EFFECTS OF PHONOLOGICAL AWARENESS: CONTEXTUALIZED VERSUS DECONTEXTUALIZED TRAINING APPROACH

Lorri L. Street
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EFFECTS OF PHONOLOGICAL AWARENESS: CONTEXTUALIZED VERSUS DECONTEXTUALIZED TRAINING APPROACH

A Thesis

by

Lorri L. Street

Approved by:

__________________________, Committee Chair
Candace L. Goldsworthy, Ph.D.

__________________________, Second Reader
Laureen O’Hanlon, Ph.D.

__________________________
Date
Name of Student: Lorri L. Street

I certify that this student has met the requirements for format contained in the University format manual, and that this thesis is suitable for shelving in the Library and credit is to be awarded for the thesis.

Laureen O’Hanlon, Ph.D.  
Department of Speech Pathology and Audiology
Abstract

of

EFFECTS OF PHONOLOGICAL AWARENESS: CONTEXTUALIZED VERSUS DECONTEXTUALIZED TRAINING APPROACH

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Statement of the Problem

Research has suggested that approximately 25% of children do not make the connection between sounds (phonemes) and the letters that represent those sounds (graphemes) on their own. This disconnection, or lack of phonological sensitivity, makes learning to read and spell both arduous and frustrating for beginning readers.

The purpose of this study was to examine and compare the effects of two training programs on phonological awareness abilities in six children performing below grade level in their reading skills. The six participants participated in two individual, 1-hour, pre-and post-testing sessions, and then met in groups of three, twice weekly for 30 minutes for a total of 10 therapy sessions per group. The pre- and post- testing sessions included administration of the Phonological Awareness Skills Program – Test (PASP) (Rosner, 1999), the Clinical Evaluation of Language Fundamental (CELF-4) Subtest: Rapid Automated Naming (RAN) (Wiig, Secord, & Semel, 2003), the Expressive Vocabulary Test (EVT-2) (Williams, 2008), and the Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 2006).
Additionally, one month prior to the start of the PAT study the six participants’ phonemic awareness skills were measured using the standardized assessment *Dynamic Indicators of Early Literacy Skills (DIBELS)* (Good & Kaminski, 1996), administered by a school-based Intervention Specialist. During the remaining ten sessions, three participants received traditional phonological awareness training and three participants received modified RAVE-O, which includes, phonological awareness training. The traditional approach to phonological awareness training (PAT) employed skill building activities consistent with the hierarchy of phonological awareness (rhyming, segmenting, blending, on-set rimes) without an association to literature. The modified-RAVE-O approach differed in method with emphasis on building an inventory of easily retrievable components of language, through the introduction of phonological, semantic, and orthographic activities associated to a core curriculum reading book.

*Conclusions Reached*

The scores from both the modified-RAVE-O training group and the traditional phonological awareness training group indicated a departure from recent phonological awareness therapy trends of incorporating contextualized content into training. These results suggested that there are not significant differences in treatment outcomes between contextualized and decontextualized phonological awareness training.

____________________________, Committee Chair
Candace L. Goldsworthy, Ph.D.

____________________________
Date
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My sincerest thanks go to Ms. Chris Hoover, an extraordinary teacher without compromise, who helped in many ways by sharing with me her experience, wisdom, friendship, and most importantly, her students. Without her the commencement of my study would have been far more daunting.

Last, but in no way least, my heartfelt thanks and deepest appreciation goes to my much-loved husband, Jerry. Without his enduring commitment and steadfast encouragement—through a couple of meltdowns—my journey of returning to college and completing my Master’s program would not have come to fruition.
S tart small
T hink possibilities
R each beyond your known abilities
I nvest all you have in your dreams
V isualize miracles
E xpect to experience success

(author unknown)
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Chapter 1

REVIEW OF THE LITERATURE

Introduction

With little or no direct instruction, almost all young children develop the ability to understand spoken language. While most kindergarten children master the complexities of speech, they do not have the awareness that spoken language is made up of discrete words, which are made up of syllables, which themselves are made up of the smallest units of sound called “phonemes” (Sensenbaugh, 1994). The term phonological awareness refers to a general appreciation of the sounds of speech as distinct from their meaning. When that insight includes an understanding that words can be divided into a sequence of phonemes, this finer-grained sensitivity is termed phonemic awareness (Snow, Burns, & Griffin, 1998, p. 51). This innate phonemic awareness skill development – arrived at through a metalinguistic process called phonological awareness – is a skill most crucial to success in reading and spelling. Lonigan et al. (1998) described phonological awareness as sensitivity to the segmental nature of speech, an explicit understanding that spoken language comprises discrete units ranging from entire words and syllables to smaller units of onset-rimes, and phonemes. More simply stated, phonological awareness is the ability to notice, think about, and manipulate sounds. The intrinsic awareness that spoken language is made up of discrete sounds along with phonological access to lexical storage, is paramount to acquiring proficiency in literacy (Torgesen & Mathes, 2000). Wolf and Bowers (1999) maintained, “a major tenet of the
best developed theory of reading disabilities is that a core deficit in phonological processes impedes the acquisition of word recognition skills, which in turn, impedes the acquisition of fluent reading” (p. 1). Phonological awareness is not only correlated with learning to read, but is a foundational skill underlying the learning of spelling-sound correspondence (Stanovich, 1984). Once beginning readers have some awareness of phonemes and their corresponding graphic representations, research indicates that further reading instruction heightens awareness of language, assisting then in developing the later stages of phonemic awareness. Thus, phonemic awareness is both a prerequisite for and a consequence of learning to read (Yopp, 1992, p. 697). Unfortunately, children with phonological awareness deficits rarely catch up, but instead, fall increasingly behind in their reading development, which in turn affects all areas of academic learning.

This chapter will focus on research findings in the following areas: (a) students at-risk for reading disabilities, (b) differences between good and poor readers, (c) essential role that today’s school-based Speech and Language Pathologist plays in fostering literacy (d) assessment of phonological awareness skills, (e) phonological awareness training and its relationship to improved reading skills, (f) traditional (decontextualized) phonological awareness training approach with no association to literature, versus (g) contextualized phonological awareness training connected to literature.

