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Explicit Teacher-Implemented Phoneme Awareness Instruction: Preschool Effects

Heather M. Osterhouse

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EXPLICIT TEACHER-IMPLEMENTED PHONEME AWARENESS
INSTRUCTION: PRESCHOOL EFFECTS

by

Heather M. Osterhouse

A thesis submitted to the Graduate College
in partial fulfillment of the requirements for
the degree of Master of Arts
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EXPLICIT TEACHER-IMPLEMENTED PHONEME AWARENESS INSTRUCTION: PRESCHOOL EFFECTS

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Western Michigan University, 2013

The purpose of the current study was to investigate the impact of explicit, concentrated, teacher-implemented phonological awareness instruction for “at risk” 4-year-olds. Early childhood educators were trained to implement a 10-week program delivered for 20-minute sessions, four times a week, in their classrooms. The program focused on phonological awareness beginning at the level of letter-sound knowledge and advancing to blending and segmenting constituent phonemes in words. Pre- to post-treatment comparisons of phonological awareness and letter knowledge skills indicated that children in the experimental group made significant gains in comparison to the control group in phoneme blending and letter knowledge. Children in both groups showed pre- to post-treatment gains on the majority of measures, but these tended to be more marked for the experimental group. Limitations of the study, implications for clinical practice and future research are discussed.

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I would like to begin by acknowledging the influence of all previous literature in the field of early literacy and phonological awareness. The boundless research and knowledge that encompasses this field has encouraged me to question and contemplate this field furthering my passion in this area.

Secondly, I would like to thank supportive professors, committee members and advisors who have shared with me their vast knowledge and wisdom, encouraging and challenging me to strive to improve myself and my work.

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Heather M. Osterhouse

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CHAPTER I

INTRODUCTION

Researchers have examined the details of phonological awareness tasks and their effects on subsequent literacy and reading development in students of varying ages, socio-economic status, and educational levels. With more pressure being placed on teachers and students to perform well in the classroom, by laws such as the No Child Left Behind Act (No Child Left Behind [NCLB], 2002), providing early childhood educators with the knowledge they need to successfully prepare their students to learn remains a priority.

Phonological awareness is the knowledge that speech sounds of a language, known as phonemes, have meaning and may be manipulated and combined with other phonemes into syllables, words and sentences. Phonological awareness describes the skill one has to perceive, analyze and manipulate the sounds spoken in words and to understand that words and syllables are created by sequences of sounds. The reflection on and manipulation of these sequences of sounds, separate from their meaning, creates the basis for learning more complex language and literacy skills. In the hierarchy of skills necessary for one to learn how to read and become a literate individual, phonemic and phonological awareness lay the foundation. The knowledge that sounds provide meaning when combined into syllables and words supports

literacy skills such as phonics, reading fluency, vocabulary and ultimately comprehension (Bus & VanIJzendoorn, 1999; Lonigan, Burgess & Anthony, 2000).

Beginning in preschool, typically developing children gradually become aware of words and syllables, and are often able to sort words by their beginning sound. Some studies suggest that the majority of 4-year-olds, without explicit instruction, should exhibit knowledge of syllable segmentation and awareness of onset and rime, onset being the first consonants in a word, and rime being the first vowel and sounds thereafter (Burt, Holm & Dodd, 1999; Dodd & Gillon, 2001). By kindergarten, typically developing children naturally acquire rhyme knowledge to judge, match and generate rhyming words. In addition, these children are able to match beginning and final sounds in words, and segment initial and final sounds in words. Subsequently in first grade, children acquire blending and segmenting of sounds in words (Scheule & Boudreau, 2008). These skills, along with letter-sound knowledge and exposure to orthographic symbols corresponding to sounds, contribute to literacy acquisition. Lyon (1995) stated that the best predictor of reading difficulty in kindergarten or first grade is the inability to segment words into syllables and syllables into constituent sound units (phonemic awareness). Without the knowledge that letters correspond with sounds that create words, which in turn create meaning, reading and literacy would be impossible.

Many research studies have examined the effects of phonological awareness instruction implemented in a variety of ways and with varying developmental levels and ages of children (Bus & van IJzendoorn, 1999; Ehri, Nunes, Willows, Schuster,

Yaghoub-Zadeh & Shanahan, 2001). Research is dominated by studies focusing on typically developing kindergarten and school-age children, children with delays or disorders, children taught in small groups or whole-classrooms, and instruction provided by teachers or therapists. The present study, however, will provide information about instruction focused at the whole-classroom level for pre-kindergartners by trained early childhood educators whose classes may contain children “at-risk” for future literacy difficulties due to speech-language delays or low socioeconomic status.

The purpose of this study was to examine the effects of a focused and concentrated phoneme awareness instructional program for 4-year-olds (pre-kindergartners), provided by early childhood educators to their whole classroom. Participants and their teachers enrolled in licensed, high-quality early childhood programs affiliated with Kalamazoo County Ready 4s, participated in a 10-week instructional program, delivered in 20-minute sessions, four times a week. Explicit instruction focused on phonological awareness beginning from letter-sound knowledge, incorporating orthographic symbols combined with their sounds, and advancing in difficulty to blending and segmenting constituent phonemes in words. Children’s speech, language, and phonological awareness skills were assessed prior to the beginning of the program; phonological awareness skills were monitored at mid-year and again at the end of the pre-kindergarten year.

The information obtained in this research may be of value in the future for understanding the impact of intensive, teacher-implemented phonological awareness

instruction for pre-kindergarten children with and without disabilities. This knowledge may ultimately influence the educational framework for children's phonological awareness learning at younger ages, facilitating exposure to these core language concepts in an engaging environment, thus providing a stable foundation for future learning.

The following literature review will provide a historical perspective on research in the development of phonological awareness with examination of common intervention targets, implementation methods, and different populations. The gap in research regarding the particular dimensions of concentrated, teacher-implemented instruction for typically developing 4-year-olds in integrated classrooms led as motivation for the present study.

CHAPTER II

LITERATURE REVIEW

Historical Perspective

Throughout the past half century, studies examining early phonological awareness abilities have largely shown that these skills are correlated with later success in learning to read (Lundberg, Olofsson, & Wall, 1980). Phonological awareness (PA) is the explicit awareness of the sound structure of spoken words. It is the ability to listen, identify, reflect on and manipulate the sounds within words separate from the meaning of the word itself. It is the skill of understanding that spoken words and syllables are made up of sequences of speech sounds (phonemes), and that these can be changed, separated, and combined in a plethora of ways to create unique and meaningful language.

Phonological awareness knowledge has been documented to be a critically enabling skill for reading acquisition and an important factor in emergent literacy (Whitehurst & Lonigan, 1998). Emergent literacy encompasses the primary skills children acquire prior to learning how to read and write. These skills include; vocabulary knowledge, conventions of print, knowledge of letters, linguistic awareness - most importantly focusing on phonological awareness, phoneme-grapheme correspondence (letter-sound knowledge), emergent reading (pretending to read), and emergent writing (pretending to write) (Whitehurst & Lonigan, 1998). These skills form the base of the literacy continuum, setting a foundation for later

fluent literacy involving comprehension and formulation of complex text. More recently, Gillon (2007) has reported that phonological awareness is essential for the development of reading and spelling and that specific awareness of phonemes is highly predictive of later reading and writing success.

Developmental Progression

In addition to the knowledge that phonological awareness skills are necessary for future literacy development, it is important to understand the developmental progression of such skills. Typically, phonological awareness skills emerge beginning at 3 or 4 years of age and continue developing through ages 6 or 7 (Lonigan, Burgess, Anthony & Barker, 1998). Phonological awareness development typically follows a hierarchy from simple to more complex in a variety of tasks. As children grow older, they become increasingly more aware of smaller parts of words.

Scheule and Boudreau (2008) describe the tasks of phonological awareness in order from least to most complex beginning with the knowledge that whole words are separate from one another. The following, slightly more complex tasks, involve the knowledge that words can be segmented into syllables, and the ability to recognize rhyme. During the early preschool years, songs and nursery rhymes often introduce rhyming to children. The skill of rhyme awareness constitutes knowledge of identifying the onset and rime of a word. A word's onset describes the sound or sounds before the first vowel in a word. The rime contains all of the sounds after the onset, including the vowel. For instance, in the word "cat" the onset is "c" and the rime is "at," or in the word "skate," "sk" is the onset and "ate" is the rime. The next

skill, increasing in complexity, is identifying alliteration, which involves the ability to listen, identify and recognize the initial sound and more challenging, the final sound in words. With this skill, one would be able to identify whether two words begin with the same sound or if the beginning sounds are different. Hierarchically next to develop is the ability to segment the initial or final sound in a words. Putting together (blending) and taking a part (segmenting) a word by its individual sounds takes a high level of awareness of sounds and metalinguistic thought. Phoneme blending requires a sequence of separately spoken sounds to be combined to form a recognizable word. Phoneme segmentation requires separating a word into its individual sounds (Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh & Shanahan, 2001). Following blending and segmenting phonemes, manipulation and deletion of phonemes compose the highest level of phonological awareness and involve a reciprocal developmental relationship with the early stages of reading. For an individual to participate in the task of phoneme manipulation, one must be able to identify a sound or sounds, manipulate these sounds by adding, removing or transposing sounds from words, and infer meaning from the various sequences of sounds.

