Kept eyes on book ☑ Made positive comments ("I like that story; read it again; that's funny") ☑ Able to follow instructions (demonstrated gesture; repeated phoneme letter sound) ☐ Eyes wandered, uninterested look ☐ Made negative comments ("I'm bored; I don't like this") ☐ Had trouble following instructions (did not try to do gesture or copy phoneme sound)	
Additional Comments: He was very excited to read the story.		Additional Comments: He liked going over the cards.	
Week # 2	How long did you read? 15 minutes	Date of Review	How long did you review? 20 min
Day 3 date: 5/20/13	Time: 6:30 pm	Day 4 Date: 5/23/13	Time: 6:30 pm
Child behavior observations: (check all that apply) ☑ Kept eyes on book ☑ Responded to questions ☑ Made positive comments (ex, "I like that story; read it again; that's funny") ☑ Still interested during second reading ☑ Able to follow instructions (demonstrated gesture; repeated phoneme sound) ☐ Eyes wandered, uninterested look ☐ Didn't respond or response missed the point ☐ Made negative comments ("I'm bored; I don't like this") ☐ Wanted to stop reading through first read-through ☐ Had trouble following instructions (did not try to do gesture or copy phoneme sound)		Child behavior observations: (check all that apply) ☑ Kept eyes on book ☑ Made positive comments ("I like that story; read it again; that's funny") ☑ Able to follow Instructions (demonstrated gesture; repeated phoneme letter sound) ☐ Eyes wandered, uninterested look ☐ Made negative comments ("I'm bored; I don't like this") ☐ Had trouble following instructions (did not try to do gesture or copy phoneme sound)	
Additional Comments:		Additional Comments:	

Figure 4. The data form was used to track fidelity and parent-child interest. Parents were asked to complete the form after reading each study book and each review book. Additionally, a comments section allowed parents to provide feedback of their own. It was often used to explain why boxes were checked, children's comments, or something that excited the parent about children's learning.

Figure 5: Sample Data Form for Control Condition

Code # 115-26

Week # 1	How long did you read? 3:30 AM	Date of Review	How long did you review? 8:00 PM
Day 1 date: 5-12-13	Time: ~20 min	Day 2 Date: 5-13-13	Time: 17 min.

Child behavior observations: (check all that apply)

☑ Kept eyes on book (1st reading)	☑ Eyes wandered, uninterested look (2nd reading)
☑ Responded to questions	☐ Didn't respond or response missed the point
☐ Made positive comments ("I like that story; read it again; that's funny")	☐ Made negative comments ("I'm bored; I don't like this")
☐ Still interested during second reading	☐ Wanted to stop reading through first read-through
☑ Able to follow instructions (points to letter, points to top of page)	☐ Had trouble following instructions (did not point as requested, pointed to wrong things)

Additional Comments:
More interested during first reading.
Enjoyed finding the A's.
Picked up on new vocabulary easily.

Child behavior observations: (check all that apply)

☑ Kept eyes on book	☐ Eyes wandered, uninterested look
☑ Made positive comments ("I like that story; read it again; that's funny")	☐ Made negative comments ("I'm bored; I don't like this")
☑ Able to follow instructions (points to letter, points to top of page)	☐ Had trouble following instructions (did not point as requested, pointed to wrong things)

Additional Comments:
Book: Into the Deep

Week # 1	How long did you read? 18 min.	Date of Review	How long did you review?
Day 3 date: 5-14-13	Time: 8:15 PM	Day 4 Date: 5-15-13	Time:

Child behavior observations: (check all that apply)

☑ Kept eyes on book (1st reading)	☑ Eyes wandered, uninterested look (2nd reading)
☑ Responded to questions	☐ Didn't respond or response missed the point
☑ Made positive comments ("I like that story; read it again; that's funny")	☐ Made negative comments ("I'm bored; I don't like this")
☑ Still interested during second reading	☐ Wanted to stop reading through first read-through
☑ Able to follow instructions (points to letter, points to top of page)	☐ Had trouble following instructions (did not point as requested, pointed to wrong things)

Additional Comments:
Very interactive. He enjoyed answering questions like why the bunny bit the bunny.

Child behavior observations: (check all that apply)

☑ Kept eyes on book	☐ Eyes wandered, uninterested look
☑ Made positive comments ("I like that story; read it again; that's funny")	☐ Made negative comments ("I'm bored; I don't like this")
☑ Able to follow instructions (points to letter, points to top of page)	☐ Had trouble following instructions (did not point as requested, pointed to wrong things)

Additional Comments:
He was happy to show that he retained this weeks learning when prompted

Figure 5. This data form differs slightly from the experimental form in its wording. It refers to print concepts rather than phonemes,

Pretest Assessments

Screening 1: John's Basic Reading Inventory Preprimer Word list

List A-A

1. me
2. get
3. home
4. not
5. he
6. tree
7. girl
8. take
9. book
10. milk
11. dog
12. all
13. apple
14. like
15. go
16. farm
17. went
18. friend
19. about
20. some

Number Correct _____ Total_____

Scoring Guide for Graded Word Lists		
Independent	Instructional	Frustration
20 19	18 17 16 15 14	13 or less

Screening 2: Pseudoword Reading. Children who read one pseudoword correctly were considered full alphabetic (Ehri, 1992, 1995, 1999).

Code#_____

Pseudoword Reading Test: Pretest Version

Directions: I'm going to show you some made-up words. They aren't real words, but some people can read them anyway. I want you to try to read them.

fim _____

sep _____

lat _____

dob _____

huzz _____

Partial: Score 1 point for each recorded phoneme in correct position.
Full: Score 4 points for one pseudoword read correctly.

Score	Interpretation	
17-20	Uses the alphabet to identify words	_____
14-16	growing in awareness of alphabetic principle	_____
0-13	prealphabetic	_____

Letter Recognition. Children were asked to name letters in each row. If the child named fewer than four letters, he or she was excluded from the study. If the child started out by saying letter sounds, further instruction was given: "Just say the letter name, not the letter sound; like the first letter in my name is *M*.

B H R Z T P D

G A J V C I N

M Y F Q K S E

W U X L O m g

k s i r a f b

z h o d t l j

p g e w d u a

y b c x q v n

Letter Recognition Pretest

Test of Phoneme Identities. This was a listening activity.

Code # _____

Preschool Version - Test of Phoneme Identities Pretest
(Adapted from *The Test of Phoneme Identities*, Murray, 2000)

The test is administered conversationally. Read with expression. Do not emphasize phonemes (letter sounds). Accept any repetition of the sentence that includes the target words, but repeat the sentence if either is incorrect. Require a correct approximation of the isolated phoneme. Repeat the question if the student's response is unclear. Circle the response.

Directions: We're going to play a repeating game. First, I'll say a sentence, then you say it back. Then I'll say a sound, and you say it back. Then I want you to listen for the sound in a word. Let's begin.

1. Say: We'll see the moon soon. [Wait.] Now say /s/. Do you hear /s/ in *moon* or *soon*?
2. Say: We hid from him. [Wait.] Now say /m/. Do you hear /m/ in *hid* or *him*?
3. Say: I race to wash my face. [Wait.] Now say /f/. Do you hear /f/ in *race* or *face*?
4. Say: Can you move a moose? [Wait.] Now say /v/. Do you hear /v/ in *move* or *moose*?
5. Say: This card game is hard. [Wait.] Now say /h/. Do you hear /h/ in *card* or *hard*?
6. Say: We found him in the gym. [Wait.] Now say /j/. Do you hear /j/ in *him* or *gym*?
7. Say: We have tar on our car. [Wait.] Now say /k/. Do you hear /k/ in *tar* or *car*?
8. Say: Would you share a pear? [Wait.] Now say /p/. Do you hear /p/ in *share* or *pear*?
9. Say: The pool is part of the park. [Wait.] Now say /t/. Do you hear /t/ in *part* or *park*?
10. Say: The cub will come when you call. [Wait.] Now say /b/. Do you hear /b/ in *cub* or *come*?
11. Say: She likes to leap into deep water. [Wait.] Now say /d/. Do you hear /d/ in *leap* or *deep*?
12. Say: In this game, say your name. [Wait.] Now say /g/. Do you hear /g/ in *game* or *name*?
13. Say: We hate to wait for lunch. [Wait.] Now say /w/. Do you hear /w/ in *hate* or *wait*?
14. Say: Find a space by the spice. [Wait.] Now say /A/. Do you hear /A/ in space or *spice*?
15. Say: This street is straight. [Wait.] Now say /E/. Do you hear /E/ in *street* or *straight*?
16. Say: We go from nine till noon. [Wait.] Now say /I/. Do you hear /I/ in *nine* or *noon*?
17. Say: I have a nose for news. [Wait.] Now say /O/. Do you hear /O/ in *news* or *nose*?
18. Say: He's the last on the list. [Wait.] Now say /a/. Do you hear /a/ in *last* or *list*?
19. Say: On Halloween bring a big bag. Now say /i/. Do you hear /i/ in *big* or *bag*?
20. Say: Move the rock with the rake. [Wait.] Now say /o/. Do you hear /o/ in *rock* or *rake*?

Score	Interpretation	
17-20	well developed phoneme awareness	_____
14-16	growing phoneme awareness	_____
0-13	little phoneme awareness	_____

Phonetic Cue Reading. Children looked at words written on notecards and selected one of the choices as their answer.

Code#_____

Test of Phonetic Cue Reading

Materials: You will need to make individual cards with the words in the "card" column printed in capital letters.