Students at Risk for Reading Difficulty

The National Institute of Child Health and Human Development (NICHD) (2000b) reported that the failure of children to develop early phonological awareness
skills has become a national concern. Indisputably, adequate reading skills play a vital role in the future of children, both in their academic and work-related success. Many fluent adult readers, who believe they acquired the skill of reading with ease, may assume that learning to read is a natural process and a simple skill for children to learn (Rayner, Foorman, Perfetti, Pesetky, & Seidenberg, 2001). Reading, however, is not a natural act and many children experience great difficulty learning to do it. Reading disorders, in fact, are thought to be one of the most common forms of learning disabilities (Gittleman & Feingold, 1983). For at least 20-30% of American children, learning to read is an arduous task (Lyon, 1995). And, without help the problem worsens over the course of the child’s educational career (Goldsworthy, 2003). Multiple and complex factors contribute to poor reading outcomes in urban schools; for example, minority children and children who come from impoverished families (Snow et al., 1998). Reading deficits are disproportionally high among poor minority children, which may attribute to overrepresentation of minority groups in educational placement of special education (Shaywitz, Shaywitz, Fletcher, & Escobar, 1990). Males are also likely to be overrepresented due to their maladaptive behaviors, while their female counterparts are frequently underrepresented in teacher’s referrals of reading disabilities (Shaywitz et al., 1990). According the National Institute of Child Health and Human Development (NICHD) (2000a),

Approximately 10 million students experience problems learning to read; 10-15% of these drop out of high school; approximately 2% complete four-year college
In order to stem the escalation of reading problems impacting literacy, educators and specialists must early on identify significant contributing factors such as phonological awareness difficulties and provide solutions toward reducing this nationwide dilemma.

**Phonological Awareness: The Difference Between Good and Poor Readers**

A large body of research indicated that the primary problems for children’s poor performance in reading were deficits in phonological awareness (Morris et al., 1998). Persistence of phonological deficits and reading difficulty is the most common characteristic of children with learning disabilities. Phonological awareness seems a reliable predictor in early literacy to future reading success (Backus, 2005). Catts, Fey, Zhang, and Tomblin (2001) found that a kindergarten measure of phonological awareness was one of five factors to predict the label of “reading disabilities” in second grade. Although several other factors have been correlated with poor reading ability, Snyder and Downey (1997) also concluded that phonological deficits are the most prominent oral language deficits in children and adults with reading disabilities. In addition to the predictive feature of phonological awareness to reading success, some researchers insisted that phonological awareness and reading were in reciprocal relationship (Cataldo & Ellis, 1988; Wagner, Torgesen, & Rashotte, 1994). That is, phonological awareness
interacts with reading experience. Phonological awareness initially influences reading development, and the process of learning to read will, in turn, heighten the abilities in phonological awareness. Furthermore, when children try to read decodable text they often pronounce a new word by applying the alphabetic principle, which positively impacts this self-teaching process as well as enhance their vocabulary (Share, 1995). Reading instruction, that emphasizes decoding printed words highlights the sound structure of language and improves phonological awareness as well (Lundberg & Hoien, 1991).

There are a variety of traits that differentiate good from poor readers. For one thing, when good readers confront an unfamiliar printed word, they use many different strategies for word analysis, while poor readers simply try to sound out the word. If sounding out the word fails, poor readers have no alternative strategies. Good readers are able to rely on developmentally intact phonological processing abilities as mental operations that make use of the phonological or sound structure of oral language when learning how to decode written language (Torgesen, Wagner, & Rashotte, 1994, p. 276).

The importance of phonological awareness in developing reading skills has been proved by many researchers (Ball & Blachman, 1991; Bradley & Bryant, 1985; Lundberg, Frost, & Peterson, 1988). In the 1980s, British researchers Bradley and Bryant found that “a preschooler’s phonological aptitude predicts his reading three years later” (as cited in Macmillan, 1997, p. 55). In the 1990s, Shaywitz and other researchers found that “phonological difficulties were the most significant and consistent markers of dyslexia in childhood” (2003, p. 55). In recent years, researchers have made strides in understanding
the causal basis of reading disabilities (Torgesen et al., 1994; Wolf & Bowers, 1999).
One feature of children with reading disabilities or dyslexia was the discrepancy between
their reading performance and other cognitive abilities (Stanovich, 1988). Deficits in
phonological awareness and related phonological processing have been found to be
responsible for many children with reading disabilities although their other cognitive
abilities were above average (Catts, 1996; Wolf & Bowers, 1999). Difficulty in
connecting the printed letters (graphemes) with their represented sounds (phonemes) is
one detriment to fluent, effortless word recognition, and in turn negatively influences
reading comprehension, the ultimate goal of reading instruction (O’Shaughnessy &
Swanson, 2000).

Phonological awareness is not the only deficit identified in poor readers. Other
factors potentially predict or influence reading outcomes, such as, alphabet knowledge,
rapid naming abilities, verbal memory, auditory discrimination, working memory, and
grammatical ability (Catts, 1996; Stackhouse, Nathan, Goulandris, & Snowling, 1999).
Rapid naming and letter knowledge are additional factors responsible for poor reading
achievement (Treiman, Broderick, Tincoff, & Rodriguez, 1998; Wolf, Bowers, & Biddle,
2000). Although poor readers may exhibit some reading growth with the passage of time,
it is difficult for them to catch up to strong readers because their negative attitude towards
reading constitutes a barrier to reading fluency (Allington, 1994; Juel, 1988). In a
longitudinal study Catts and colleagues (2001) tracked reading achievement of 604 young
children and reported more than 70% of poor readers had a history of deficits in
phonological awareness or other areas of oral language in kindergarten. They found that even typically developing children may have one or two problems in phonological awareness skills when starting to learn to read; however, they may make sufficient progress to meet the standard criteria after instruction and practice. If the delays in phonological awareness skills are not addressed the deficits may last through life, which would prevent children from ever catching up with their peers, and increase the discrepancy in reading development between children with and without reading problems (Juel, 1988; MacDonald & Cornwall, 1995; Scarborough, 1998; Stuart & Masterson, 1992). Early phonological deficits may have long-term negative effects preventing young children from benefiting from the typical reading development trajectory. As a result, phonological deficits contribute to difficulties in other academic areas because classroom content is mainly delivered through written words. Juel (1988) studied the reading and writing development of 54 children with low socioeconomic background from first to fourth grade. The participants’ progress in phonological awareness, decoding, word recognition, spelling, comprehension, and writing were monitored by assessments each year. Juel found that children identified with poor phonological awareness at the end of first grade had a high probability to be poor readers at the end of fourth grade. The majority of fourth graders with poor reading performance in this study continued to experience difficulty in decoding monosyllabic nonsense words. In another a longitudinal study, McDonald and Cornwell (1995) assessed word recognition, phonological awareness, and reading comprehension in teenagers on whom data was collected since
they were kindergarteners. The researchers reported that the phonological awareness scores in kindergarten were highly related to the performance in phonological awareness 11 years later. They recognized the persistence of phonological deficits over a period of many years and also recognized phonological awareness as a long-term predictor to word identification and spelling skills when the participants reached 17 years old. The influence of phonological deficits could be described as “Matthew effect,” in which children with good phonological awareness skills at the beginning get richer (i.e., better) in later reading skill development, while those with poor phonological awareness skills get poorer (Stanovich, 1986).