Instructional Targets

An area of variability between studies is often the content of instruction. A meta-analysis of phonological awareness experimental studies (Bus & Van IJzendoorn, 1999) reports that gains are more consistent and robust when phonological awareness skills are trained together with orthographic symbols and letter-sound correspondence indicating that phonological awareness instruction is

more effective when taught with letters. These researchers suggest that having a visual cue along with the auditory cue of spoken sounds facilitates the discrimination of phonemes and draws children's attention to the sounds in spoken words.

Phonological awareness, taught concurrently with letter awareness and knowledge, has been found to benefit later reading success (Ehri et al., 2001). Other studies report that there are significant positive benefits for later reading and spelling development when children's phoneme awareness and letter knowledge are simultaneously facilitated (Burgess & Lonigan, 1998). A number of longitudinal studies suggest that phonological awareness instruction during the preschool years benefits the development of letter-name and letter-sound knowledge, and such instruction reciprocally supports and predicts future decoding skills in reading tasks (Burgess & Lonigan, 1998; Frost, 2001; Webb, Schwanenflugel & Kim, 2004). A study by Schatschneider, Francis, Foorman, Fletcher, and Mehta (1999) reports that phonological awareness tasks should be taught from easy to more difficult, beginning with identifying the name of pictures beginning with the same sound, blending onset-rime units into real words, blending phonemes into real words, deleting a phoneme and saying the word that remains, segmenting words into phonemes and blending phonemes into non-words.

Contrastingly, Anthony and Francis (2005) explain that acquiring phonological awareness skills is not a single-step progression of learning, but repetitive and circular. As children learn new phonological awareness skills, they continue to refine earlier learned phonological awareness skills. Children who may

have been exposed to a skill will continue to develop learning the skill with repeated experiences. In addition, Ehri et al. (2001) suggest that teachers should not only take into account the difficulty of these beginning phonological awareness skills when deciding what phonological awareness skills to teach first, but how to apply these phonological awareness skills in meaningful ways for students.

Research Population

Phonological awareness research studies often aim focus on a combination of dimensions including age, target population, implementation method and implementation intensity. Some research suggests that the age of implementation affects outcome measures and that beginning phonological awareness instruction with children as young as three will have positive effects on later literacy outcomes (Gillon, 2005). A meta-analysis of multiple phonological awareness experimental studies (Bus & Van IJzendoorn, 1999) suggests that preschoolers tend to benefit more from phonological training than students in kindergarten or primary school. These findings indicate that there is no reason to postpone phonological awareness instruction until kindergarten age. Phillips, Clancy-Menchetti and Lonigan (2008) mention that regardless of a child's initial phonological awareness abilities, he or she can make substantial progress in learning phonological awareness skills. Additionally, these researchers suggest that it is important to adjust instruction for individual skills. Some children may be more proficient in certain areas of phonological awareness and the alphabetic principal than others; challenging these

children in their zone of proximal development is crucial for their continued success, as is adjusting for children who have little or no phonological awareness skills.

Ample research suggests that pre-kindergartners are able to learn phonological awareness skills, yet much of explicit phonological awareness instruction remains aimed at 5-year-olds, when most children enter the public education system.

Recently, Carson, Gillon and Boustead (2013) studied teacher-implemented intensive, classroom phonological awareness instruction for 5-year-olds, with methodology similar to our current study. These researchers report that the 5-year-olds who received the 10-week instruction demonstrated an increase in literacy outcomes, implying that this instruction can help increase literacy skills of typically developing children as compared to children attending the “usual” curriculum. Positive results involving 5-year olds in whole-classroom, teacher-implemented intensive phonological awareness instruction, leads as motivation for research methodology focusing on a younger population.

Referencing current published phonological awareness intervention programs, such as Gillon’s Phonological Awareness Training Programme (Gillon, 2008), Road to the Code: A Phonological Awareness Program for Young Children (Blachman, Ball, Black & Tangel, 2000), Ladders to Literacy: A Preschool Curriculum, Second Edition (Notari-Syverson, O’Connor & Vadasy, 2007), LiPS-4 (LiPS: The Lindamood Phoneme Sequencing Program for Reading, Spelling, and Speech, Fourth Edition (Lindamood & Lindamood, 2011), and Read it Again-PreK! (Justice & McGinty, 2009), three out of five of these programs are designed for children

beginning at age five, with only two intervention programs targeting children as young as four. Of the two interventions targeting children as young as four, neither provides intensive, explicit instruction focused on phonological awareness. The observation that a considerable body of research suggests that younger children can learn early phonological awareness skills, but published intervention programs are mainly aimed at older children, indicates a need for research on instructional programs that are implemented in the pre-kindergarten year, at four years of age.

In addition to phonological awareness instruction aimed at 5-year-olds, much research regarding phonological awareness focuses specifically on children with delays, disorders or “at risk.” Justice, McGinty, Cabell, Kilday, Knighton, and Huffman (2010) studied whole-classroom language and literacy instruction for children with low language abilities and typical to high language abilities aged 3;3 to 5;6 (year; month). This study reported that those individuals with low language abilities did not increase phoneme awareness or alphabetic knowledge to the same degree as those with typical to high language abilities; however, overall there was a positive impact on phoneme awareness and alphabetic knowledge. In addition, these researchers recommend the inclusion of explicit instruction focused on phoneme skills as opposed to syllables and rhyme, as a part of classroom programs to enhance the gains made in phoneme awareness.

Ehri et al. (2001) suggest that one-to-one or small group instruction can exert a positive effect on the early literacy abilities of children with spoken language impairments. As reported by Tyler, Gillon, Macrae and Johnson (2011), children

with co-occurring speech and language impairments receiving small group instruction focusing on phoneme awareness and speech sound production made statistically significant gains in phonological awareness, alphabetic knowledge and oral language skills. Van Kleeck, Gillam and McFadden (1998) analyzed preschool children with speech and/or language impairments who received small group instruction in rhyming and phoneme awareness for a school year. Results revealed that preschool children with speech and/or language impairments made significant improvements in rhyming and phoneme awareness compared to a control group that received the “usual” academic curriculum.

It has also been noted that children from mid to high socioeconomic status (SES) outperform children from low socioeconomic status on many phonological awareness tasks, possibly indicating that there is less exposure to these activities (Lonigan et al., 1998). Ehri et al. (2001) observe in their meta-analysis that many studies do not define “at-risk” similarly and this could contribute to conflicting results when comparisons are made among research studies involving “at-risk” variables. Some studies indicated “at risk” to mean those with low phonological awareness scores pre-intervention, while other studies define individuals “at risk” as those coming from low socioeconomic status. One must infer carefully when determining a study describes students as “at risk” and judge accordingly. In this current study, we define “at risk” as those identified in low SES conditions and those with speech and language difficulties.

In summary, research reveals positive effects from phonological awareness interventions aimed at typically developing children in preschool and kindergarten, children with speech and language impairments, and those considered “at-risk” due to low SES and low phonological awareness or language skills.

Implementation Methods

Phonological awareness intervention may be implemented through individual, small-group or whole-classroom configurations. Koutsoftas, Harmon and Gray (2009) reported the effect of small group phonemic awareness intervention for preschoolers categorized as coming from low-income households. Teachers and speech-language pathologists provided six weeks of small group intervention twice weekly, focusing on beginning sound awareness and resulting in an increase in preschoolers’ phonemic awareness skills.

A meta-analysis evaluating the effects of whole classroom instruction provided by teachers who received training concluded that classroom teachers can teach phonological awareness effectively with additional instruction (Bus & van IJzendoorn, 1999). Programs such as Ladders to Literacy (Notari-Syverson, O’Connor, & Vadasy, 1998), Road to the Code (Blachman, Ball, Black & Tangel, 2000), Phonemic Awareness in Young Children (Adams, Lundberg, Foorman & Beeler, 1998) and The LIPS Program (Lindamood & Lindamood, 1998) are among those that have been successfully implemented in integrated classrooms.