Instructions: I'm going to show you a word, and I'll tell you two words it might be. See if you can use the beginning letter to figure out which word it is.

Pretest version

Card	Question	Card	Question
1. MAD	Is this sad or mad?	7. MICE	Is this mice or nice?
2. FAN	Is this man or fan?	8. LIGHT	Is this light or fight?
3. SAT	Is this sat or fat?	9. LOCK	Is this sock or lock?
4. TEAR	Is this tear [TEER] or near?	10. FOG	Is this log or fog?
5. SELL	Is this sell or tell?	11. TOP	Is this mop or top?
6. NEST	Is this test or nest?	12. NOT	Is this lot or not?

Score	Interpretation	
9-12	partial alphabetic	_____
0-8	chance event	_____

Concepts About Print. This test was used for posttest 1 as well as the pretest. Children were asked the same questions but with different picture books for the posttest.

Code # _____

An Informal Test of Concepts About Print (Pretest-Posttest)
Adapted from Clay, 1979
Bruce & Geralyn Murray

Materials: Picture storybook with print salient features, index cards. For posttests, two other picture storybooks with print salient features, index cards.
Directions: Give the test informally while discussing the open storybook.
Marking key: √ Understands concept.
0 Does not yet understand concept.

Open to any illustrated page beginning with a complete sentence with text on both pages, and ask student to point to . . .

___ Top of page.
___ Up the page.
___ Left page.
___ First part.
___ Bottom of page.
___ Down the page.
___ Right page.
___ Last part. (book, page, line, word, or letter.)

Check directionality. Ask . . .

Where do I find a message?
Where do I start reading?
Which way do I go?
Then where?
Where do I finish a sentence?
Where does the message end?

___ Indicates print, not picture.
___ Indicates top left.
___ Indicates left to right direction.
___ Indicates return sweep to left of next line.
___ Indicates period or question mark
___ Indicates last word on page or last page of book

Take two index cards. Show how they slide, and ask student to slide them to show you . . .

___ One word.
___ One letter.
___ A capital letter.
___ A sentence.
___ First letter in a word.
___ First word on the page.
___ Two words.
___ Two letters.
___ Last letter in a word.
___ Last word on the page

Position _____
Direction _____
Vocabulary _____
CAP Score: _____

Score	Interpretation	Concepts About Print
18-24	Well developed print knowledge	_____
16-17	Growing print knowledge	_____
0-15	Little print knowledge (chance event)	_____

Vocabulary.

Vocabulary Pretest

Directions: First I am going to ask you some questions and the answer will be either yes or no. When we finish those questions, I will ask you to point to a picture to show me the answer.

1. When rain appears on the window does the window look wet?
2. If you have a dentist appointment today will you go to the dentist's office?
3. If you have chosen to sit down, are you standing up?
4. If you know a clever dog can he learn tricks?
5. When you holler, do you talk softly?
6. If you stand in line for a moment does it take a long time?
7. If you had odd socks on, would that mean they look like two different socks?
8. Which one is reading with a buddy?
9. Where do you see clippers?
10. Which line is not curvy?
11. Where do you see different kinds of footprints?
12. Which one looks fresh?
13. Which is medicine?
14. Which one is writing a message?
15. Which tree shows a nest?
16. Point to the orchard.
17. Where do you see a sail?
18. Which one is a signal?
19. Point to the stage.
20. Which one shows a swarm?
21. Which baby has a swollen lip?

Page 2 Vocabulary Test.

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Page 3 Vocabulary Test.

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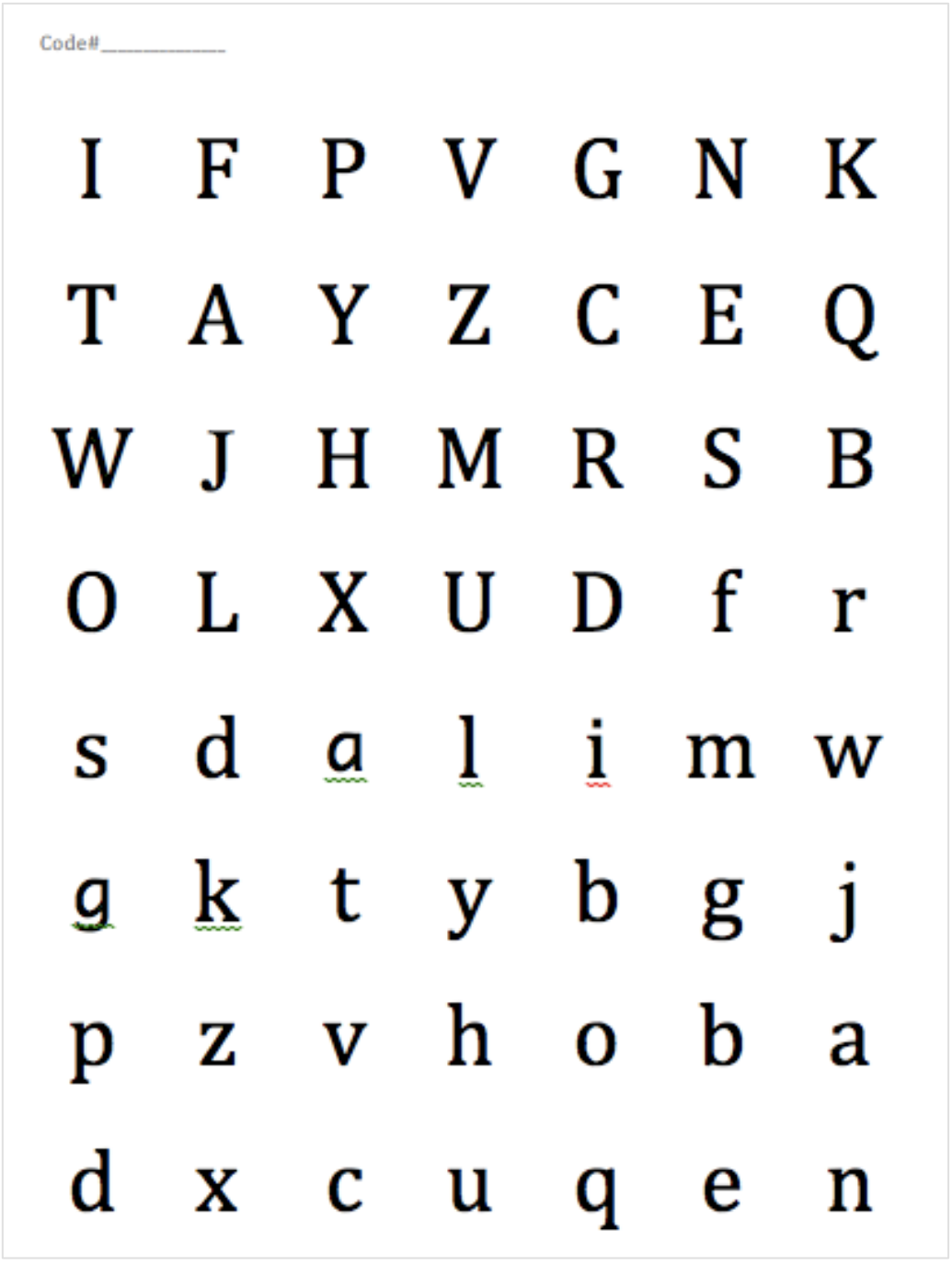
Posttest Assessments

Letter Recognition Post1



Test of Phoneme Identities Post 1

Code # _____

Preschool Version - Test of Phoneme Identities Posttest 1
(Adapted from *The Test of Phoneme Identities*, Murray, 2000)

Materials: None. The test is administered conversationally. Read with expression. Do not emphasize phonemes. Accept any repetition of the sentence that includes the target words, but repeat the sentence if either is incorrect. Require a correct approximation of the isolated phoneme. Repeat the question if the student's response is unclear. Circle the response.

Directions: We're going to play a repeating game. First, I'll say a sentence, then you say it back. Then I'll say a sound, and you say it back. Then I want you to listen for the sound in a word. Let's begin.

1. Say: This is a nice night. [Wait.] Now say /s/. Do you hear /s/ in *nice* or *night*?
2. Say: The chief had paint on his cheek. [Wait.] Now say /f/. Do you hear /f/ in *chief* or *cheek*?
3. Say: The tree made shade. [Wait.] Now say /m/. Do you hear /m/ in *made* or *shade*?
4. Say: The man was driving a van. [Wait.] Now say /v/. Do you hear /v/ in *man* or *van*?
5. Say: Jack and Jill went up the hill. [Wait.] Now say /h/. Do you hear /h/ in *Jill* or *hill*?
6. Say: The bridge is made of brick. [Wait.] Now say /j/. Do you hear /j/ in *bridge* or *brick*?
7. Say: I like your new light. [Wait.] Now say /k/. Do you hear /k/ in *like* or *light*?
8. Say: Don't step on the stem. [Wait.] Now say /p/. Do you hear /p/ in *step* or *stem*?
9. Say: Who took my book? [Wait.] Now say /t/. Do you hear /t/ in *took* or *book*?
10. Say: That toy belongs to the new boy. [Wait.] Now say /b/. Do you hear /b/ in *toy* or *boy*?
11. Say: I had to have some food. [Wait.] Now say /d/. Do you hear /d/ in *had* or *have*?
12. Say: The cookies are in the back of the bag. [Wait.] Now say /g/. Do you hear /g/ in *back* or *bag*?
13. Say: I know the way to Green Bay. [Wait.] Now say /w/. Do you hear /w/ in *way* or *bay*?
14. Say: They like to run in the rain. [Wait.] Now say /A/. Do you hear /A/ in *run* or *rain*?
15. Say: Read the story about the ride. [Wait.] Now say /E/. Do you hear /E/ in *read* or *ride*?
16. Say: We rode a mule for a mile. [Wait.] Now say /I/. Do you hear /I/ in *mule* or *mile*?
17. Say: I took the ham home. [Wait.] Now say /O/. Do you hear /O/ in *ham* or *home*?
18. Say: You have to be fast to be first. [Wait.] Now say /a/. Do you hear /a/ in *fast* or *first*?
19. Say: Look on the table or in the drawer. [Wait.] Now say /i/. Do you hear /i/ in *on* or *in*?
20. Say: Tap the top of the drum. [Wait.] Now say /o/. Do you hear /o/ in *tap* or *top*?