*The School-Based Speech-Language Pathologists Role in Fostering Literacy*

Many children referred to speech-language pathologists during their preschool years attain their treatment goals, and are then dropped from the speech therapy caseloads. It is not uncommon however, to find many of these same children surfacing again in elementary school with significant problems in reading, spelling and writing (Goldsworthy, 1996). It is widely accepted that instruction in phonological awareness accelerates reading growth development. Numerous studies have demonstrated the effects of phonological awareness instruction on early reading success providing evidence that explicit training in phonological awareness skills positively influenced the gains on phonemic awareness, decoding, and spelling (Vellutino & Scanlon, 1987).
Speech Pathologist Sarah James (2008) stated:

The role of the school based Speech-Language Pathologist in literacy intervention, specifically phonological awareness training, is a practical fit to their existing knowledge linked to literacy evaluation and, therefore, to instruction. Speech-Language Pathologists do not need additional, extensive training, nor do they need to become reading teachers; they are fully equipped with on-hand knowledge of the five critical areas one needs to be a good reader: phonemic awareness, phonics, vocabulary, text comprehension, and fluency. (p. 2)

According to Goldsworthy (1998):

Children who are risk and children with known reading problems must have access to a team of specialists trained to work with oral language problems that evolve in later language problems. If that team is to succeed in correctly identifying children who are at risk for later reading problems, and if that team is to succeed in working with some of the oral language problems…then surely that team must include the speech-language pathologist as one of its key members. (p. vii)

Therefore, it is fundamentally sound and appropriate for the school based Speech-Language Pathologist to recognize, embrace and cultivate his/her role in supporting the literacy development in children.
The Assessment of Phonological Awareness Skills

The known correlation between difficulties with phonological awareness and later reading problems reinforces the value in assessing a child’s phonological and phonemic awareness skills (Hegde & Maul, 2006, p. 316). In today’s society, the failure to read proficiently has profound educational and life consequences — it is the most likely reason that children drop out of school, are retained, or are referred to special education (Parker, 1999). Numerous studies including correlation studies (Perfetti, 1987), longitudinal studies (Bradley & Bryant, 1983; Lundberg et al., 1988), and training studies (Ball & Blachman, 1991; Cunningham, 1990; Hatcher, Hulme, & Ellis, 1994) have reported that phonological awareness is a crucial predictor in early literacy development.

In order to understand which phonological awareness skills need to be trained the skills to target need to be assessed to determine where appropriate instruction begins. There are a number of phonological awareness skills, which can be measured by various tasks. Frequently used measurements of phonological awareness may include auditory discrimination, blending, counting, deletion, isolation, rhyme, segmentation, and substitution, sound categorization, tapping, and reversing order of sounds (Ball & Blachman, 1991; Lundberg et al., 1988; Yopp, 1988). Torgesen et al. (1994) divided the assessment in phonological awareness into two levels. The sensitivity to rhyme or alliteration was required at the beginning level, such as identifying which of three words begins or ends with the target word. The advanced level involved explicit manipulation or separation of the individual sounds, such as pronouncing the initial sound of a word, or
pronouncing a word with deletion of a specific phoneme. Adams (1990) based her phonological awareness measures on five tasks: phonemic segmentation tasks, phonemic manipulation tasks, syllable-splitting tasks, blending tasks, and oddity tasks (e.g., recognize which word was different from others based on the first, middle, or last sound). Wang (1999) categorized phonological awareness tasks in alphabetical system as syllable, onset-rime, and phoneme levels.

Torgesen and Mathes (2002) grouped all “phonemic” awareness measures into three broad categories: sound comparison, phoneme segmentation, and phoneme blending. They did not include measures of sensitivity to rhyme or syllables because the larger units in a word seemed less predictive of reading disabilities than individual phonemes. Sound comparison sometimes called “phoneme identity” involves a variety of formats, and requires children to discriminate between the sounds in different words. This test is appropriate to use on kindergarten-age children because it focuses on basic level without asking children to pronounce or manipulate the individual phonemes. For example, children are required to choose a word that begins or ends with the same phoneme of the target word (e.g., “dog, cup; which has the same first sound as the word ‘cat’?”). In the 1990s the term “synthesis task” was sometimes used to indicate sound blending (Torgesen & Bryant, 1994). In sound blending, children are orally presented onsets and rimes, or a sequence of separate phonemes and are required to blend them together to create a word. For example, tasks in onset-rime blending require children to
blend onsets and rimes and to form words (e.g., “what word do these sounds make?” /d/ and /og/).

Phoneme blending skills are measured by asking children to blend three to four phonemes into words (e.g., “what word do these sounds make?” /m/o/p/). Sound segmentation skills, sometimes called “analysis” tasks, are the most frequently used when measuring phonological awareness. Sound segmentation tasks require a relatively explicit level of phoneme awareness and are viewed as high-level ability in the phonological awareness hierarchy. This involves requiring children to break words into smaller sound units and say the sounds in a left-to-right order. Some children may not successfully segment at the phoneme level, but are able to segment words at onsets-rime level. Segmentation at the phoneme level is commonly used in assessments, including segmenting the initial, middle, or last phoneme of a word (e.g., “what sound does ‘hit’ start with?”), or segmenting a one-syllable word into three to four phonemes (e.g., “what sounds do you hear when I say ‘man’?”) (Torgesen & Mathes, 2002). Phoneme counting (tapping), defined as identifying the number of phonemes contained in a target word, is a variation of sound segmentation (Bruck, 1992). Wang (1999) divided phonological awareness into various categories:
(a) Phoneme segmentation, including the first sound identification (e.g., “what sound does ‘tap’ begin with?”), or segmenting a word into individual phonemes (e.g., “what is the first sound you hear in ‘tap’?”).
(b) Phoneme blending to form words (e.g., “what word do these sounds make?” /t/a/p/).
(c) Phoneme deletion, including saying the word while deleting one phoneme (e.g., “if the /s/ is taken away from ‘Sam’, what word is left?”).
(d) Phoneme substitution, including replacing one phoneme with another (e.g., “instead of saying the first sound in ‘tap’ say the /s/ sound instead, and tell me the new word.”)
(e) Phoneme discrimination (oddity task), including choosing a word with different first, last, or middle sound from other words (e.g., “which word from ‘tap’, ‘tall’, ‘dog’, ‘tom’ has a different first sound from the others?”) Additionally, some variations exist, such as phoneme reversal (Mercer & Mercer, 2005). For older children, tasks measuring manipulating phonemes such as phoneme counting, phoneme deletion, phonemes switching, or initial sound categorizing are used.