A recent study by Baillet, Pepper, Murphy, Piasta and Zettler-Greeley (2013) examined the effects of emergent literacy intervention for small groups of pre-

kindergarten children at-risk for reading failure. Intervention consisted of 30-minute small-group lessons, twice weekly for 9 weeks focusing on emergent literacy skills of rhyming, alliteration, picture naming and letter knowledge skills. This study defines “at-risk” children as those with low performance on early literacy measures and low socioeconomic status. Results showed significant treatment effects for phonological awareness, alphabet knowledge, and vocabulary skills for these pre-kindergartners in the first year, with continued positive impact on these students in the subsequent two years. These results support the claims that pre-kindergartners can increase their phonological awareness, early literacy and vocabulary skills with small group instruction. Recently, in a non-randomized quasi-experimental design, Currier (2012) compared two classrooms of children ages 4;8 to 5;5 who received whole-classroom and supplemental small group instruction in phonological awareness and vocabulary. The treatment group performed significantly better than the control group on trained phonological awareness attributes and semantic attributes. The combination of these results may suggest that both whole-classroom and small group instruction may benefit pre-kindergarten children’s acquisition of phonological awareness skills.

Phonological awareness intervention research has also varied in duration and intensity. With regard to intensity of explicit phonological awareness instruction, Ehri et al. (2001) found that effect sizes were larger when phonological awareness instruction lasted between 5 and 18 hours than when instructional time was shorter or longer, and that sessions should not exceed 30 minutes in length to be effective. Frequent and intensive sessions are considered an important variable in effective

phonological awareness instructional programs (Elbaum, Vaughn, Hughes, & Moody, 1999; Gillon, 2004). McIntosh, Crosbie, Holm, Dodd, and Thomas (2007) describe the benefits of a short, highly intensive (10-week, daily) and broad phonological awareness program focusing on syllable segmentation, rhyme identification, and initial sound identification for preschoolers from low SES backgrounds. Results indicated significant improvements in phonological awareness knowledge immediately following instruction, but not in follow-up measures of literacy in early school years. These researchers propose the question of whether a similar 10-week, highly-intensive period of instruction focused on the phoneme level, as opposed to syllable and rhyme instruction, could have had more significant long-term benefits for literacy development in the early school years.

Review of research in phonological awareness instruction reveals an abundance of valuable information regarding the many variables researchers manipulate, whether it is the target population, implementation method, or instructional intensity and content. Previous studies have addressed one variable or multiple variables, but have not addressed this specific combination of variables. The primary question posed for the present study was, compared to similar peers in a waiting control group, how do 4-year-olds in a preschool setting who receive intensive, teacher-implemented instruction perform on phonological awareness measures? Central to this study was the targeted population age of 4-years-old, a younger age than many have considered for explicit, complex, phoneme-specific instruction. Inquiring about whether 4-year-olds can improve phonological awareness

skills when explicitly taught by trained early childhood educators was the main focus in this study.

Aligning with the primary question, the hypothesis of the present study stated that phonological awareness instruction focused at the phoneme level would have a positive influence on phonological awareness skills in 4-year-olds. Concurrently, without phonological awareness instruction focused at the phoneme level, there would be a small or no influence on phonological awareness skills in 4-year-olds receiving typical preschool instruction.

CHAPTER III

METHODS

Design

A quasi-experimental design was used to investigate phonological awareness of four-year-old children who received a teacher-implemented phonological awareness program or the “usual” curriculum during their pre-kindergarten year. This design included a delayed-treatment approach whereby site A was randomly selected as the treatment group and site B was the no-treatment control group. Participants at site A received the instruction from September to December, 2012 and those at site B subsequently received instruction from January to April, 2013. The present study involves analysis of performance during the period from September to December, 2012.

Participants

A sample of twenty-four children between the ages of 3;10 (years; months) and 4;11 along with their teachers from two preschool sites participated in this study, fourteen children attended site A and ten children attended site B. (see Table 1). Both sites were located in the same county and were affiliated with Kalamazoo County (KC) Ready 4s and were reportedly low to mid SES. KC Ready 4s is a non-profit organization based in Kalamazoo County, whose main purpose is to prepare preschool children for academic success through access to high quality early

childhood education. To be considered “high-quality” these sites must rank 4-5 stars on a 5 star rating of the Michigan Quality Rating & Improvement System, use one of the State of Michigan’s approved curriculum models, and offer prekindergarten for 3 hours a day, 5 days a week for 33 weeks a year.

Table 1

Age and Gender of Student Participants

Site A		Site B	
Age (year;month)	Gender	Age (year;month)	Gender
4;1	Male	4;5	Female
4;9	Unavailable	4;5	Female
4;4	Unavailable	4;0	Male
4;6	Female	4;7	Male
4;5	Female	4;7	Female
4;8	Female	4;8	Female
4;4	Female	4;0	Male
4;5	Female	4;0	Male
4;9	Male	3;10	Male
4;2	Male	4;4	Female
4;0	Unavailable		
4;4	Female		
4;7	Female		
3;10	Female		

Teachers were recruited from three eligible center-based early childhood classrooms with low to mid SES levels from the 11 KC Ready 4s sites. Teachers were provided information about the study, including an initial description of the study and a consent form provided at an administrative meeting held by KC Ready 4s Executive Director at their preschool. Four teachers and two teacher assistants agreed to

participate and returned consent forms via mail to the KC Ready 4s Executive Director. Child participants were chosen from the classrooms of the teachers who volunteered and consented to participate in the study. KC Ready 4s Executive Director and the research project coordinator, a certified speech-language pathologist (SLP), also held an initial meeting with parents asking their permission for their child to participate in the study. At this meeting, parents had an opportunity to ask questions, and were encouraged to contact the faculty research director via e-mail or phone to inquire further about the study and their child's participation. Child participants were required to: (1) be four years of age; (2) have written parental permission to participate in the study; and (3) have no sensory, neurological, and physical abilities that required specialized equipment to achieve accurate testing. Parents consented to have their child's data used for research purposes (see Appendix B).

Assessments

Child participants received a comprehensive baseline assessment of their speech, language, phonological awareness and early literacy skills, as well as follow-up assessments at the middle (December) of the school year to monitor gains made in phonological awareness and early literacy skills. The assessments were provided by the certified SLP coordinating the project, assisted by 15 graduate clinicians under her supervision. Graduate student clinicians, with previous academic exposure and clinical experience performing standardized assessments volunteered to participate in assessments. These graduate students attended a meeting to review standardized

assessment protocols, detailed scripts and video examples of the non-standardized assessment probes prior to administering assessments. During assessments, the certified SLP coordinating the project was available if any questions arose. Initial assent was given by each child prior to administering testing (see Appendix C). Each individual assessment was conducted in an isolated room and breaks were given to the students as needed.

A hearing screening was administered to each student to rule-out concerns about hearing loss. *The Goldman Fristoe Test of Articulation - Second Edition* (GFTA-2, Goldman & Fristoe, 2000) Sounds-in-Words subtest was administered to identify speech-sound errors. *The Clinical Evaluation of Language Fundamentals-Preschool Second Edition* (CELF-P2, Wiig, Secord, & Semel, 2006) Core Language Subtests were administered to determine overall language performance. The *Pre-Reading Inventory of Phonological Awareness* (PIPA, Dodd, Crosbie, McIntosh, Teitzel, & Ozanne, 2003) subtests; Alliteration Awareness, Sound Isolation and Letter-Sound Knowledge were administered to assess phonological awareness skills. Standardized assessments were chosen based upon their frequency of use in clinical practice, as well as in previous research regarding phonological awareness.

For all of these tests, the child was asked to: point to pictures in response to oral directions; complete a sentence with the correct form of the word, such as using endings on words; identify an object, person or activity portrayed in a picture; follow simple directions; or repeat sentences spoken by the examiner. Results displayed in Appendices D and E, were provided to parents and classroom teachers.

Outcome Measures

The construct of phonological awareness (PA) was measured through non-standardized phonological awareness tasks designed by Gillon (2005) at pre-test (September) and post-test (December). These tasks were specifically scripted for accuracy among clinicians during assessment procedures. Measures of rhyme detection, phoneme identity in isolation, phoneme identity with words, letter name, letter knowledge, phoneme blending, and phoneme segmentation were administered individually at pre-test and post-test.

Rhyme detection measures required the child to identify rime oddity, the spoken word associated with a picture that did not rhyme. Phoneme identity measures required the child to identify a picture that began with the same sound as the target sound, given verbal and visual models. Letter name measures required the child to point to a lower case letter name (i.e., “find the letter b”) among other lower case letters. Phoneme identity with words measures required the child to identify the word that began with a given target sound. Phoneme blending measures required the child to listen to sounds spoken by the clinician separately and to put those sounds together to create a word. Phoneme segmentation measures required the child to listen to a word and separate it into its individual sounds. Finally, letter knowledge measures required the child to identify all of the upper case letters when each was spoken by the clinician.

For each of these tasks, the number of correct responses and the percentage correct were recorded. Each phonological awareness measure had two practice items

to teach the task and 10 or 12 possible opportunities for the child to correctly respond.

All scores were recorded on a corresponding form and subsequently checked for scoring accuracy by the research project coordinator.