Score	Interpretation	
17-20	Well developed phoneme awareness	_____
14-16	Growing phoneme awareness	_____
0-13	Little phoneme awareness	_____

Pseudoword Reading and Phonetic Cue Reading Post 1

Code#_____

Pseudoword Reading Test [POSTTEST]

Materials: Print the pseudowords below on plain cards or on a sheet of paper. Write the response on the line; you may have to invent a spelling.
Directions: I'm going to show you some made-up words. They aren't really words, but some people can read them anyway. Can you?

pid _____

lem _____

san _____

vot _____

mub _____

Test of Phonetic Cue Reading [POSTTEST]

Materials: Make individual cards with the words in the "card" column printed in capital letters.
Instructions: I'm going to show you some words, and I'm going to tell you two words it might be. See if you can use the beginning letter to figure out which word it is.

Card	Question	Circle response	
1. AND	Is this *sand* or *and*?	sand	and
2. TOP	Is this *top* or *tap*?	top	tap
3. IF	Is this *it* or *if*?	it	if
4. BEAM	Is this *beam* or *beat*?	beam	beat
5. OX	Is this *ox* or *fox*?	ox	fox
6. WELT	Is this *melt* or *welt*?	melt	welt
7. SAT	Is this *sat* or *sit*?	sat	sit
8. HUB	Is this *hut* or *hub*?	hut	hub
9. SOUTH	Is this *mouth* or *south*?	mouth	south
10. HARM	Is this *harm* or *arm*?	harm	arm
11. COOL	Is this *cool* or *fool*?	cool	fool
12. FUSS	Is this *fun* or *fuss*?	fun	fuss

Scoring Form Posttest 1 Assessment

Vocabulary Posttest.

Page 1.

Vocabulary Posttest

1. *Appear* – When rain appears on the window does the window look dry?
2. *Appointment* – Do you wait at the doctor's office when you have an appointment with your doctor?
3. *Chosen* – If you have chosen a red piece of candy to eat, is the candy green?
4. *Clever* – If your friend is clever can she learn new things?
5. *Holler* – When you go outside and holler, does that mean you shout?
6. *Moment* – If you stand in line for a moment did it take just a little time?
7. *Odd* – If I have odd socks on, does that mean they look the same as everyone else's socks?
8. Buddy - Which one is reading without a buddy?
9. Clippers – Which picture does not show clippers?
10. Curvy – Which line is curvy?
11. Footprints – Which one does not show a footprint?
12. Fresh – Which one does not look fresh?
13. Medicine - Which is a spoon of medicine?
14. Message – Which one shows a message?
15. Which is not a bird nest?
16. Nest– Orchard – Which is the orchard?
17. Sail – which boat is missing a sail?
18. Signal – Which one is not a traffic signal?
19. Stage – Which does not show a stage?
20. Swarm – Which one shows a swarm?
21. Swollen – Which one shows a swollen foot?

Vocabulary Page 2. For the posttest, test items were shown on an i-pad rather than a printed copy.

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Vocabulary Page 3.

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Delayed Posttests

Letter Recognition 3.

Code#_____

H R J W M S B

Y C A T Z E Q

P G F I V N K

X D L O U f r

v o z p h b w

a i d s l e m

c q x a u d n

t b k *g* y g j

Test of Phoneme Identities 3.

Code #_____

Preschool Version - Test of Phoneme Identities (Delayed-Posttest)
(Adapted from *The Test of Phoneme Identities*, Murray, 2000)

Materials: None. The test is administered conversationally. Read with expression. Do not emphasize phonemes. Accept any repetition of the sentence that includes the target words, but repeat the sentence if either is incorrect. Require a correct approximation of the isolated phoneme. Repeat the question if the student's response is unclear. Circle the response.

Directions: We're going to play a repeating game. First, I'll say a sentence, then you say it back. Then I'll say a sound, and you say it back. Then I want you to listen for the sound in a word. Let's begin.

1. Say: I'll sail by the whale. [Wait.] Now say /s/. Do you hear /s/ in *sail* or *whale*?
2. Say: The chief had a red cheek. [Wait.] Now say /f/. Do you hear /f/ in *chief* or *cheek*?
3. Say: I saw a very tan man. [Wait.] Now say /m/. Do you hear /m/ in *tan* or *man*?
4. Say: I tried to save the sail. [Wait.] Now say /v/. Do you hear /v/ in *save* or *sail*?
5. Say: He'll bike before the hike. [Wait.] Now say /h/. Do you hear /h/ in *bike* or *hike*?
6. Say: He told a joke about smoke. [Wait.] Now say /j/. Do you hear /j/ in *joke* or *smoke*?
7. Say: The track has a trap. [Wait.] Now say /k/. Do you hear /k/ in *track* or *trap*?
8. Say: Don't trip on the trim. [Wait.] Now say /p/. Do you hear /p/ in *trip* or *trim*?
9. Say: Where is the pool tool? [Wait.] Now say /t/. Do you hear /t/ in *pool* or *tool*?
10. Say: My cook wrote the book. [Wait.] Now say /b/. Do you hear /b/ in *cook* or *book*?
11. Say: The lid will catch the lint. [Wait.] Now say /d/. Do you hear /d/ in *lid* or *lint*?
12. Say: They only pick the best pig. [Wait.] Now say /g/. Do you hear /g/ in *pick* or *pig*?
13. Say: You will win when you grin. [Wait.] Now say /w/. Do you hear /w/ in *win* or *grin*?
14. Say: The rain won't ruin the fun. [Wait.] Now say /A/. Do you hear /A/ in *rain* or *ruin*?
15. Say: Have you seen the silly sign? [Wait.] Now say /E/. Do you hear /E/ in *seen* or *sign*?
16. Say: We like to sit by the lake. [Wait.] Now say /I/. Do you hear /I/ in *like* or *lake*?
17. Say: We took bait in the boat. [Wait.] Now say /O/. Do you hear /O/ in *bait* or *boat*?
18. Say: Does your new hat hurt? [Wait.] Now say /a/. Do you hear /a/ in *hat* or *hurt*?
19. Say: See if the light is turned off. [Wait.] Now say /i/. Do you hear /i/ in *if* or *off*?
20. Say: Please stop by the step. [Wait.] Now say /o/. Do you hear /o/ in *stop* or *step*?

Score	Interpretation	
17-20	Well developed phoneme awareness	_____
14-17	Growing phoneme awareness	_____
0-13	Little phoneme awareness	_____

Pseudoword Reading and Phonetic Cue Reading 3.

Code # _____

Pseudoword Reading Test [Delayed-Posttest]

Materials: Print the pseudowords below on plain cards or on a sheet of paper. Write the response on the line; you may have to invent a spelling.
Directions: I'm going to show you some made-up words. They aren't really words, but some people can read them anyway. Can you?

bis _____

weff _____

tob _____

hus _____

fam _____

Test of Phonetic Cue Reading [Delayed-Posttest]

Materials: Make individual cards with the words in the "card" column printed in capital letters.
Instructions: I'm going to show you some words, and I'm going to tell you two words it might be. See if you can use the letters to figure out which word it is.

Card	Question	Circle response	
1. AXE	Is this *axe* or *ox*?	axe	ox
2. CAR	Is this *car* or *calf*?	car	calf
3. SLIP	Is this *slim* or *slip*?	slim	slip
4. TAB	Is this *tab* or *tam*?	tab	tam
5. LIST	Is this *lift* or *list*?	lift	list
6. OWE	Is this *owe* or *oat*?	owe	oat
7. POT	Is this *pat* or *pot*?	pat	pot
8. ROAM	Is this *roam* or *home*?	roam	home
9. HOOF	Is this *hoof* or *hood*?	hoof	hood
10. RUG	Is this *rag* or *rug*?	rag	rug
11. TOOL	Is this *wool* or *tool*?	wool	tool
12. HUNCH	Is this *bunch* or *hunch*?	bunch	hunch

Concepts About Print 3.

Code # _____ Delayed Posttest

An Informal Test of Concepts About Print (Pretest-Posttest)
Adapted from Clay, 1979
Bruce & Geralyn Murray

Materials: Picture storybook with print salient features, index cards. For posttests, two other picture storybooks with print salient features, index cards.
Directions: Give the test informally while discussing the open storybook.
Marking key: √ Understands concept. 0 Does not yet understand concept.

Open to any illustrated page beginning with a complete sentence with text on both pages, and ask student to point to . . .