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is a measurement tool frequently used in schools to assess pre-reading and reading skills. Good and Kaminski (1996) developed the test to provide continuous assessment of students’ fluency with fundamental literacy skills, and to predict future reading skills. Based on a prevention-oriented model, DIBELS measures all skills regarded as “Big Ideas of Early Literacy”: phonological awareness, alphabetic principle, fluency with connected text, vocabulary, and comprehension. The subtests within the DIBELS, all of which have been empirically validated, are comprised of seven subtests: Letter-Naming Fluency (LNF), Initial Sound Fluency (INF), Phoneme Segmentation Fluency (PSF), Nonsense Word Fluency (NWF), Oral Reading Fluency (ORF), Retell Fluency (RTF),
and Word Use Fluency (WUF). Two of the subtests in DIBELS specifically relate to phonological awareness skill assessment. PSF subtest assesses whether a child is able to verbally produce the individual sounds in the correct sequence when a spoken word with 3-4 phonemes is presented. The NWF subtest assesses if a child can apply letter-sound correspondence to read words. Nonsense words (e.g., *num, kic, feg*) are used to prevent students from correctly responding due to the familiarity of the words tested. Because DIBELS is easy to administer with time-efficient procedures, it allows for a student’s level to be quickly determined. These measures are instructionally relevant and in accordance with the focus of early reading intervention, and further help to direct the focus for additional reading support.

*Phonological Awareness Training: A Relationship to Improve Reading Skills*

Instruction in phonological awareness is important for most children and critical for others. Children with language-based reading disabilities typically have underlying problems in their fundamental phonological code (Catts, 1996). Success in early reading depends a great deal on achieving a certain level of phonological awareness competency.

The effectiveness of phonological awareness instruction on reading development has been corroborated by existing studies. Wagner and Torgesen (1987) reported that early performance on phonological awareness tasks in kindergarten or first grade is a powerful predictor of later reading achievement. In order to read, a child first must understand that a word is composed of smaller units, and further have the ability to break
up words into sounds. Only then are they ready to learn letter-sound relationship and begin to sound out unfamiliar words.

Specifically, phonological segmentation skills have been identified as the most reliable predictor to apply alphabetic principle to pseudo-word decoding, which in turn is necessary for new words learning and reading (Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, & Shanahan, 2001; Yopp, 1988). Consequently, students with poor reading skills early on in life are likely to continue having poor reading skills in the future. According to Lance, Swanson, and Peterson (1997), phonological awareness “is not one dimensional, but instead considered to be a constellation of cognitive abilities that are related to a child’s understanding of the segmental nature of English” (p. 1002). Given this complexity, it is essential for students to develop an understanding of how letters map onto sounds (phonemes) to create sound-symbol correspondences and spelling patterns. The knowledge of the relationship between letters and sounds, that is, the alphabetic principle, is the hallmark of successful readers (Adams, 1990). Goldsworthy (2003) described the results of this cognitive progression,

As phonemes begin to emerge as definite forms, the child becomes aware of them as structures in and of themselves. Becoming aware of these structures is critical for the language learner to develop strong, efficient phonological representations. The child comes to appreciate that phonemes can be “played with” as if they were mental toys. Words can be broken into parts; syllables within syllable can be added, deleted, and/or moved around in words. Becoming aware of phonemes as
structures provides a solid foundation onto which the learner can build, that is, the learner can add another layer of language, namely a visual representation...the phonological code forms foundation onto which the graphemes system will be laid (pp. 1-2).

**Traditional (Decontextualized) Approach to Phonological Awareness Training**

Phonological awareness training in the traditional sense is a decontextualized approach with an emphasis on instructional content that is linear in strategy and typically void of connection to literature. Adams (1990) divided a child’s phonological awareness into five hierarchical categories: (a) knowing words are composed of sounds, and being able to remember 28 familiar rhymes; (b) being sensitive to sounds and able to recognize rhyme and alliteration in words; (c) being able to blend and segment words at syllable level; (d) being able to segment words at phoneme level; and (e) the ability to manipulate phonemes by adding, deleting, or altering phonemes to form a new word. Grossen and Carnine (1993) identified several essential components of a successful phonological awareness training program to facilitate children’s reading abilities. These components included: letter-sound correspondences taught explicitly and systematically beginning at the most frequently used letter sounds; phoneme blending taught for later word reading; corrective feedback delivered orally and immediately; and fourth, extensive practice provided, such as applying the learned letter-sound correspondence to real words. Snow and colleagues (1998) identified what they considered to be critical elements of effective early reading intervention as: teaching the alphabetic principle, promoting phonological
awareness, and integrating these components with activities to develop comprehension and fluency skills. Additionally, concrete representation of sound is suggested by researchers, involving the use of objects, such as, blocks, picture cards, plastic letters, and magnetic letters to represent a sound. After reviewing evidence-based research, Foorman and Torgesen (2001) found the effectiveness of a training program would be maximized on at-risk children if the instruction was delivered more explicitly and comprehensively, more intensely, and supportively in small-group or one-on-one formats. Poskiparta, Niemi and Vauras (1999) studied the effects of linguistic awareness practice on at-risk 1st grade readers who were identified on the basis of their poor phonological awareness skills. The core of their research specifically focused on improving the skills of phoneme blending, word recognition, spelling, and listening comprehension. At the end of the study the results showed the intervention group demonstrated more growth in their phonological awareness development then the non-intervention group.