Phonological Awareness Instruction

The experimental group (site A) received explicit phonological awareness instruction conducted by their classroom teacher for ten weeks. The investigator for this study, another graduate student, the research director and project coordinator conducted weekly, hour-long meetings with the classroom teachers to review results of the previous week, give feedback, and to explain the next week's intervention goals and materials. The control group received typical classroom instruction led by their classroom teacher. While instruction was not being implemented at site A, both classrooms implemented the HighScope Preschool Curriculum, a curriculum approved by KC Ready 4's to ensure high quality early childhood education. This curriculum incorporates child-initiated learning in all subject areas of language, literacy, mathematics, creative arts, science and social studies. All students were post-tested with the phonological awareness measures in December 2012, when the intervention was completed for site A.

Teacher Training

Initial training occurred through a lecture-style workshop for early childhood educators in the Kalamazoo County area. An e-mail was sent to all early childhood educators associated with the KC Ready 4s, and those interested attended the

workshop for continuing education credits. The lecture-style workshop was presented by the investigator, another graduate student and project coordinator in September, 2012. Training focused on explaining phonological awareness, its typical development, teaching techniques, such as modeling, expanding and rephrasing, how to respond to correct and incorrect responses, and role-play activities similar to those used in the experimental study.

Throughout the length of the 10-week instructional program, one lead teacher and two assistant teachers attended additional, weekly mentoring meetings with the investigator, another graduate student and research project coordinator. These hour-long mentoring meetings addressed the review of weekly lesson plans, activities, materials and instructions. This meeting also allowed for communication between the investigators and the teachers to prepare for the next week's lessons. The other lead teacher was shown the instructions on a subsequent day and was encouraged to contact the project coordinator with any questions pertaining to the lessons. The investigator also completed a simple instruction log that recorded the teachers' assessment of the instruction provided, attendance, and impression of children's responses; this log took 5-10 minutes to complete (see Appendix G). Additional instruction, explanation and support were provided as needed to address concerns with activities or student progress. Teachers were encouraged to ask questions regarding the program and activities, voice opinions about what worked well and what did not work well, and discuss students' participation. Modifications and additional suggestions to increase student participation were determined by the

teacher's perception of the children's level of performance during the instructional sessions.

Instruction began in September after the initial testing finished. The program was implemented for 20 minute sessions, 4 days a week, Tuesday through Friday for ten weeks. Each week, the teachers were provided lesson plans and instructional materials for that week (see Appendix F). Weeks 1-4 focused on letter-sound awareness, weeks 5 and 6 focused on phoneme identification, weeks 7 through 10 focused on blending and segmenting (see Table 2).

Program

The program developed for this study, adapted from Gillon and McNeill (2007), consisted of 10 weeks of whole-classroom instruction beginning with letter-sound knowledge. For the first four weeks of instruction, three letters and their corresponding sounds were targeted for two sessions a piece. Letter and sound stimuli were selected to follow a developmental progression and grouped together by maximally different productions within the oral cavity. Activities for targeting letter-sound knowledge began with introducing the letter, showing the children a picture of the letter, and demonstrating the sound associated with the letter. Along with the presentation of the letter, children voluntarily participated in labeling the letter and producing the sound associated with the letter. In a letter-sound search activity, teachers encouraged the children to listen to a sound the teacher produced and to place their bean bag in the corresponding letter bin. Letter matching activities provided children with the opportunity to have the targeted letter cards in their hand

and to match them to corresponding large letters in the front of the classroom. These activities provided multi-sensory input through explicit, engaging, age-appropriate instruction.

For weeks five and six, the teachers presented the children with the task of identifying initial phonemes in words. Teachers introduced the new task of identifying the first sound of a word by introducing the target sounds with their corresponding animal friend, for example, the letter “H” corresponded with “Henry the Hippo.” Children matched toys and picture cards whose names began with the same sounds as the target sounds of the day. Activities such as a treasure hunt, mystery bag, and chef’s soup incorporated play with the children’s task of identifying the initial phoneme in words. In the mystery bag activity, children pulled pictures or toys out of a bag, and labeled them. Next, the child identified the beginning sound and determined if it was the same or different from the target sound. These activities were adapted for use within whole-classroom instruction and reinforced the children’s ability to match and identify the initial sounds of words.

During week seven, teachers introduced blending and segmenting of compound words. Activities for these tasks included visual puzzles where compound words were represented by pictures that were cut in half. Children were required to combine the two pictures to create a compound word. In addition, the teacher and children played listening guessing games where the teacher would say two words separately and the children would listen and combine the two words to create a compound word. Multisensory activities such as clapping, jumping, tapping and the

use of visual aids supported the new tasks of blending and segmenting. During week eight, the teachers introduced onset-rime blending and segmenting, a more difficult skill. In these tasks, children identified the first sound(s), or onset, in a word, and segmented the sound(s) from the rime or blended the sound(s) onto its rime. Finally, in weeks 9 and 10, teachers introduced phoneme blending and segmenting, a difficult level of phonological awareness. Teachers encouraged children to attend to each individual sound in a word consisting of a consonant, vowel and consonant (CVC). Words involving a consonant, vowel and consonant provided an appropriate beginning level task of phoneme blending and segmenting.

The following table displays the sequence of activities in the instructional curriculum. Each row provides information for the four days of activities for that particular week. Many of these activities were repeated so that children would not need to focus on learning the activity, but on the new material being presented each day. Early childhood educators were given more detailed scripts and materials explaining the letters, sounds and words to be taught during each particular session.

Table 2

Weekly Instructional Log of Activities

Weeks	Day 1	Day 2	Day 3	Day 4
	Goal: Letter Sound Knowledge			
1-4	1. Letter/Sound Demonstration 2. Letter/Sound Search 3. Letter Matching	1. Review Letter/Sounds 2. Mystery Bag Activity 3. Letter Bingo	1. Letter/Sound Demonstration 2. Letter/Sound Search 3. Letter Matching	1. Review Letter/Sounds 2. Letter Matching 3. Letter memory
	Goal: Initial Phoneme Identification			

Table 2-continued

5-6	1. Animal Character 2. Mystery Bag 3. Categorization	1. Animal Character 2. Treasure Hunt 3. Chef's Soup	1. Animal Character 2. Mystery Bag 3. Categorization	1. Animal Character 2. Treasure Hunt 3. Chef's Soup
Goal: Segmenting Compound Words				
7	1. Introduce Blending Compound Words 2. Blending Song 3. Guess the word Bingo 4. Puzzle Partner	1. Blending Compound Words 2. Blending Song 3. Guess the word Bingo 4. Puzzle Partner	1. Introduce Segmenting Compound Words 2. Segmenting Song 3. Puzzle Partner	1. Introduce Segmenting Compound Words 2. Segmenting Song 3. Puzzle Partner
Goal: Segmenting Onset-Rime				
8	1. Introduce Onset-Rime Blending with Magic Writing 2. Find Your Puzzle Partner	1. Introduce Onset-Rime Blending Magic Writing 2. Puzzle Partner	1. Introduce Onset-Rime Segmenting with Puppet 2. Blast Off 3. Puzzle Partner	1. Onset-Rime Segmenting with Puppet 2. Blast Off 3. Puzzle Partner
Goal: Segmenting Phonemes				
9	1. Introduce Sounds of Words: Elkonin Boxes 2. Puppet Talk	1. Sounds of Words: Elkonin Boxes 2. Puppet Talk	1. Phoneme Segmenting 2. Bingo 3. Cheer	1. Phoneme Segmenting 2. Bingo 3. Cheer
10	1. Introduce Sounds of Words: Elkonin Boxes 2. Magician's Bag	1. Introduce Sounds of Words: Elkonin Boxes 2. Blending Bingo	1. Phoneme Segmenting 2. Cheer 3. Bingo	1. Phoneme segmenting 2. Segmentation Cheer 3. Bingo

Fidelity

To ensure the content was accurately presented and the program's purpose was maintained, fidelity of the instructional sessions was assessed during the 10 weeks. Of the 40 sessions, 20% were observed to guarantee the phonological awareness tasks were being delivered according to the instructions and activities planned. These observations, in addition to the review of daily logs, resulted in recommended strategies for frequency and documentation of fidelity (Kaderavek & Justice, 2010). The research director and project coordinator compared the lesson plans in contrast

with activities that were completed during instruction to guarantee that the phonological awareness skill that was targeted (e.g., letter-sound knowledge) was the one that was designated for that specific week. Activities were allowed to be slightly altered by the teachers depending on the students' abilities on a given day; however, the phonological awareness skill, and instructional script that was chosen for the week was intended to be the primary target. A total of eight sessions of each teacher group were observed in order to rule out biases and preserve the true nature of the instruction. Of these observed sessions, the research director and project coordinator reported 95-100% compliance in implementation of the designated activity according to scripted instructions.

CHAPTER IV

RESULTS

To test the hypotheses proposed in this study that phonological awareness instruction focused at the phoneme level would have a positive influence on phonological awareness skills in 4-year-olds and concurrently, without phonological awareness instruction focused at the phoneme level, there would be a small or no influence on phonological awareness skills in 4-year-olds receiving typical preschool instruction, descriptive analyses and *t*-tests were used.