___ Top of page. ___ Bottom of page.
___ Up the page. ___ Down the page.
___ Left page. ___ Right page.
___ First part. ___ Last part. (book, page, line, word, or letter.)

Check directionality. Ask . . .

Where do I find a message? ___ Indicates print, not picture.
Where do I start reading? ___ Indicates top left.
Which way do I go? ___ Indicates left to right direction.
Then where? ___ Indicates return sweep to left of next line.
Where do I finish a sentence? ___ Indicates period or question mark
Where does the message end? ___ Indicates last word on page or last page of book

Take two index cards. Show how they slide, and ask student to slide them to show you . . .

___ One word. ___ Two words.
___ Big word > 3. ___ Little word ≤. 3
___ A capital letter.
___ A sentence (sweeps from 1st cap to period.)
___ First letter in a word. ___ Last letter in a word.
___ First word on the page. ___ Last word on the page

Position _____ Vocabulary _____
Direction _____ **CAP Score:** _____

Additional CAP Delayed Posttest Items:

How can you tell if someone is talking on this page? ___ Points to quotation marks.
How can you tell if you should read with excitement? ___ Points to exclamation mark.
Where do you see a question? ___ Points to question mark.
Do you see a period on the page? ___ Points to period.
Do you know what this is called? (point to question mark) ___ Question mark.
Do you know what this is called? (point to quotes) ___ Quotation mark.
Do you know what this is called? (point to exclamation) ___ Exclamation mark.

CAP-Punctuation Score _____

APPENDIX D

Phoneme Awareness Training Sample Materials

Figure 6: Phoneme Analogy Cards

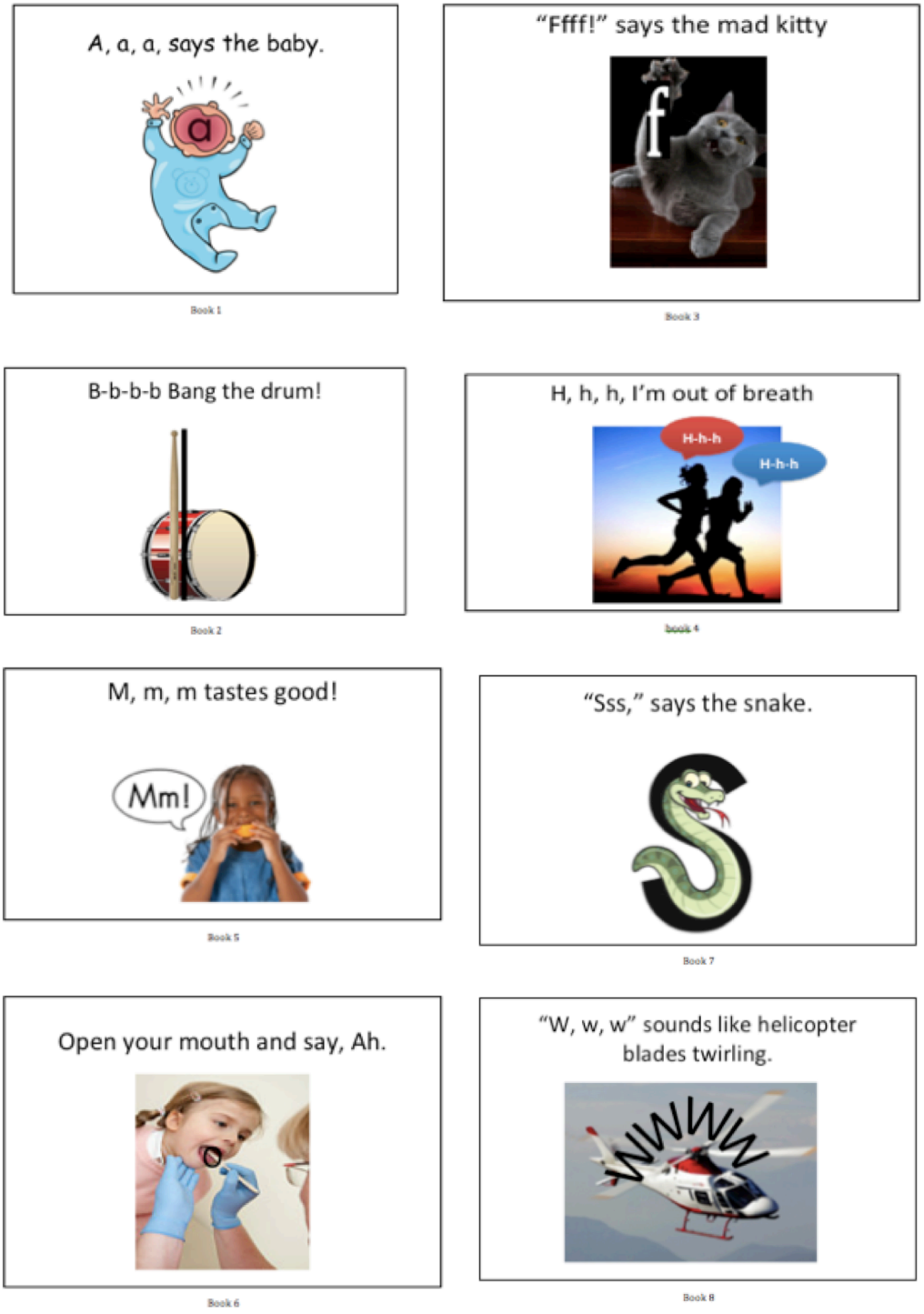
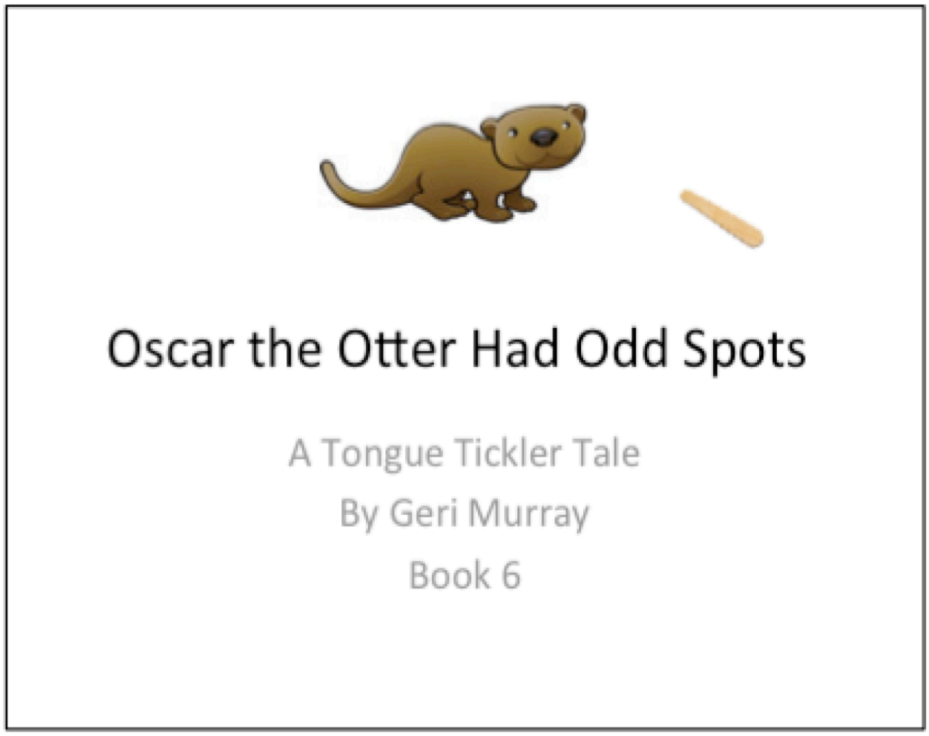


Figure 6. Analogy cards were used to provide a memorable link to the target phoneme within each book.

Photo credits: Murray, B. *The Reading Genie:* *www.auburn.edu/rdggenie/*; *http://www.stockfreeimages.com*;
Karen Harrison: *Fully Feline:* *http://fullyfeline.com/2012/08/cat-psychology-stellas-story/*;
Rolera LLC: www.Clker.com

Phoneme Awareness Parent Script

Phoneme Awareness Instructional Script. The cover page of the children's book is embedded in the script for quick reference. The parent is directed to give a *booktalk* prior to reading to arouse interest and activate background knowledge. Before the second reading the parent provides the child with a rationale for learning a new phoneme, which is /o/ for reading two.



Before First Reading
Say: This is a story of a little otter named Oscar. One day when Oscar woke up, he didn't feel very well. Mama said they would have to see the Doctor. Now Oscar was worried, too. Let's see what happens when Oscar visits the Doctor.

Before Second Reading
Say: This time when I read the story, we're going to look for O. O looks like a circle and it makes the sound that you say when the doctor wants to see your throat: /o/ (ah).
While I'm reading we can play a game. When you hear /o/ you can pretend to shine your flashlight like a doctor [demonstrate].

Page 2 of script with text of book.

"Ah, Ah, Ah choo!" said Oscar. Oscar didn't feel well at all. On top of that, he had odd spots in his throat.

"I will see if Dr. Oz the otter doctor can see you today," said Mother Otter.

After First Reading

Say: Have you heard of the word odd? Here odd means different from what you usually see. If you see the same thing all the time, it isn't odd. It is the usual way. Spots in the throat are odd because we don't usually have them. Which is odd, clear water coming from the sink or orange water from the sink? People with three hands or two hands?
What do you think might be wrong with Oscar?