The intervention approach of van Kleeck, Gillam, and McFadden (1998) was built around a broad array of phonological skills. The study was conducted on sixteen preschool children with developmental speech and language disorders. The participants received instruction in rhyming, phoneme judgment and correction, initial sound identification, generation of initial sounds, and identification of initial and final sound combinations. Results showed the instruction was most helpful for children with little or no phonological awareness skills before training, and that phonological awareness training in classroom contexts appeared to be successful with preschool children with a
wide range of speech and language abilities. Lundberg, Olofsson, and Wall (1980) examined the effects of phonological awareness training on reading and spelling. The participants were kindergarten children being divided into two groups. The experimental group received 20-25 minutes training per day focusing on rhyme production, word segmentation, syllable segmentation and synthesis (blending), deletion of initial phonemes and segmentation and synthesis (blending) of phonemes, while the control group did not receive any instruction. After entering the first grade for seven months, the experimental group outperformed the control group on measures in speed and accuracy of silent word decoding with only trend level (<.10) significance. The experimental group significantly outperformed the control group on a measure of dictated spelling and fluency assessments, and the effects were maintained until second grade. The outcome of this study demonstrated the causal relationship between metalinguistic competence (phonological awareness), and reading and spelling skills. Treiman and Zukowski (1991) found that dividing words into onsets and rimes were the first phonological skills children developed. They further discovered that children developed segmentation skills at the phoneme level at the onset of learning to read. These findings implied that the development of phonological awareness may also be reciprocal with reading instruction in an alphabetic system.

The bi-directional relationship between phonological awareness and literacy growth was apparent in a multitude of studies reviewed. The implication consistently revealed is that explicit instruction in phonological awareness both prior to and during
reading instruction is critical. However, that said, the sequence and rate of phonological awareness levels vary across learners, and many skills overlap during development (Lane, Pullen, Eisele, & Jourdan, 2002). In spite of all the numerous practices of traditional phonological awareness training, other approaches to improving literacy continue to be studied and put into practice. The need to further explore and gather knowledge about non-traditional phonological awareness intervention methods is essential in broadening further opportunities for the prevention of reading failure.

**Modified-RAVE-O: A (Contextualized) Approach to Phonological Awareness Training**

An outgrowth of the increased awareness of the importance of phonological awareness to reading competency was new research conducted to determine ‘best practice’ for approaching intervention. As an alternative to the traditional decontextualized phonological awareness training approach, Wolf, Miller, and Donnelly (2000) reported on a new intervention program called Retrieval, Automaticity, Vocabulary Elaboration, and Orthography (RAVE-O). RAVE-O was developed by and evaluated at Tufts University, Center for Reading and Language Research by Wolf, Morris, and Lovett (1999) as a comprehensive, fluency-based reading intervention program that combines the best knowledge about phonological processes, decoding principles, and vocabulary development with new knowledge about lexical retrieval and automaticity for the sub-processes of reading.

The RAVE-O program is known to work systematically and simultaneously not only at the word level, but also on multiple linguistic components at the connected
text level with the major goal to teach struggling readers explicitly in multiple ways, and over many different exposures, what we want their brains to do on their own (Wolf et al., 2000, ¶ 2).

Meaningful, literacy-based (contextualized) phonological awareness training can be a significant resource for the continuum of oral to written language intervention. Goldsworthy (1998) maintained that there is an advantage of using vocabulary from stories that children are already familiar with either from reading in their homes or classroom curriculum. Vocabulary from a favorite story is more likely to be salient to children allowing for more easily recognized words. The familiar words are then used in word games, as the words themselves hold relevant interest to the children, engaging their attention and enjoyment.

School-based Speech-Language Pathologists seldom, if ever, have the customary preparation time allotted to classroom teachers. Having large caseloads that dictate time constraints, student contact rarely reaches the levels necessary for implementing the full scope of the RAVE-O training program. Recently, a morphing of sort, of the original RAVE-O program into an adaptation recognized as “modified-RAVE-O” made an entrance (Goldsworthy, 2008). The more streamlined and less time intensive m-RAVE-O approach to phonological awareness training is easily compatible with literature relevant to curriculum. Much like the original RAVE-O program, m-RAVE-O is also an explicitly trained literature based phonological awareness intervention method that introduces an integrated and layered sequence of steps in four phases of training. Both approaches share
the common goal of teaching children to achieve accuracy and automaticity in the retrieval of multiple components related to words that include letter and letter-pattern knowledge, multiple meanings, grammar, and morphological endings. m-RAVE-O works systematically and simultaneously at the word level, text level, and with multiple linguistic components by teaching reading explicitly and in multiple ways. The four phases of m-RAVE-O consist of, Phase I: includes a series of phonological awareness skill building activities integrating the hierarchy of phonological awareness. Phase II: includes an introduction of core words from the curricula or children’s reading book and begin the orthographic representation. This phase includes: asking participants to produce the sounds that letters make, create on-set rimes (word families) first separated with dashes and then without dashes, and to generalize the on-set rimes into bigger words. Participants are then asked to create multiple meanings from the core words and write the on-set rimes and multiple meanings in a journal. Additionally, Phase II includes the review of any previous week’s definitions and multiple meaning using word sorts. Phase III: continues with all the steps described in Phase II, but adds word webs and Wh-questions for one or more meaning to each core word. Phase III continues to cultivate the orthographic component introduced in Phase II, by having the participants write words from the word webs into the journal and reviewing the previous week’s definitions. The final step, Phase IV: completes the phases by cycling through all the steps described in Phases II and III, plus the review of the previous week’s core word definitions and completion of writing exercise worksheets. Together, this combination of seamless
layering of relevant ‘words ‘connection facilitates the association between the oral to
written continuum of language linked to literature.

Statement of the Problem

Phonological awareness cannot be disputed as playing a crucial role in reading
and overall academic achievement. Reducing the number of children with reading
difficulties must continue as a committed focus for the school-based Speech-Language
Pathologist. The development and delivery of innovated phonological awareness training
methods that go beyond the traditional approaches of intervention should be both
embraced and practiced in an all out effort for Educators and Specialists to reduce further
proliferation of literacy problems.

This current research was designed to answer the following question: In a school-
based speech-language therapy setting is there significant differences in treatment
outcomes between contextualized phonological awareness training versus a
decontextualized intervention approach?
Chapter 2

METHODOLOGY

Design

This study was conducted over a period of eight weeks, six weeks of therapy sessions and one week each for pre- and post-testing. Two groups of three participants each identified with reading difficulties were selected to participate in twelve, 30-minute group therapy sessions. Each participant’s phonological awareness skills, rapid automated naming abilities, receptive and expressive vocabulary skills, and reading fluency were pre-tested prior to commencement of the first therapy session. In the following six weeks three participants were enrolled in a traditional (decontextualized) phonological awareness training program, while the other three participants were enrolled in the m-RAVE-O (contextualized) phonological awareness training program. The skills mentioned above were then post-tested during the eighth week of the study.