Group performances on assessment measures of language, phonological awareness and speech sound production were compared at the start of the school year prior to the beginning of instruction. *The Clinical Evaluation of Language Fundamentals-Preschool Second Edition* (CELF-P2, Wiig, Secord, & Semel, 2006) Core Language Score was used to compare groups on language status, *Pre-Reading Inventory of Phonological Awareness* (PIPA, Dodd, Crosbie, McIntosh, Teitzel, & Ozanne, 2003) subtests of Alliteration Awareness, Sound Isolation and Letter-Sound Knowledge were used to assess phonological awareness status, and the *Goldman Fristoe Test of Articulation Second Edition* (GFTA-2) Sounds-in-Words scores were analyzed to compare groups on speech sound production status. Statistical tests revealed no significant group differences for the CELF-P2 Core Language standard scores and PIPA subtests raw scores ($p = 0.286 - 0.887$), as shown in Table 3. There was, however, a significant difference between the experimental group and the control group on the GFTA-2 Sounds-in-Words subtests ($p=0.02$), as shown in Table 3.

Table 3

Initial Standardized Assessment Results

Initial Assessment Results					
	CELF-P Core Language Score	GFTA-2 Sounds in Words	PIPA: Alliteration Awareness	PIPA: Sound Isolation	PIPA: Letter- Sound Knowledge
Site A (n=14)					
Mean	106.57	112.50*	4.07	4.79	7.86
SD	10.76	8.27	2.37	4.64	8.35
Site B (n=10)					
Mean	110.60	102.90	5.33	6.80	7.40
SD	14.11	9.74	3.43	4.23	7.21

Note: CELF-P2= *Clinical Evaluation of Language Fundamentals-Preschool Second Edition* Standard Score, GFTA-2= *Goldman Fristoe Test of Articulation Second Edition*, Sounds in Words Standard Score, PIPA=*Pre-Reading Inventory of Phonological Awareness* Raw Score. * $p < 0.05$.

Nonstandardized outcome measures of phonological awareness were compared at the start (pre-instruction) and middle of the school year (post-instruction). *T*-tests were used to compare the experimental and control group at pre-instruction. Results confirmed that there were no significant differences between the experimental and control groups' performance on the outcome measures of phonological awareness; rhyme detection, phoneme identity, letter name, phoneme identity with words, phoneme blending, phoneme segmentation and letter knowledge, $t(22) = 0.03 - 1.16, p = 0.21 - 0.97$, prior to instruction, as displayed in Table 4.

T-tests were also used to compare the experimental and control group at post-instruction. Results indicated no significant differences between experimental and

control groups' performance on the outcome measures of phonological awareness, $t(22) = -1.52 - 1.55, p = 0.14 - 1.00$ as displayed in Table 4.

Table 4

Phonological Awareness Outcome Measures for Experimental and Control

	RD	PID	LN	PIDW	PB	PS	LK
Experimental (n=14)							
Pre-Instruction Mean	60.71	52.86	69.07	78.50	57.14	18.57	53.29
SD	27.90	29.70	34.20	27.00	40.70	38.00	35.80
Post-Instruction	65.00	65.00	88.10	92.35	84.30	30.00	83.40
SD	29.30	32.76	22.40	15.40	19.50	36.60	20.00
Control (n=10)							
Pre-Instruction Mean	66.00	67.00	70.00	68.30	74.00	18.00	54.10
SD	28.80	25.40	31.20	30.70	25.00	29.00	39.50
Post-Instruction	65.00	83.00	80.90	85.80	72.00	38.00	68.00
SD	29.50	21.12	19.70	25.40	34.25	49.40	25.30

Note: Table displays means and standard deviations in percentages. RD=rhyme detection, PID=phoneme identity, LN=letter name, PIDW=phoneme identity with words, PB=phoneme blending, PS=phoneme segmenting and LK=letter knowledge

Gain scores were also calculated by subtracting pre-instruction scores from post-instruction scores, thus describing change in percent accuracy on each phonological awareness outcome measure. One-tailed t -tests were performed to compare group gain between the experimental and control group. Results revealed a significant difference in gain between the experimental group's performance on phoneme blending compared to the control group, $t(23) = 1.98, p = 0.03$. These results suggest that compared to a "no instruction" control condition, the experimental group significantly increased their scores on phoneme blending measures from pre- to post-instruction. The difference between experimental and control group gain scores

for letter knowledge approached significance at $t(23) = 1.61, p = 0.06$. There were no significant group differences in gain scores for the remaining phonological awareness outcome measures ($p = 0.15 - 0.31$), as displayed in Table 5. Analysis of gain scores suggests that it is only the more difficult phoneme awareness skill of blending for which the experimental group significantly outperformed the control group; however, analysis of letter knowledge resulted in a positive trend toward significance ($p = 0.06$). Average gain scores for the experimental and control groups on phoneme blending and letter knowledge are displayed in Figure 1.

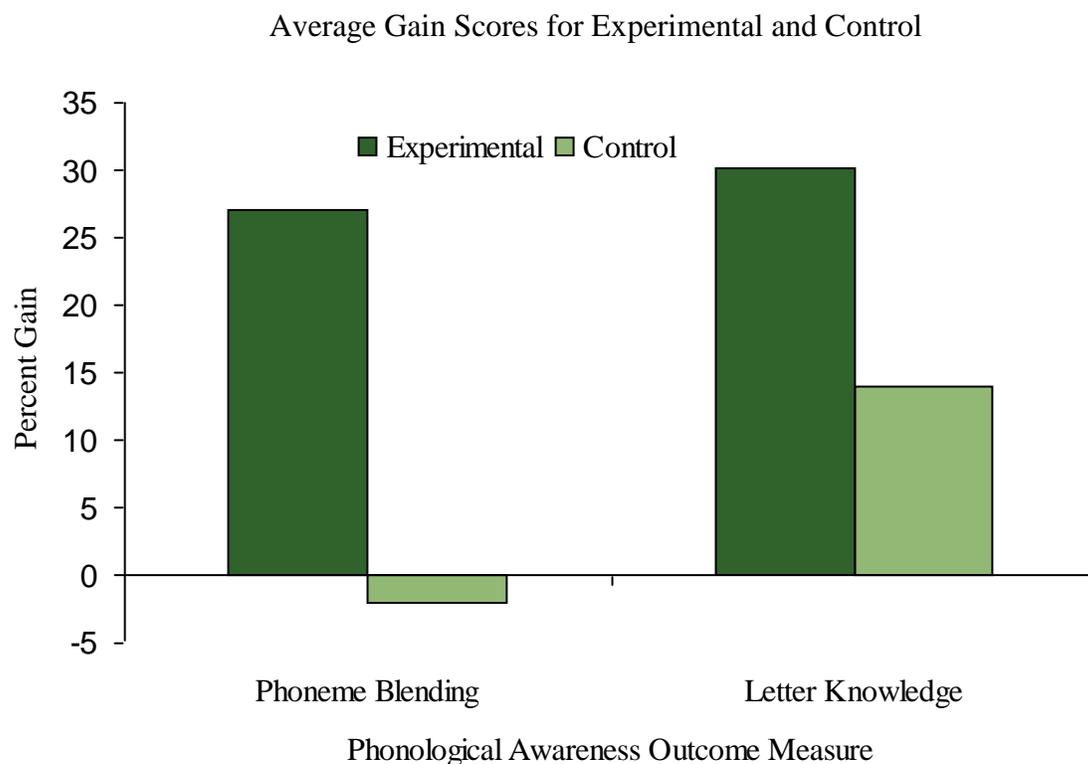
Table 5

Average Percent Gain in Phonological Awareness Measures for Experimental and Control

	RD	PID	LN	PIDW	PB	PS	LK
Experimental (n=14)							
Mean	4.28	12.14	18.86	13.86	27.14*	11.43	30.14
SD	25.93	24.55	21.19	24.13	38.91	24.45	27.05
Control (n=10)							
Mean	-1.00	16.00	10.70	17.50	-2.00	20.00	14.00
SD	24.24	13.49	19.69	31.10	38.24	32.66	25.33

Note: RD=rhyme detection, PID=phoneme identity, LN=letter name, PIDW=phoneme identity with words, PB=phoneme blending, PS=phoneme segmenting and LK=letter knowledge. * $p < 0.05$.

Figure 1



In summary, both the experimental and control groups made improvements in mean accuracy on the majority of phonological awareness outcome measures, though not all statically significant. When comparing gain scores, results showed that the experimental group made significant gains in comparison to the control group on phoneme blending and near significant gains on letter knowledge outcome measures.