Before Second Reading

Say: Do you see *o*'s on this page? Find a capital *o*. Now a lowercase *o*.
When you hear me read a word with *o*, open your mouth wide and say /o/.

Page 3 of script with text of book.

Oscar was worried about visiting Doctor Oz. He had never seen him before. He didn't know what would happen.

After First Reading
Say: Sometimes we worry a little when we go to a new place because we don't know what will happen, just like Oscar.
Could it also be exciting? Like going to see a movie or going to the Zoo?
Why do you think Oscar is worried instead of excited?

Before Second Reading
Say: I am going to read this page and listen for /o/ as I read. I can hear it in Oscar.
What can you hear it in?

[**After reading**] **Say**: Did you hear it in doctor? How about in happen? No, I didn't hear it either in happen. That sounds like crybaby *a* in h –a-a-appen.

Page 4 of script with text of book.

Mother called Dr. Oz and he told her to bring Oscar by his office. After a long wait, Dr. Oz appeared. He told Oscar to open his mouth wide and say, "Ahh." Then he shined a little flashlight down his throat.

After First reading

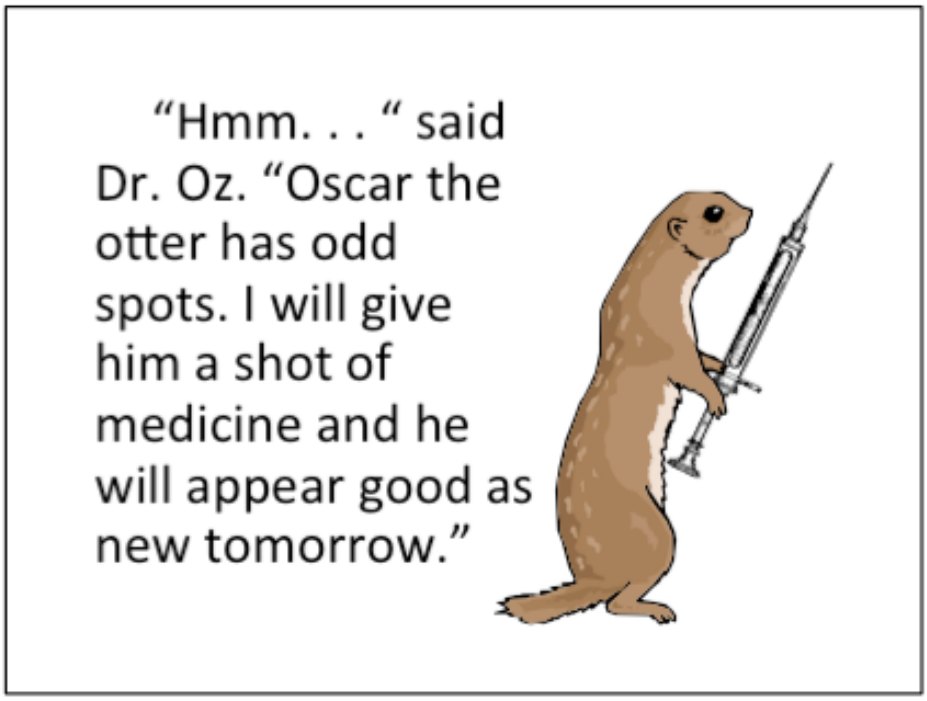
Say: It says Dr. Oz appeared. What do you think that means? When something *appears*, you didn't see it before, but now you see it. Do our ears appear? No, we can see them in the mirror. They don't go away but sometimes they hide under a hat. If we go to visit our grandparents and knock on the door, our grandma will appear when the door opens. Which one might appear at the front door? A friend or a lion? [Respond to child's remarks.]

Say: Back to our story: Why do you think the doctor used a flashlight to look at Oscar's throat?

Before Second reading

Say: The doctor is looking at Oscar's throat on this page. Do you know what Oscar has to say so the doctor can see his throat? Whenever you hear /o/ in a word, open your mouth wide for the doctor.

Page 5 of script with text of book.



After First reading: What do you think the shot will do? It will put the medicine right where he needs it, to fight germs. Do you know what medicine is? Medicine is a germ fighter. It's not something that makes germs grow. It makes germs die. Is dirt medicine? No germs like dirt. Can you take medicine with a spoon instead of a needle? Yes. You can just swallow some kinds of medicine.

Before Second reading, Say: Pretend to shine a flashlight down your throat when you hear /o/ as I read this.

[**after reading**] **Say**: Did you see the letter O on this page? Are there any words with more than one *o?* How about the last word at the bottom of the page? Let's count the o's.

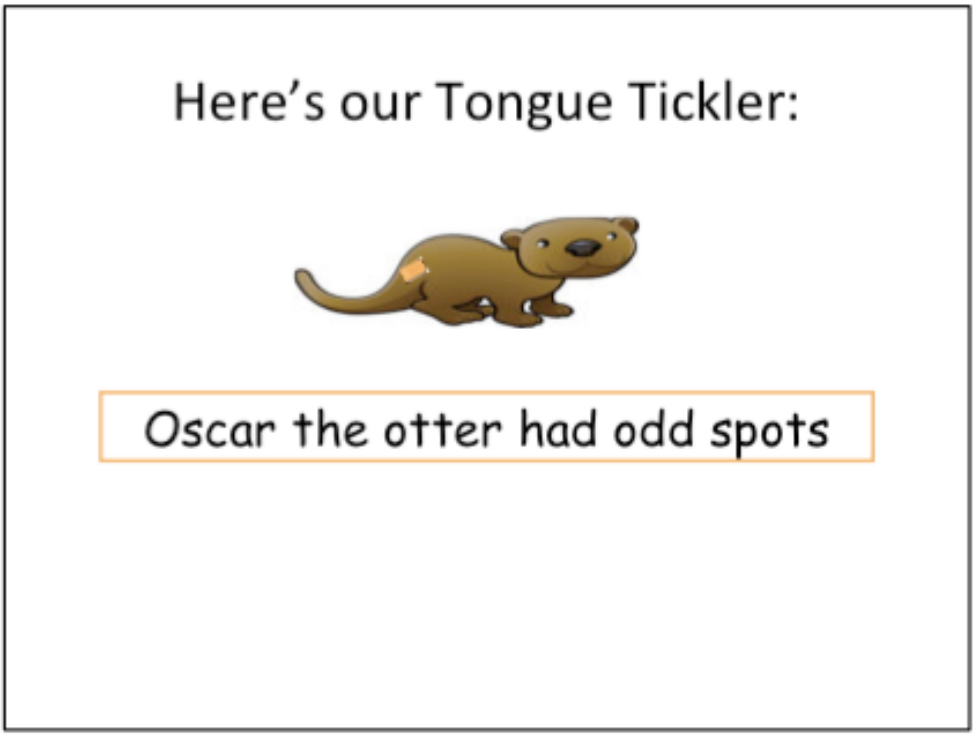
Page 6 of script with text of book.

Oscar closed his eyes and guess what happened? Just a little stingy feeling. He went home, fell right to sleep, and he felt much better the next day. No more odd spots appeared; the medicine worked.

After First Reading:
Say: Do you think Oscar was brave to take the shot? Why do you think Oscar felt better the next day?

Before Second Reading:
Say: Do you think we'll hear some /o/ sounds in words on this page? Yes, there's Oscar. Shine your flashlight down your throat when you hear /o/ as I read.

Page 7 of script with text of book.

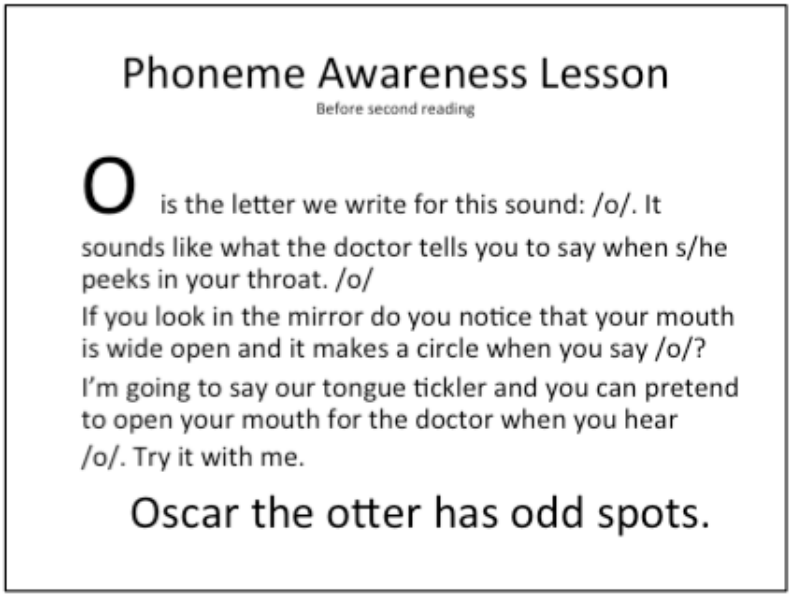


After First reading: Let's say our tongue tickler together.

After Second reading
Say: Let's say our tongue tickler again and stretch out the /o/ O-o-oscar the o-o-otter has o-o-odd sp-o-o-ots

Pages 8 and 9 of script with phoneme analogy card and directions for PA lesson.

After completing the first read through, introduce the phoneme with the graphic image.



Introduce child to the letter, the letter "sound," the way it looks when you say it, directing child to look in a mirror. Also associate the image with the sound (beating a drum) and a gesture to signal that the child hears the sound. (pretend to beat on the drum)

Page 10 of script: Practice oral phoneme detection.