Participant Selection and Methods for Obtaining Data: Pre-Testing

The six participants, two boys and four girls ranging in age from seven years, four months to seven years, nine months, were selected from a second grade class at Taylor Street Elementary School, in the Robla School District. Each student was an English-only speaker, and had no prior history of vision or hearing problems. The six participants were narrowed from a group of 16 2nd graders who were enrolled in a lower academic level class. The parents of all six participants reported their child experiencing academic difficulties, mostly related to problems with reading. In the month prior to the
commencement of this study each participant was given a progress monitoring assessment for oral reading fluency as part of an on-going 2nd grade reading measurement.

The *Dynamic Indicators of Basic Early Literacy Skills (DIBELS)*, subtest *Oral Reading Fluency (ORF)* (Good & Kaminski, 1996), was used as a standardized, individually administered test that measured the participants fluency in 2nd grade-level connected text. The ORF was designed to (a) identify children who may need additional instructional support, and (b) monitor progress toward instructional goals. The passages are calibrated for the goal level of reading for each grade level. Student performance is measured by having students read a passage aloud for one minute. Words omitted, substituted, and hesitations of more than three seconds are scored as errors. Words self-corrected within three seconds are scored as accurate. The number of correct words per minute from the passage is the oral reading fluency score. Additional language assessments were conducted at the onset of the first week of the study. Those tests included: The *Phonological Awareness Skills Program (PASP)* test (Rosner, 1999), *Peabody Picture Vocabulary Test – 4th Edition (PPVT)* (Dunn & Dunn, 2006), *Expressive Vocabulary Test – 2nd Edition (EVT)* (Williams, 2008), and the subtest *Rapid Automatic Naming (RAN)* from the *Clinical Evaluation of Language Fundamentals (CELF-4)* test (Semel et al., 2003).

The PASP test assessed each participant’s skills in phonological awareness development. The test was designed to involve an active, synthesis-via-analysis process
requiring the examinee to “do something” to information being presented. This included taking words apart (analyzing), then putting words back together (synthesizing). The results of this process revealed each participant’s understanding of how words are organized, and provided measurement of any phonological awareness deficits (Rosner, 1993).

The Rapid Automated Naming subtest from the CELF-4 is a good predictor for students at-risk for not acquiring beginning reading skills. The test evaluated each of the participant’s ability to (a) visually process and store repeated visual stimuli (colors, shapes, and color-shape combinations) in working memory and (b) naming the visual stimuli automatically, accurately, fluently, and quickly in a timed, rapid and automatic naming task. These skills directly relate to preschool and elementary school requirements for processing pictured or printed visual stimuli such as objects, numbers, and letters.

The PPVT–4 assessed each participant’s receptive (hearing) vocabulary. Since vocabulary is strongly related to reading comprehension ability, a person must know the meaning of the words he or she is reading in order to understand the text (Dunn & Dunn, 2006). Vocabulary knowledge may also contribute to reading success in other, less obvious ways, such as, supporting young children to be better able to analyze the representation of sounds in words (Metsala, 1999).

The EVT-2 assessed the participants’ expressive vocabulary and word retrieval. Specifically, it measured expressive vocabulary knowledge with two types of items, labeling and synonym (Williams, 2008).
Results of the language skills and oral reading fluency pre-therapy testing of all six participants’ revealed evidence of deficits in several areas of oral language skills. The *Oral Reading Fluency* subtest from *DIBELS* revealed five of the participants were below the January, 2009, targeted goal of 70 WPM. One exception was a participant whose January, 2009 oral reading fluency measurement met the targeted goal of 70 WPM. On the *PASP* pre-therapy assessment, of the six participants, three scored lower than age-equivalency, one scored at age-equivalency, and two scored higher than age-equivalency. Of interest to note is two of the participants who scored higher than age-equivalency on the *PASP*, one had reached the *DIBELS* January, 2009, targeted goal of 70 WPM, while the other remained below the targeted goal, attaining only 27 WPM. On the *RAN* subtest from the *CELF-4*, the Color-Shape Time Criterion, of the six participants, three participants scored in the ‘Normal’ range, one scored in the ‘Slower Than Normal’ range, and two scored in the “Non-Normal” range. In the Color-Shape Error Criterion, all six participants scored in the “Normal” range. For the *PPVT-4* pre-therapy assessment, four participants scored in the “Low Average” range, all with Standard Scores in the low 90s. The other two participants fell in the “Moderately Low Average,” with Standard Scores in the low 80s. The *EVT-2* test was administered as the final pre-therapy assessment, and of the six participants tested, two scored “Average,” three scored in the “Moderately Low Score” range, and one scored in the “Low Average” range.
Participants

Written permission for each participant to participate in this study was obtained from parents and the participants themselves (see Appendices A and B). Through a randomized selection procedure, each participant was assigned to either Group A, the “Modified RAVE-O Training group,” or Group B, the “Traditional Phonological Awareness Training” group. The resulting two groups of three participants each were well matched in terms of age, gender, academic levels and reading fluency scores. The group receiving Modified-RAVE-O training had lower mean pre-therapy standard scores on the PPVT-4, EVT-2, and the subtest RAN from the CELF-4, than the Traditional Phonological Awareness Training group, however, the results of the pre-therapy mean standard scores for both groups on the PPVT-4, EVT-2, and the PASP, were very close in result outcomes.

Modified RAVE-O participants. Participant 1, a female aged 7 years, 10 months. Her speech was observed as normal in rate and prosody, and she correctly articulated all speech sounds in conversation. She was enrolled in the lowest level of 3, 2nd grade classes because of low academic achievement. Additionally, she had a history of high absenteeism along with some mild behavioral problems. Neither of these problems affected the pre-testing, but very likely contributed to the lower post-testing scores.

Participant 2, a female aged seven years, four months. Her speech was observed as normal in rate and prosody, and she correctly articulated all speech sounds in
conversation. She too was enrolled in the lowest level of 3, 2\textsuperscript{nd} grade classes due to low academic achievement.

Participant 3, a male, aged seven years, six months. His rate a speech was observed as mildly fast in rate, but with normal prosody. He correctly articulated all speech sounds in conversation. He was enrolled in the lowest level of 3, 2\textsuperscript{nd} grade class due to low academic achievement.

*Traditional phonological awareness training participants.* Participant 1, a female, aged seven years, six months. Her speech was observed as normal in rate and prosody, and she correctly articulated all speech sounds in conversation. She was enrolled in the lowest level of 3, 2\textsuperscript{nd} grade class due to low academic achievement.

Participant 2, a female, aged seven years, four months. Her speech was observed as normal in rate and prosody. She correctly articulated all speech sounds in conversation. She was enrolled in the lowest level of 3, 2\textsuperscript{nd} grade class due to low academic achievement.