CHAPTER V

DISCUSSION

This study investigated the impact of intensive, teacher-implemented phonological awareness instruction for an “at risk” population of pre-kindergarten children. Early childhood educators were trained to implement an explicit, concentrated 10-week program in their classrooms. The quasi-experimental design involved random assignment of two 4-year-old classrooms to either an experimental or waiting control condition.

The main hypothesis stated that phonological awareness instruction focused at the phoneme level would have a positive influence on phonological awareness skills in 4-year-olds and concurrently, without phonological awareness instruction focused at the phoneme level, there would be a small or no influence on phonological awareness skills in 4-year-olds receiving typical preschool instruction. This hypothesis was supported in part by statistical and descriptive analysis of the data. Four-year-olds who received 10 weeks of teacher-implemented instruction focused on phonological awareness skills did make gains on specific phonological awareness outcome measures compared to children receiving the “usual” curriculum instruction. The experimental group’s mean scores for the skills of letter name, phoneme blending, and letter knowledge increased from pre-instruction to post-instruction. In contrast, the control group did not display marked increases in mean scores for these same phonological awareness skills, although did show increases for phoneme

identity and phoneme segmentation. Neither group showed notable change in rhyme detection scores.

With the exception of phoneme blending, mean gain scores were not significantly different between experimental and control groups. There was a trend, however, for the gain in letter knowledge to be greater for the experimental group. Further analysis of letter name and letter knowledge outcome measures between the experimental and control group resulted in positive trends toward significance suggesting that with a larger sample size, and smaller variance, these measures have potential to become significant. The positive results for letter knowledge may have been influenced by having the first four weeks of the instructional program focus on naming letters, identifying letters, and matching them to their corresponding sounds. Repetitive exposure to these skills may have impacted letter name and letter knowledge outcome measures in the experimental classroom.

The finding of a significant group difference in gain scores favoring the experimental group for phoneme blending, in the absence of other significant gains, holds important implications. In the traditional hierarchy of phonological awareness development, phoneme blending remains a more difficult skill, along with segmentation and manipulation of phonemes. Phoneme blending requires students to listen to individual sounds, reflect on the sounds, combine them in the production of one unit, and recognize that unit of sounds as a word. The skills of blending and segmenting were targeted for four weeks of the instructional program, building from compound words, to onset and rime, and individual phonemes. Specific, explicit

instruction focused on phoneme blending and segmenting was only targeted for the last two weeks. Significant improvement in the experimental group on phoneme blending measures with somewhat limited exposure indicates the potential for marked change in performance with explicit classroom instruction. Such skills are not typically targeted in preschool curricula and not targeted in the HighScope Preschool Curriculum; therefore, little change among phoneme blending skills in the 4-year-olds of the control group was expected and confirmed by data analysis. These initial findings hold promise for establishing future preschool intervention protocols enhanced with phoneme blending goals and activities.

Recent research (Ukrainetz, Nuspl, Wilkerson, & Beddes, 2011) confirms that preschoolers can benefit from instruction focused at the level of segmentation and blending without first learning initial sound awareness. Preschoolers who received small-group instruction twice weekly for 4-6 weeks focused on segmentation and blending improved these skills with no negative effects on first sound awareness. These findings support a more efficient way of teaching awareness of individual sounds of speech. Similar to our findings that 4-year-olds can improve understanding of phoneme blending skills, the results of Ukrainetz et al. (2011) suggest it may be more beneficial to spend less time on letter-sound awareness because this exposure occurs in the general curricula, and spend more time on blending and segmenting of phonemes.

An interesting result in the outcome measure of phoneme segmentation was observed; it appeared that the control group made slightly larger gain, although not

significant, compared to the experimental group. In the hierarchy of phonological awareness, phoneme segmentation is a more difficult skill. Analysis of individual segmentation scores revealed that of the 4-year-olds, 8 out of 14, (57%) in the experimental group and 6 out of 10, (60%) in the control group scored 0 at pre-instruction. Of these 4-year-olds scoring 0 on initial outcome measures of phoneme segmentation, five (63%) in the experimental group had increased their score by the end of the instructional period whereas none in the control group had increased their scores. This may indicate that the children in the control group, who did not initially score 0 and whose scores did improve, may have had superior phoneme manipulation skills or had supportive educational influences in their homes or other environments. The fact that the 4-year-olds in the experimental group who had exhibited no understanding of phoneme segmentation improved in this skill at post-instruction suggests that the phonological awareness program was a primary factor contributing to that change.

Many variables in this study may have impacted outcome measures and limitations of the study must be discussed. The result that gain scores were significantly different in favor of the experimental group for only the skill of blending may have been due to several factors. External factors affecting both the experimental and control groups may have contributed to outcome measures. Teacher experience and parent participation were unaccounted for throughout both the experimental and control classrooms. Also, for both classrooms, the HighScope Preschool Curriculum provided exposure to letters and sounds as a part of the “usual”

curriculum. It was also noted that teachers often reported behavioral management difficulties and occasional absences due to sickness that subtracted from pure instructional time, as well.

Another variable possibly affecting outcome measures is the presence of speech and language difficulties among students. Speech and language difficulties were identified in four students, two in each of the experimental and control groups. The two 4-year-olds in the control group with speech and language difficulties did not improve markedly; however, the two 4-year-olds in the experimental group with speech and language difficulties did improve, although their improvements were more variable than their typical experimental peers (Wickham, 2013). This increased variability in response may have further impacted group differences, especially with such small sample classroom sizes.

Design limitations for this study must be acknowledged. In the quasi-experimental design, classrooms were randomly selected, but the individual students were not randomly selected because they were already a part of their individual classrooms. Variability in parent interaction, parent education, teacher experience level and implementation of the usual curriculum may have also been influencing factors. These limitations warrant further investigation through the use of larger sample sizes to obtain more accurate measures of significance.

In summary, providing 4-year-olds with the fundamental basis of knowledge for future reading and academic success is paramount. These findings contribute to the abundance of existing literature on phonological awareness instruction by

providing information about explicit teacher-implemented, whole-classroom instruction focused at the phoneme level for 4-year-olds. The present results suggest that such instruction positively impacts phonological awareness skills and may benefit the future literacy needs of 4-year-olds.

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Appendix A

HSIRB Approval Letter

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: August 14, 2012

To: Ann Tyler, Principal Investigator
Heather Osterhouse, Student Investigator for thesis

From: Amy Naugle, Ph.D., Chair 

Re: HSIRB Project Number 12-06-08

This letter will serve as confirmation that your research project titled "Classroom Phoneme Awareness Instruction: Early Literacy Outcomes" has been **approved** under the **expedited** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study."*** Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: August 14, 2013

Appendix B

Parental Consent Form

Western Michigan University
Department of Speech Language Pathology and Audiology

Principal Investigator: Ann A. Tyler, Ph.D.
Project Coordinator: Jayne Trombley
Student Investigator: Heather Osterhouse, Katherine Wickham

Title of Study: Classroom Phoneme Awareness Instruction: Early Literacy Outcomes

Your child has been invited to participate in a research project entitled “Classroom Phoneme Awareness Instruction: Early Literacy Outcomes.” This project will serve as Heather Osterhouse’s and Katherine Wickham’s theses for the requirements of a Master’s Degree in Speech Language Pathology. This consent document will explain the purpose of this research project and will go over all of the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

What are we trying to find out in this study?

The purpose of the study is to examine the effects of an intensive classroom-based instruction focused on awareness of the sound structure of spoken words (phonological awareness) for 4-year-olds. We are trying to find out if standard phonological awareness instructional practices when delivered by teachers with a focus on the phoneme (individual sound) level, and in an intensive schedule will lead to significant gains in pre-literacy skills for both typically developing children and those with speech and language impairments.

Who can participate in this study?

Up to 32 children from eligible licensed KC Ready 4s programs and whose classroom teachers volunteer as participants will be eligible to participate in this study.

Your child may participate if he/she: (1) is four years of age; (2) has your written permission to participate in the study; and (3) does not require specialized equipment to participate in testing.

Where will this study take place?

Assessments and instruction will take place at the early childhood program sites.

What is the time commitment for participating in this study?

Your child will receive an initial comprehensive assessment and additional assessments to monitor progress at the beginning, middle, and end of the school year. The initial baseline assessment will take approximately two hours and other assessments will take one hour each. The intensive classroom instruction will take place for 10 weeks during regular class time and students will receive this instruction either in the fall or spring semester of the year.

What will you be asked to do if you choose to participate in this study? Your child will be asked to participate in a speech, language, and early literacy assessment at the beginning of the school year and early literacy assessments at the middle and end of the school year. Children will assent to their participation in the assessments when asked, “Would you look at pictures with me and talk about them with me?” Participants will be audio taped only during the picture naming portion of the speech pronunciation assessment. The purpose of taping is to allow the investigators to re-listen and accurately write out every word (transcribe), to be used later for speech error analysis. You are being asked to have your child’s assessment data used for research purposes.

What information is being measured during the study?