Model and Practice Finding /o/ in words.

When I say *otter*, I feel my mouth open and it makes a circle. O-tter (exaggerate open mouth). Now I'm going to try another word: seal. No /o/. I didn't feel my mouth open in a circle or hear the sound I make for the doctor.

You try saying otter and look at your mouth in the mirror to see if it's open in a circle and you hear the doctor sound.

Let's try our tongue tickler again and you open your mouth whenever you hear /o/. Oscar the otter has odd spots. Let's try it again and break off the /o/: O-scar the o-tter has o-dd sp-o-ts.

If you hear /o/ in the words I say, open your mouth for the doctor: odd, even, on, under, spot.

Figure 7. Specialized Writing Paper.

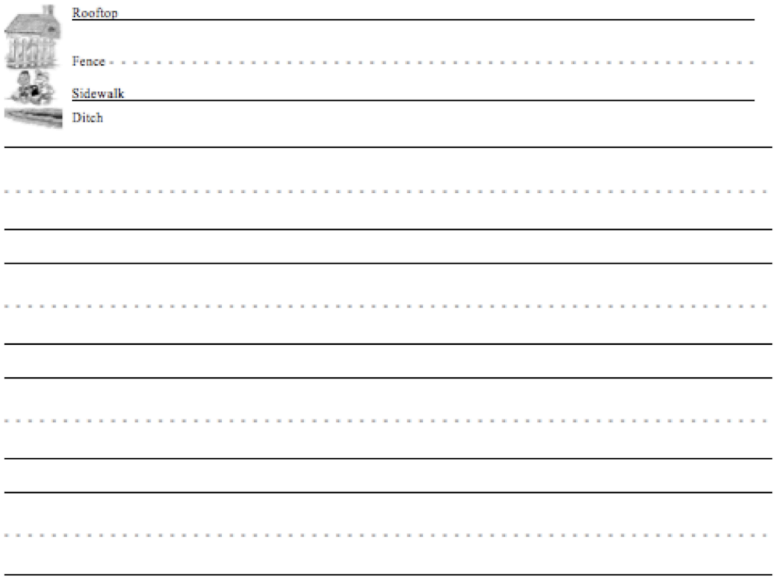
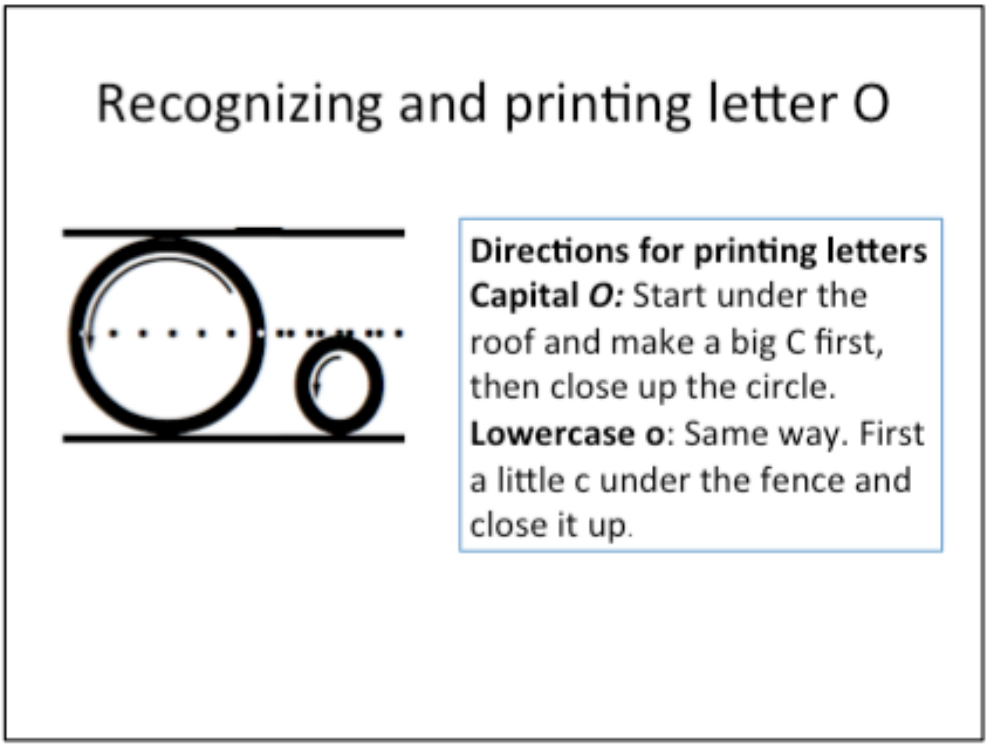


Figure 7. This paper was designed to help children be aware of position, placement, and direction in which letters are properly formed. Example of explicit directions for writing a letter found on p.137, from: *The Reading Genie*.

Page 11 of script: Writing Practice and applying PA to word reading.



Say: When I read, I look at the letters to see what I need to say. They tell me to make their sounds. This is what O looks like. It tells me to open my mouth and say /o/. I'm going to write a Capital O and a small o while you watch, then I'll tell you how to do it on the special paper.
[Use directions to describe placement and direction for forming *O, o.*]

Say: Now I'm going to show you a word, and you tell me which word it is. Listen for the /o/ word and remember that the letter *O* tells us to say /o/.
Say: [Show card TOP] Is this top or tap? [Show card HAT] Is this hat or hot? [Show card MOP] Is this mop or map?

Say: Now we are going to read our story again, but this time, we'll look for *O* on the page and you can shine the flashlight when you hear me say *O* words. My lips will look like fish lips and I'll make the doctor sound, /o/.

Word Cards: Used to Apply Letter-Sound Knowledge after PA Lesson.

CAT	BOOK
BIG	BIKE
LAP	LATE
FAN	HOME
PACE	LIKE
BUFF	HARD
MAN	TOP
SILK	HAT
TRIM	MOP
SAD	WIG
BIT	STOW
SAND	STORE

APPENDIX E

Print Concepts Training Materials

Print Concept Book Contents

Concept of message: The print, not the picture, carries the message.
Book Title: *Queen Abby's Message*
Focus Letter *A*
Print Vocabulary: message, print, picture, title

Directionality I: Where to begin reading, where to end.
Book Title: *Bunnies Are Not Lunch!*
Letter *B*
Print Vocabulary: First, next, last top, and bottom

Directionality II Start on the left and go to the right.
Book Title: *How Fred Hurt His Foot*
Letter *F*
Print Vocabulary: Left, right

Concept of sentence: How to find a sentence.
Book Title *Hannah's Bad Hair Day*
Letter *H*
Print Vocabulary: Beginning, ending, period

Special marks: Punctuation tells us to read like we talk.
Book Title: *Who made the Mess?*
Letter *M*
Print Vocabulary: exclamation mark, question mark, quotation mark

Concept of word (Oscar is sick) *O*
Book Title: *Oscar Visits the Doctor*
Letter *O*
Print Vocabulary: Spaces, word, big word, little word

Concept of letter: Letters help us read words.
Book Title: *Sarah's Strange Birds*
Letter *S*
Print Vocabulary: Capital letter, lower case letters

Print Concept Review
Book Title: *Wendy on stage*
Letter *W*
Print Vocabulary: concepts of book, directionality, sentence, word, letter, special marks

Figure 8. Letter cards used to help children search for letters in texts and for print practice.