Participant 3, a male, aged seven years, nine months. His speech was observed as fairly fast in rate, but with normal prosody, but correctly articulated all speech sounds in conversation. He was enrolled in the lowest level of 3, 2\textsuperscript{nd} grade class due to low academic achievement.

*Procedures for Obtaining Data: Post Testing*

For purposes of comparing phonological awareness, expressive and receptive vocabulary, rapid automatic naming, and oral reading fluency progress, post-therapy
assessment data was obtained from all six participants through re-administration of the pre-therapy tests; The Phonological Awareness Skills Program (PASP) test, Peabody Picture Vocabulary Test – 4th Edition (PPVT), Expressive Vocabulary Test – 2nd Edition (EVT), and the subtest Rapid Automatic Naming (RAN) from the Clinical Evaluation of Language Fundamentals (CELF-4) test.

All six participants evidenced an increase in their oral reading fluency skills measured by the ORF subtest of DIBELS, progress monitoring conducted in March, 2009. All three participants in the Modified RAVE-O group evidenced an improvement in their oral reading fluency skills between January and March, 2009. The post-therapy mean increase for this group was 11.33 WPM. The Traditional Phonological Awareness Training group participants also demonstrated improvement in their oral reading fluency skills with a higher post-therapy mean increase of 16.67 WPM.

Therapy Approaches

Modified RAVE-O Therapy

Once initial testing was completed during week one, three of the participants were introduced to a method of therapy modeled after a comprehensive, fluency-based reading intervention program called Retrieval, Automaticity, Vocabulary, Elaboration, Orthography (RAVE-O) (Wolf & Miller, 1997; Wolf et al., 2000). The Modified RAVE-O (m-RAVE-O) program is a more streamlined and less time intensive adaptation of the RAVE-O program, but keeps intact the foundational premise of integrating phonological, orthographic, and semantic knowledge. m-RAVE-O is easily compatible with literature
relevant to curriculum allowing for an explicitly trained literature based phonological awareness intervention method integrating a layered sequence of four phases of training. Both the RAVE-O and m-RAVE-O methods share the common goal of teaching children to achieve accuracy and automaticity in the retrieval of multiple components related to words. This includes letter and letter-pattern knowledge, multiple word meanings, grammar, and morphological endings taught systematically and simultaneously at the word and text level, and incorporates several linguistic components teaching reading explicitly in multiple ways.

Beginning with week 1 of therapy the three participants of the m-RAVE-O group were introduced to Phase 1 of the program. This comprised a series of hierarchal phonological awareness skill building activities that included: activities at the word level; counting words, identifying missing words from a list, and identifying a missing word in a phrase or sentence. Activities at the syllable level included syllable counting, syllable deleting, syllable adding, syllable reversing, and syllable substituting. Activities at the phoneme level included initial sound matching, blending onset-rimes in monosyllabic words beginning with blends and single consonant, rhyme recognition, sound categorization, matching initial and final sound-to-word, supplying initial and final sounds in words, segmenting initial and final sounds in words, deleting initial and final sounds in words, substituting initial and final sounds in words, segmenting the middle sound in monosyllabic words, and deleting sounds within words. Additionally, during the first week, a pre-selected, and salient, language arts curriculum story was read to the
participants twice. Starting with week 2 of therapy, and continuing through the 4th week, Phase II reviewed blending and segmenting individual phonemes, introduced five core words from the selected curriculum story, and integrated orthographic representation by having the participants write the core words into a journal. Phase II also included having the participants produce sounds of letters, create onset-rimes – first separated with dashes and then without dashes – and generalize the onset rimes into bigger words. Participants were asked to create multiple meanings from core words and write the onset-rimes and multiple meanings in a journal. Additionally, Phase II included the review of the previous week’s definitions and multiple meaning through the use of word sorts. The 5th week of therapy moved into Phase III by continuing with the steps described in Phase II, but adding word webs and Wh-questions for one or more meaning to each core word. Phase III carried on the cultivation of the orthographic component introduced in Phase II, by having the participants write words from the word webs into their journals and reviewing the previous week’s definitions. Lastly, weeks 6 and 7 culminated in the Phase IV. This phase completed the program by cycling through all the steps described in Phases II and III, in addition to reviewing the previous weeks core word definitions, and completing writing exercise worksheets such as filling in sentence blanks using the core words. Together, this combination of a seamless layering of relevant “word connection” facilitated the association between oral to written continuum of language while linked to curriculum literature.
Traditional Phonological Awareness Training

Phonological awareness intervention typically has followed a traditional approach where a speech pathologist introduces a hierarchical series of discrete, linear phonological awareness activities, none of which integrate literature or an orthographic component. Because phonological awareness skills seem to develop along a continuum from rhyme to segmenting, the hierarchy of activities also move in a continuum of less complex tasks (rhyming) to more complex tasks (blending and segmenting individual phonemes). Once pre-therapy assessment was completed, the three participants of the Traditional Phonological Awareness Training group were introduced to the hierarchy of phonological awareness skill building activities. Week 1, began with a variety of rhyming tasks including: listening and discriminating rhyming words, rhyme matching, identifying two out of three printed rhyming words, and producing rhyming words when given a stimulus word.

During the 2nd week of training sentence segmentation was introduced with discrete skill building activities that included: breaking sentences into individual words by means of clapping out the words in the given stimulus sentence. Once the participants had mastered the listening/discrimination task, week 3 of the training provided the participants with colored cubes and instruction to listen to stimulus sentences and put together the cubes to reflect the number of words heard in a sentence. During week 4, CLOZE activities were incorporated where the participants had to identify a missing word in phrases and sentences. In the 5th week of training, syllable segmentation and
blending was introduced. The activities for syllable segmentation included having the participants listen to and discriminate words into syllables by clapping out the syllables in words along with the clinician. The first names of the participants were introduced initially to provide a link of familiarity to the word/syllable relationship. Once the participants had mastered the listening/discrimination task, they were again provided colored cubes and instructed to listen to the stimulus word and put together the cubes representing the number of syllables heard in a word. The syllable blending activities had the participants listen to stimulus syllables provided by the clinician and put them together to identify the word. For example: *Ti-ger* – (Say and clap “*ti-ger*”). The participants were also asked to identify how many syllables they heard in a word. For example: “How many parts?” (two). “*Tiger*” has two syllables (ti-ger). Syllable deleting, adding, reversing and substituting were other activities included in the syllable segmentation and blending tasks.