Children’s speech, language, phonological awareness and early literacy skills will be assessed at the beginning of the school year. Post-instructional assessments at the middle and end of the school year will be performed to monitor gains made in phonological awareness, and early literacy skills. These assessments will be provided by a speech-language pathologist (SLP), certified by the American-Speech-Language-Hearing Association, assisted by graduate clinicians under her supervision.

What are the risks of participating in this study and how will these risks be minimized?

The risks of participating in this study are minimal. The only risks anticipated are minor discomforts typically experienced by children when they are being tested (e.g., boredom, mild stress owing to the testing situation). All of the usual methods employed during standardized testing to minimize discomforts will be employed in this study. If a child becomes tired or frustrated, the testing sessions will be interrupted and/or rescheduled.

What are the benefits of participating in this study?

As a result of participating in this study, you will be able to closely monitor your child’s progress in speech, language, and early literacy development. You will be provided with a report of your child’s baseline assessment results. Your child may also benefit by showing increased awareness of the sound structure of our language. The information obtained in this research may be of value in the future for understanding the impact of teacher-implemented phonological awareness instruction for pre-Kindergarten children with and without disabilities. This research may help

determine the immediate and long-term effects of phonological awareness instruction on early literacy performance.

Are there any costs associated with participating in this study?

There is no cost associated with participating in this study.

Is there any compensation for participating in this study?

There is no compensation for participating in this study.

Who will have access to the information collected during this study?

All test data and information will remain confidential. Participants' names will be omitted from all test forms and a code number will be attached. The principal investigator will keep a separate master list with the names of the children and the corresponding code numbers. If the researchers find that test results will be useful for planning children's programming, they will share the results with teachers. Once the data are collected and analyzed, the master list will be destroyed. All other forms will be retained for at least three years in a locked file in the principal investigator's office. No names will be used if the results are published or reported at a professional meeting.

What if you want to stop participating in this study?

You can choose to stop participating in the study at any time for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation. You will experience NO consequences either academically or personally if you choose to withdraw from this study.

The investigator can also decide to stop your participation in the study without your consent.

Should you have any questions prior to or during the study, you can contact the primary investigator, Ann A. Tyler, Ph.D CCC-SLP at 269-387-8054 or ann.tyler@wmich.edu or KC Ready 4s Executive Director, Sandy Standish at 269-366-9140. You may also contact the Chair, Human Subjects Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

Please Print Your Child's Name

Please Print Your Name

Parent/Guardian's Signature

Appendix C

Participant Assent Script

Assent for assessment procedure:

“Hi, _____. My name is _____. Will you come with me to look at pictures and talk about them with me?”

Assent for instructional procedures:

“Will you read books and play games about sounds and letters with your teacher and friends during class time for the next 10 weeks?”

Appendix D

Results of Speech and Language Evaluation

Student's Name: _____ Test Date: _____ Date of Birth: _____

Age: _____ Sex: _____ Grade: _____ Testing Location: _____

Student Clinician: _____ Clinical Supervisor: _____

HEARING SCREENING

The hearing screening provides headphones to a child and introduces a beep tone at differing loudness levels and pitches or frequencies (Hz) for the each ear. In this case, the three screening frequencies chosen are representative of typical levels for conversational speech. The loudness of the tone (20dB) is softer than average classroom speech and noise level. Using this screening measure, if the child passes, it is assumed that she/he hears appropriately for classroom instruction and interaction.

Date:	<u>20dB at 1000Hz</u>	<u>20dB at 2000Hz</u>	<u>20dB at 4000Hz</u>
Right ear			
Left ear			

Comments/Concerns:

PIPA: PRE-READING INVENTORY OF PHONOLOGICAL AWARENESS

Measures a child's phonological awareness skills with subtests: Scores are used to categorize student's achievement at an "emerging/below basic" (0-29th percentile), "basic" (30th-69th percentile), or "proficient" (70th-99th percentile) range of development. Alliteration Awareness assesses a student's ability to identify the word that does not begin with the same sounds as the other words in the same set i.e. baby ball car bubble. Sound Isolation assesses a student's ability to identify the first sound in a word. Letter-Sound Knowledge assesses a student's ability to identify the sound that corresponds with each letter.

PIPA Subtest	Percentile Rank	Category of Achievement
Alliteration Awareness		
Sound Isolation		
Letter-Sound Knowledge		

Comments:

CLINICAL EVALUATION OF LANGUAGE FUNDAMENTALS (CELF-PRESCHOOL)

Three subtests from the CELF-Preschool were administered from which the Core Language Score was derived. The Core Language Score has an average of 100 and this represents the performance of a typically developing child of a given age. This score is considered to be the most representative measure of a child's language skills and provides an easy and reliable way to quantify a child's overall language performance. Each of the three subtests administered were scored on a scaled score. This number can be compared to a mean (average) of 10 with a standard deviation of 3.

Subtests & Index Scores	Scaled Score	Standard Score	Percentile Rank
Sentence Structure			
Word Structure			
Expressive Vocabulary			
Core Language Score			

Sentence Structure: The Sentence Structure subtest is used to evaluate the ability to interpret spoken sentences of increasing length and complexity. For this subtest, _____ was asked to point to the picture that illustrates a given sentence. This subtest can give information about how _____ understands spoken sentences in the classroom and at home. _____ received a scaled score of _____ (percentile rank _____) on the Sentence Structure subtest.

Word Structure: The Word Structure subtest is used to evaluate a child's knowledge of grammatical rules in a sentence-completion task. _____ was asked to complete a sentence that pertains to an illustration using the targeted word structures. Information from this subtest can help determine how _____ is acquiring the morphological rules (grammar) of the English language. _____ received a scaled score of _____ (percentile rank _____) on the Word Structure subtest.

Expressive Vocabulary: The Expressive Vocabulary subtest is used to evaluate a child's ability to label pictures of people, objects, and actions. Information from this subtest can be used to determine how _____ is able to name objects, people, and activities in her home/school environment. _____ received a scaled score of _____ (percentile rank _____) on the Expressive Vocabulary subtest.

Core Language Score

For _____ Core Language score, the following subtests were administered: Sentence Structure, Word Structure and Expressive Vocabulary. _____ received a Core Language score of _____ (percentile rank _____). This score is in the _____ range of developmental functioning.
Comments:

Appendix E

Summary of Speech and Language Results

Student's Name: _____ Test Date: _____ Date of Birth: _____

Age: _____ Sex: _____ Grade: _____ Testing Location: _____

Student Clinician: _____ Clinical Supervisor: _____

Assessment:	Concern?	Comments:
<u>Hearing Screening</u>		
<u>Goldman Fristoe Test of Articulation (GFTA-2)</u>		
<u>Clinical Evaluation of Language Fundamentals- Preschool (CELF-Preschool)</u>		
<u>PreReading Inventory of Phonological Awareness (PIPA)</u>		

Appendix F

Sample Session Instructions

Weeks 1-4 Example: Letter Knowledge: (M A T)**1. Letter and Sound Recognition:**

Place 3 LARGE letter cards on the board for the class to see. Pick up 1 letter card and show the class:

a. This is the letter ___[target sound] and it makes the /___/ sound. Let's make the /___/ sound together.../___/. Great! You made the /___/ sound for the letter ___(holding up the LARGE letter card).

b. Now someone raise their hand and tell me what letter is this?

Right! This is the letter ___.

And someone else raise their hand and tell me what sound does ___make?

Right! The letter ___makes the /___/ sound!

c. Pick up another LARGE card:

Now, I have another letter for us to look at. Look at these letters carefully: do they look the same?

Right, they are NOT the same!

Repeat from step **a.** with the other LARGE letter cards.

2. Find Letter Name/Letter Sound

Place 3 LARGE letter cards on the board for the class to see and 3 identical LARGE letter cards on the floor in red buckets directly under the letter cards on the board.

Give each child a bean bag.

a. Listen carefully to the sound that I make and put your beanbag on letter that makes the sound that I say.

b. Ready? /___/. Find the letter that makes the /___/ sound.

c. Great work! Let's put our bean bags in this bucket! This is the letter ___(point to the letter). It makes the /___/ sound.

d. Let's all try that sound together /___/.

e. What letter makes the /___/ sound?

f. Right! Let's all say ___together: ___.

g. Now I have another letter to find:

Repeat for the other 2 sounds and feel free to include the children in participation stressing the letter name and the sound it makes!

3. Letter Matching:

Match small letter cards to the larger letter cards inside/taped on the bucket.

a. This is the letter ___[target sound] and it makes a /___/ sound

(give each child a small letter card of each sound of the day)

b. Place the letter ___on the big card with the same letter ___.

- c. Take turns or make 2 lines and have 2 children go at a time to match that sound. Feel free to make it into a game and make it fun!
- d. Right! You placed the small ___card on the ___big card and it makes the ___sound. Let's say that sound together: .../___/
- e. Repeat for 3 sounds

Weeks 5 and 6 Example: Phoneme Identity: Listening for “b” and “s”

1. Animal Character:

Have the animal character associated with the letter B. Have a pile of cards with images and words under them.