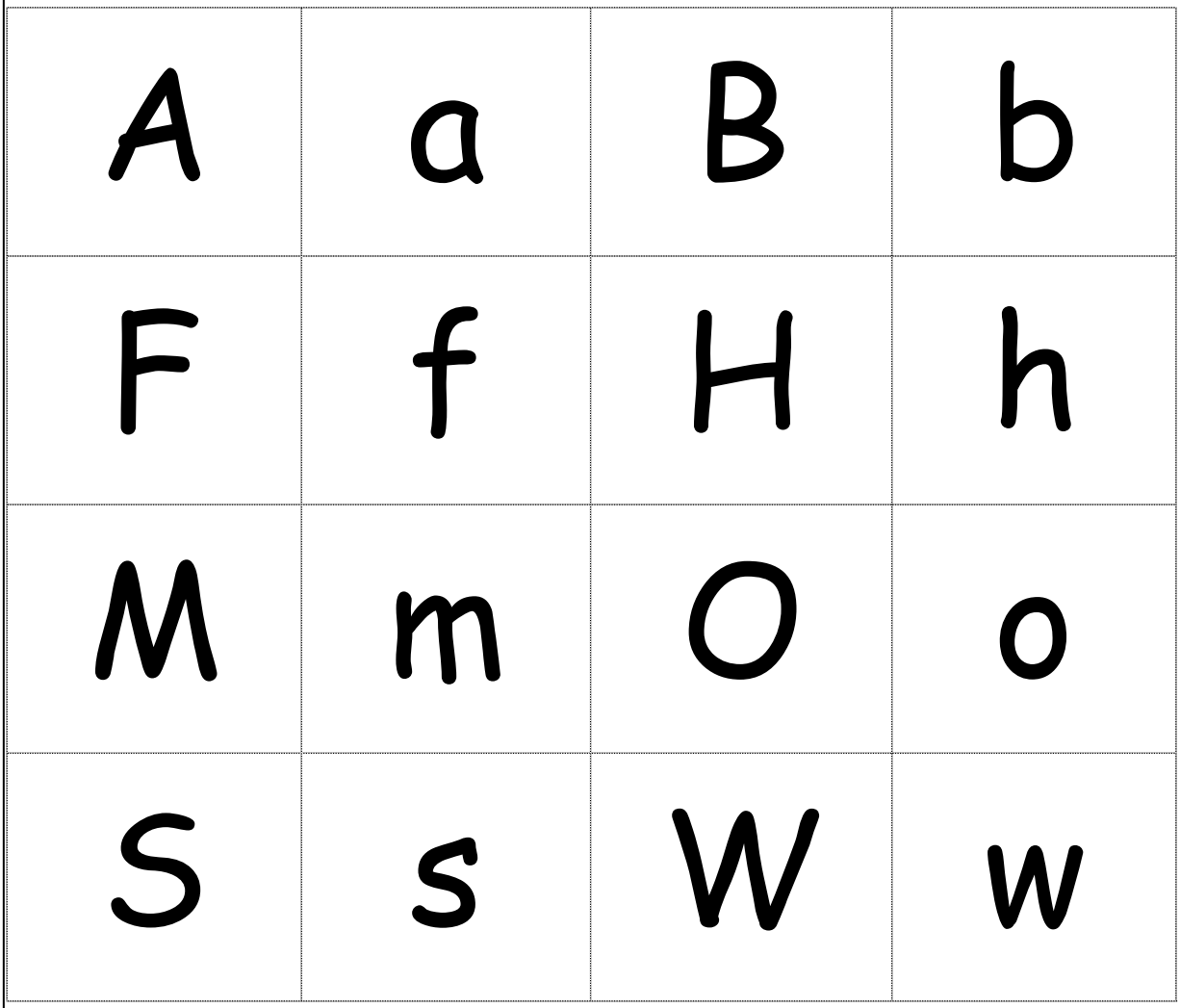
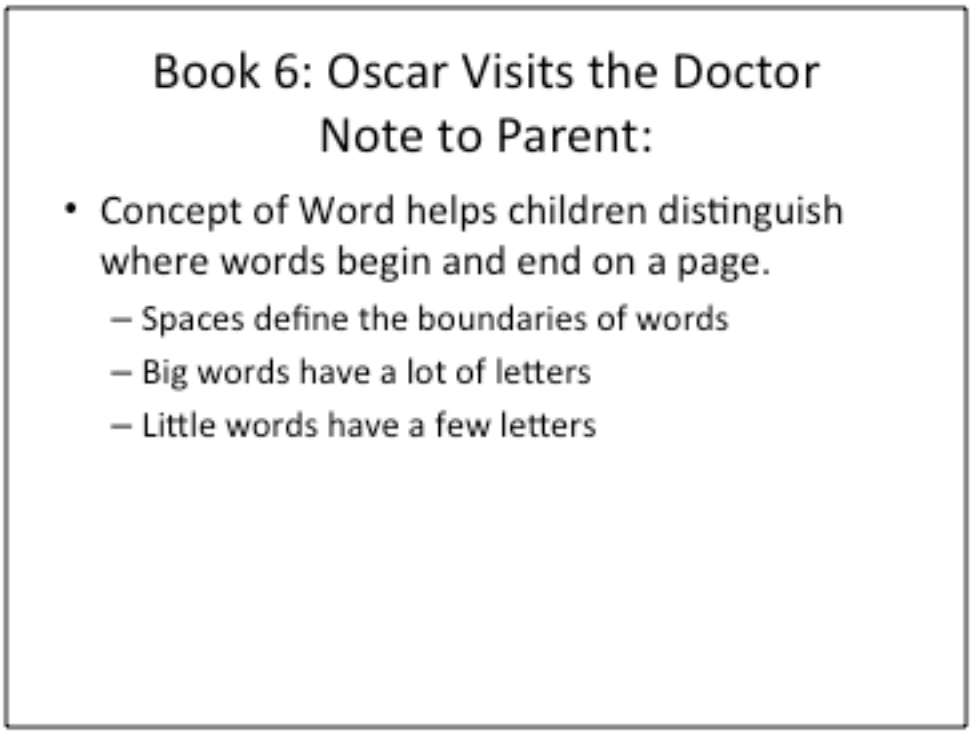


Figure 8. Letter cards were used to help children find letters in the books during the second reading of the text, and to provide an example for print practice using special primary paper and directions provided in the script.

Page 1: CAP training script, explanation of print concept taught in the story.



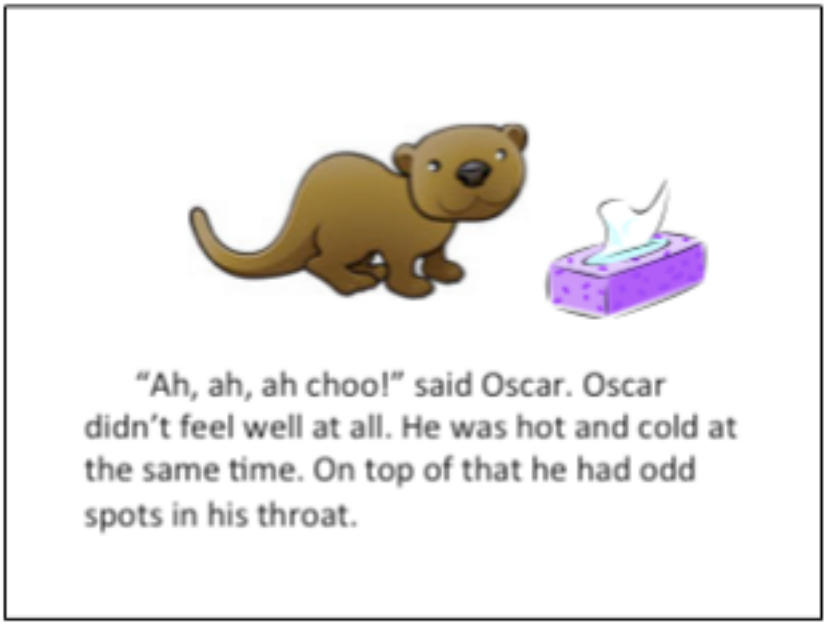
Word boundaries are simple to point out in written texts but not as easy to hear in spoken language. When children become aware of written word boundaries and word spellings, they can recognize words in spoken language.

Page 2: Booktalk and Script for introducing new print concept.

First Reading
Say: This is a story of a little otter named Oscar. One day when Oscar woke up, he didn't feel very well. Mama said they would have to see the Doctor. Now Oscar was worried, too. Let's see what happens when Oscar visits the Doctor.

Second Reading
Say: We've talked so much about reading. Today while we read the story again, we're going to talk about words. A message is made of words. They are what we read when we want to find out what's happening in a book. I'll show you how I know where words start and end.
We'll also look for the letter O. It looks like a circle or an oval. [Show letter card O]

Page 3: First page in the text plus script for teaching new words and new concept during second reading.



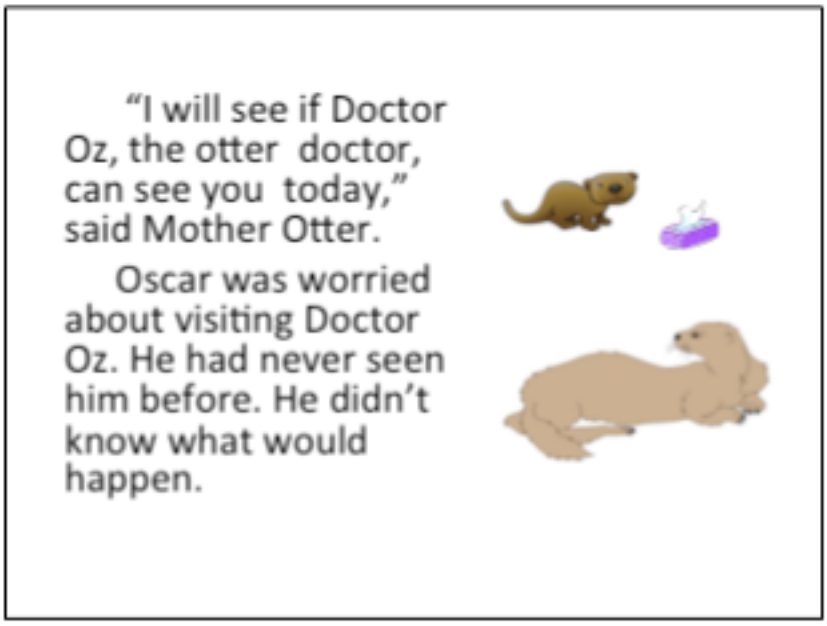
First Reading (After reading the page.)

Say: Have you heard of the word odd? Here odd means different from what you usually see.
- If you see the same thing all the time, it isn't odd. It is the usual way.
- Spots in the throat are odd because we don't usually have them. Which is odd, clear water or pink water? Three hands or two hands?
- What do you think might be wrong with Oscar?

Second Reading (After reading the page.)

Say: When I read words I notice that there are spaces between them. [Point to Ah, ah, ah choo!]
- The word *ah* is little with two letters and then a space. There it is again, the same two letters with the space. Every time I see a little space I know I am done reading a word. "Ah, ah, ah choo" means Oscar is sneezing.
- After the next two words I see a stop and think sign, the period. So I'll think about all the words I read, "Ah, ah, ah, choo!" said Oscar. Look, quotation marks.
- Who said something? It was Oscar making sneezing sounds.
- The exclamation mark tells me it was surprising. Sneezes always surprise us.
- Let's look at the last sentence on the page and count the words. We have to pay attention to the spaces to find the words. [Fingerpoint and count with your child.]

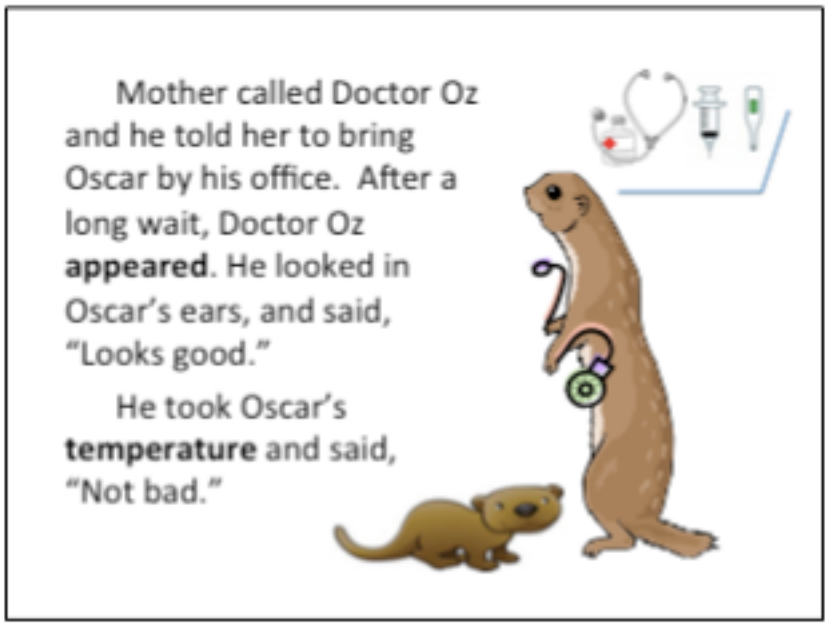
Page 4: Script for 2nd page of story.



First Reading (After reading the page)
Ask: Do we sometimes worry when we go to a new place?
It could be exciting, couldn't it? We don't know what's is there.
Why do you think Oscar is worried instead of excited?

Second Reading (After reading the page)
Say: Sometimes words only have one letter. Do you see this letter *I* right here all by itself? It has a space before it and another space after it so it is just one word: I. It's what you say when you are talking about yourself. I am going to the doctor. I am sick. One word. So there are spaces on both sides of it so we can see that word all by itself. If the *I* is with other letters, it's part of a different word.
- Look here [fourth word] Now we see *I* with another letter right next to it. That word is if. Both of these words are very little words because they just have a few letters. Let's see if we can count all the little words that just have one, two or three letters. [little words = 14]
Do you see any words with a big or little O?

Page 5: script for third page of story.



First Reading: (after reading the page)

Say: It says Dr. Oz *appeared*. What do you think that means?

- Appeared means something can be seen.
- When something appears, you didn't see it before, but now you see it.
- Do our ears appear? No, we can see them in the mirror. They don't go away.
- If we visit our grandparents and knock on the door, grandma will appear when the door opens.
- Which one might appear at our front door? A friend or a monkey? [Respond to child's remarks.]

Say: Back to our story: Why do you think the doctor used a flashlight to look at Oscar's throat? [respond to child's remarks]

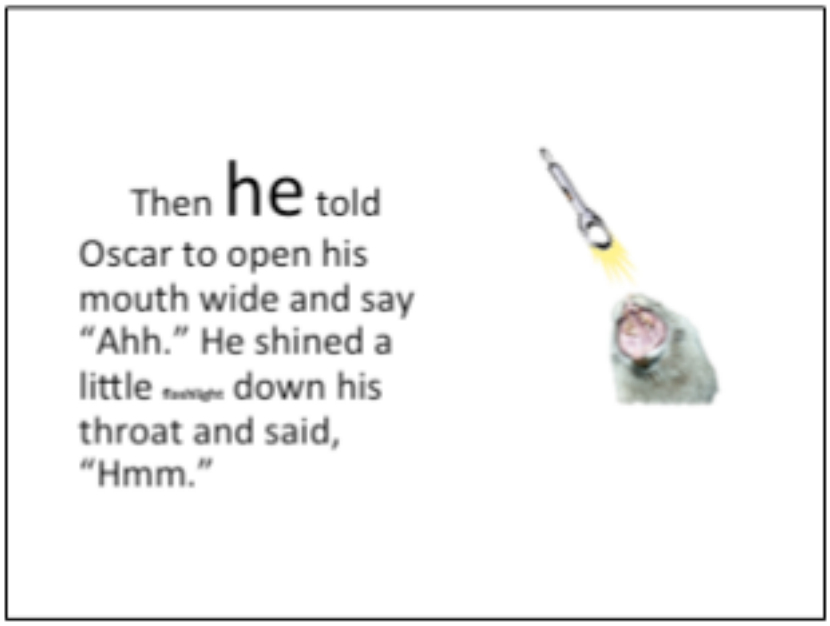
- If Oscar's temperature is not bad, it means he's not too hot. When he is too hot, it means he's very sick. Temperature tells us how hot or how cold something is.

Second Reading: (after reading the page)

Say: Do you see some big words on this page that have a lot of letters and a space before and after them? Big words have a lot of letters. They aren't big like an elephant.

- Here is a big word, *temperature*. It takes longer to say *temperature* than it does to say *hot*. *Hot* is a little word. Do you see another big word on the page? That's the word we talked about the first time we read the story: appeared. That's a big word. Can you show me a little word?

Page 6: Script for 4th page of story.



First Reading:
Say: Why do you think he is shining a flashlight down Oscar's throat? Do you think something appeared in his throat?

Second Reading:

After reading the page, say

- I know there are big and small words on this page. One of the little words has some very big letters. Can you point to it? That word is he.
- The second sentence has a big word, but it is written with very small letters. It is still a big word because it has so many letters. Can you point to it? That word is *flashlight*. It takes more time to say *flashlight* than to say *he*.
- Let's see how many words are in the first sentence. [fingerpoint and count words up to 12.]
- How about the letter O. Are there any on the page?

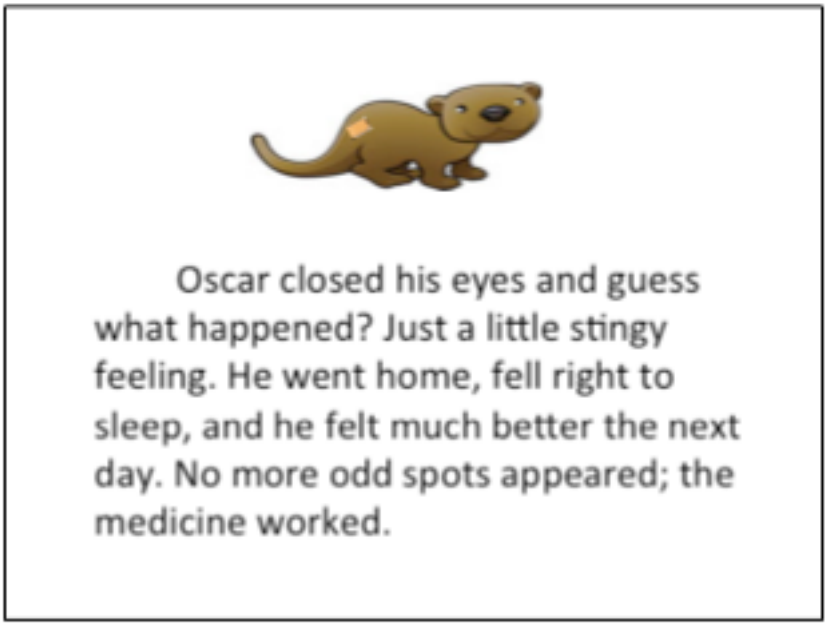
Page 7: Script for 5th page of story.

First reading:
Say: What do you think the shot will do? [wait for response]

- It will put the medicine right where he needs it, to fight germs that make us feel sick. Oscar should feel better tomorrow.
- Do you know what medicine is? Medicine is something that fights germs. It's not something that makes the germs grow. It makes the germs die.
- Is dirt medicine? No germs like dirt.
- Can you take medicine with a spoon instead of a needle? Yes. You can just swallow medicine, but sometimes, only medicine in the needle can help.

Second Reading:
[Read page first then say]: I see some big words on this page. Point to some big words. Let's touch each word on the page and we'll stop when we get to a big one so I can tell you what it says.

Page 8: Script for page 6 in story.



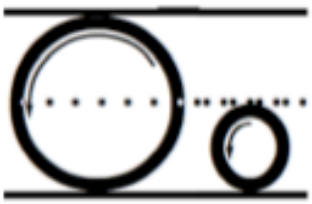
First Reading: (after reading the page)
Say: Do you think Oscar was brave to take the shot? Did it make him feel better? Do you know what made the spots appear? [the germs]

Second Reading: (after reading the page)
Say: Show me one little word on the page.
Show me one big word.
Let's look at the last sentence at the bottom of the page.
How many words are in the sentence?
Touch each word as we count.
Also if you see any O's, let me know.

Say: Now that we're done, it's time to practice writing *o* on our special paper. I'll tell you how to make the *o* look just right.

Writing Practice

Recognizing and printing letter O



Directions for printing letters
Capital *O:* Start under the roof and make a big C first, then close up the circle.
Lowercase o: Same way. First a little c under the fence and close it up.

Rooftop

Fence

Sidewalk

Ditch