- a. This is the letter B. It makes the /b/ sound. Help me make the /b/ sound. My friend “Bailey” is going to eat all the pictures that start with a /b/ sound.
- b. Place 2 cards in front of the children- bear and sun
- c. Let's say the words together
- d. Bring the children's attention to the print below the picture.
- d. “bear, sun”: which one starts with the /b/ sound? (Prompt as necessary through emphasizing the letter's sound as you pronounce the word or by placing the written word under the letter card).
- e. Great work! “bear” starts with the /b/ sound. Give “Bailey the” “bear” to eat.
- f. Gradually repeat interchanging words beginning with “b” and “s”

2. Mystery Bag:

Place picture cards with words starting with *one* of the *two* phonemes into a mystery bag. (“b” and “s”)

Place 2 LARGE sized letters on the floor.

- a. Have children take turns picking out of the mystery bag
- b. Child should identify the picture, the initial sound, and place the card beside the appropriate letter on the floor.
- c. “You found sun” Say “sun” Sun starts with the /s/ sound and this is the letter S. (Show the large letter S). Match the small card and the large letter cards.
- d. Have another child choose a picture out of the mystery bag.
- e. “You found a bat! Turtle starts with the /b/ sound. That is the letter “B” (Show large letter B). Repeat with all of the students taking turns.

3. Phoneme/Sound Categorization: Sorting

Children are required to sort cards by initial sounds. Have children listen for the initial sounds in words. They can stand up when they hear the sound or raise their hand to create an interactive environment.

- a. This is my friend “Billy”. Billy starts with a /b/ sound. Billy wants to find words that start with a /b/ sound.
- b. Watch my mouth as I say these words:
- i. Does “bug” start with a /b/ sound?

- ii. *“bug...hug” (slightly exaggerating the articulation of the initial sounds to show different tongue and lip positions)*
- iii. *No, they do not start with the same sound.*
- c. *What about bat? ... watch my mouth: “bat” . . . “bug” . . . Yes, they both start with a /b/ sound.*

Week 7 Example: Compound Word Blending

1. Introduce Blending Compound Words

Explain to the children that 2 single words can be “blended” or put together to make a new longer word. These longer words are called “compound words”. For example: words like “snow” and “man” can be put together to make a new word “snowman”.

**Use clapping/stomping/jumping to separate the words.*

- a. *This is the word “snow” (show the picture of the word “snow”) it is made up of some of the letters we have learned. Does anyone see any letters that they have seen before in this word? Nice work! “s” “n” “o” and “w” well today we are going to put 2 words together to make a bigger word*
- b. *Here is another word. It says “man” (Show the picture/word of “man”)*
- c. *When I put these words together, it says “snow-man”*
- d. *Let’s clap on each word- “snow”-”man”*
- e. *Continue with other words. See if the students can think of any “compound words”*
e.g. *Baseball, horseshoe, butterfly,*

2. Blending Compound Words Song

Sing the blending words song together. Use clapping/stomping/jumping to separate the words.

To the tune of “If You’re Happy and You Know It, Clap Your Hands”

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

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

If you think you know this word,

Then tell me what you’ve heard,

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

After singing, the teacher says the two words of a compound word separated by a pause. For example, “basket” . . . “ball” or words used in the previous activity.

3. Guess the Word Bingo

Have the students listen and put together two words to make a compound word. Give the children pre-made bingo boards with 9 pictures with words.

Show the students 1 picture card at a time and see if they can guess the word. Ex.

“dog” and “house” what does that word make?! Doghouse!

- a. *Today we are going to play bingo with our tokens. Listen carefully to the two words I say and put your token on the picture of the compound word those two words make.*

- b. Ready? “Dog” (pause) “house”. Put “dog” and “house” together and what word do we get?
- c. Right! “doghouse” put your token on “doghouse!”
- d. Continue with other compound words on the bingo board.

4. Find Your Puzzle Partner

- A. Give each child 1 half of the compound words
- B. Instruct the children to find their partner that matches the other half of their paper.
- C. Once they find their partner, have them sit cross-legged on the carpet quietly.
- D. Ask each student and his or her partner to say their picture they have and then put the words together to make their compound word.

Week 8 Example: Onset-Rime Blending

1. Introduce Onset-Rime Blending with Magician’s Writing

Introduce the activity by discussing magicians and magic tricks

Give children a magic wand and have a white board eraser for erasing the first sound.

- a. Do you guys know what a magician is?

A magician is a person who does magic tricks. This person can make stuff disappear with magic. Write a word (i.e. “bat”) on the board using large lower case letters

b. The teacher says “this word says bat. “John” can you show me the letter b that makes /b/ sound (or show the children the letter “b”. Now John, use your magic duster to wipe off the letter b.

c. Now I’m going to write a new letter- “h” Now we have h---at (segmenting the word at the onset-rime level and pointing to the letters as you say the sounds. What new word have we made? Wave your magicians wands and say altogether “hat”

d. Yes, the words says hat (pointing to the word)

e. Continue in this manner changing the onset each time and segmenting the word at the onset-rime level for the children to blend together to form the new word (e.g. change the first letter and separate the word into two parts and say them separately then blend them together to form the word) Continue with: cat, mat, fat, sat

f. Erase the entire word and then put the word fun on the board in lowercase letters The teacher says “this word says fun! Caroline can you show me the letter f that makes the /f/ sound (or show the children the letter f). Now Caroline, use your magic duster to wipe off the letter f. Now I’m going to write a new letter—s.

Now we have s—un (segmenting the word at the onset-rime level and pointing to the letters as you say the sounds). What new word have we made? Wave your magicians wands and say altogether “sun”

g. Continue in this manner changing the onset each time and segmenting the word at the onset-rime level for the children to blend together to form the new word

n. Continue with: run, bun

2. Find Your Puzzle Partner

A. Give each child 1 part of the word

B. Instruct the children to find their partner that matches the other half of their paper.

C. Once they find their partner, have them sit cross-legged on the carpet quietly.

D. Ask each student and his or her partner to say the sound or sounds on their picture card and put the sounds together to make their word.

Week 9 and 10 Example: Phoneme Blending

1. Introduce Sounds of Words: Elkonin Boxes

Using concrete objects to help focus children's attention on speech sounds. This tool can be used to help students think about the order of sounds in spoken words. Words should be chosen from familiar words and sounds.

Each time your mouth moves when you say a word, it makes a new sound! Today we are going to count how many sounds are in words!

1. Pronounce a target word slowly, emphasizing each sound.
2. Ask the students to repeat the word slowly with the teacher using her fingers to count the sounds as they are said. For example "sh" in sheep, hold up 1 finger. "ee" in sheep, hold up a second finger, and "p" hold up a third finger.
3. Okay students, how many sounds were in the word "sheep" that we just said.
4. Right! "3" I'm holding up 3 fingers because there are 3 sounds in the word "sheep"
5. Draw "boxes" on the dry erase board. Use one box for each phoneme or sound.
*Again, we want to emphasize that sounds are not the same as the number of letters. For example: "sheep" has 5 letters, but when we say the word, "sh-ee-p" it only has 3 sounds.
6. Ask the students to count the number of sounds in the word as you repeat saying the word slowly and tapping in box.
Repeat for each word.

2. Puppet Talk

Use speech target pictures and puppet to explain activities. Begin with placing two pictures (that start with different sounds) on the board and have the students guess what word you are saying when you say them slowly.

- a. Did you know that parrots can be taught to talk?
- b. Teacher says "Mr. Parrot (puppet) says words very slowly. See if you can guess which word he says (teacher pretends to be parrot)"
- c. P...ie s...u...n- clapping on each sound
- d. Teacher helps the children blend the words together and select the correct picture.

- i. Say the word together to help teach the parrot to talk
- e. “Now let’s teach Mr. Parrot how to read the words”
 - i. Encourage the children to show the parrot the word under each picture and to read the word slowly
 - i. Continue with target speech words in this manner with the therapist segmenting the word as the children guess which word the parrot is saying and then blending the words together to help teach the parrot to talk.
 - ii. CVC Word lists: bus, kick, jet, cat, fan, bed, dog, sun etc.
- f. Good job class! We blended together sounds to make words!

Appendix G

Weekly Teacher Log

Teacher's Log of Week One: Letter/Sound Knowledge (Please include comment and concerns)						
Goal/Skill:	Activity:	Time Spent	General Responses:	Teacher Assessment of Effectiveness (What worked well)	Other notes: (children who struggled)	Other Comments, Concerns, Changes to weekly plans/activities:
Week one: Letter Knowledge	<ul style="list-style-type: none"> • Letter & Sound Recognition • Letter/Sound Search Activity • Letter Matching Activity • Mystery Bag Activity • Letter-Sound Knowledge Bingo 					
Attendance:						