From here the training continued with the introduction of onset-rimes, the next more complex level of the phonological awareness continuum. Onset-rime familiarized the participants with the idea of word families, and helped develop their concept of “rime” versus “rhyme.” The group was taught that “rhyme” referred to the same sounds in words such as ‘dog/fog’, whereas “rime” referred to whatever sounds are left in a word after the initial consonant(s) is/are removed, such as, ‘c/at’ and ‘st/op’. During week 6, the last week of training the final and highest level of the phonological awareness hierarchy, blending and segmenting individual phonemes, was introduced. The blending
phoneme activities included listening to a sequence of individual sounds and combining them to produce a word. For example, blending together the sounds “/b/a/d/” to produce the word “bad.” Other activities at the phoneme level included initial and final sound matching, supplying initial and final sounds to word parts, deleting initial and final sounds in words, substituting initial and final sounds in words, and deleting sounds within words. These individual skill sets were re-introduced to the participants through cycling a variety of clinician-devised activities at the beginning of each subsequent therapy session.
Chapter 3

RESULTS

Group Characteristics: Dynamic Indicators of Basic Early Literacy Skills

Tables 1 and 2 summarize both groups’ mean pre- and post-therapy performance levels on the subtest Oral Reading Fluency of the *Dynamic Indicators of Basic Early Literacy Skills (DIBELS)* (Good & Kaminski, 1996). Mean pre-therapy scores, post-therapy scores, the differences between them, and the associated standard deviations (SD) are listed for the two groups: Modified RAVE-O and Traditional Phonological Awareness Training.

Table 1

*Modified RAVE-O Group. DIBELS. Mean Levels of Performance*

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluency</td>
<td>58.67</td>
<td>12.06</td>
<td>70.00</td>
<td>19.70</td>
<td>+11.33</td>
</tr>
</tbody>
</table>
Table 2

*Traditional Phonological Awareness Training Group. DIBELS. Mean Levels of Performance*

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluency (WPM)</td>
<td>42.33</td>
<td>15.50</td>
<td>59.00</td>
<td>13.11</td>
<td>+16.67</td>
</tr>
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</table>
Group Comparisons: Dynamic Indicators of Basic Early Literacy Skills

Figure 1 illustrates each group’s pre- and post-therapy scores on the Oral Reading Fluency subtest. Tables 1 and 2 delineate the mean change in these scores.

Figure 1. Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (Good & Kaminski, 1996), mean level of performance comparison scores.

Tables 3 and 4 summarize both groups’ mean pre- and post-therapy performance levels on the Peabody Picture Vocabulary Test – 4th Edition (PPVT-4) (Dunn & Dunn, 2006). Mean pre-therapy scores, post-therapy scores, the differences between them, and the associated standard deviations (SD) are listed by standard scores for the two groups: Modified RAVE-O and Traditional Phonological Awareness Training.

Table 3

*Modified RAVE-O Training Group. PPVT-4. Mean Levels of Performance*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
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<td>PPVT-4</td>
<td>90</td>
<td>3.6</td>
<td>90.33</td>
<td>4.04</td>
<td>+0.33</td>
</tr>
</tbody>
</table>

Table 4

*Traditional Phonological Awareness Training Group. PPVT-4 Mean Levels of Performance*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPVT-4</td>
<td>91.67</td>
<td>.49</td>
<td>95.33</td>
<td>4.16</td>
<td>+16.67</td>
</tr>
</tbody>
</table>
Group Comparisons: Peabody Picture Vocabulary Test – 4th Edition

Figure 2 illustrates each group’s pre- and post-therapy scores on the *Peabody Picture Vocabulary Test – 4th Edition*. Tables 3 and 4 delineate the mean change in these scores. Figure 2 measured the understanding of the spoken word in standard American English, mean level of performance comparison scores.

*Figure 2. Peabody Picture Vocabulary Test – 4th Edition (PPVT-4) (Dunn & Dunn, 2006).*
Group Characteristics: Expressive Vocabulary Test – 2nd Edition

Tables 5 and 6 summarize both groups’ mean pre- and post-therapy performance levels on the *Expressive Vocabulary Test, Second Edition (EVT-2)* (Williams, 2008). Mean pre-therapy scores, post-therapy scores, the differences between them, and the associated standard deviations (SD) are listed by standard scores for the two groups: Modified RAVE-O and Traditional Phonological Awareness Training.

Table 5

*Modified RAVE-O Training Group. EVT-2. Mean Levels of Performance*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVT-2</td>
<td>86.00</td>
<td>12.16</td>
<td>92.67</td>
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<td>+6.67</td>
</tr>
</tbody>
</table>

Table 6

*Traditional Phonological Awareness Training Group. EVT-2. Mean Levels of Performance*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVT-2</td>
<td>88.00</td>
<td>9.16</td>
<td>93.67</td>
<td>4.04</td>
<td>+5.67</td>
</tr>
</tbody>
</table>
Group Comparisons: Expressive Vocabulary Test – 2nd Edition

Figure 3 illustrates each groups pre- and post-therapy scores on the *Expressive Vocabulary Test – 2nd Edition*. Tables 5 and 6 delineate the mean change in these scores. Figure 3 measured expressive vocabulary and word retrieval, mean level of performance comparison scores.

*Figure 3. Expressive Vocabulary Test, Second Edition (EVT-2) (Williams, 2008).*
Group Characteristics: Phonological Awareness Skills Program Test

Tables 7 and 8 summarize both groups’ mean pre- and post-therapy performance levels on the *Phonological Awareness Skills Program Test* (Rosner, 1999). Mean pre-therapy scores, post-therapy scores, the differences between them, and the associated standard deviations (SD) are listed for the two groups: Modified RAVE-O and Traditional Phonological Awareness Training.

**Table 7**

*Modified RAVE-O Training Group. PASP. Mean Levels of Performance*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASP</td>
<td>10.67</td>
<td>3.78</td>
<td>15.33</td>
<td>10.11</td>
<td>+4.67</td>
</tr>
</tbody>
</table>

**Table 8**

*Traditional Phonological Awareness Training Group. PASP. Mean Levels of Performance*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASP</td>
<td>10.33</td>
<td>10.69</td>
<td>12.67</td>
<td>13.20</td>
<td>+2.33</td>
</tr>
</tbody>
</table>
Group Comparisons: Phonological Awareness Skills Program Test

Figure 4 illustrates each group’s pre- and post-therapy scores on the Phonological Awareness Skills Program Test. Tables 7 and 8 delineate the mean change in these scores. Figure 4 illustrates a comprehensive measurement of phonological awareness skills, mean level of performance comparison scores.

![Figure 4. Phonological Awareness Skills Program Test (PASP) (Rosner, 1999).](image)

Table 9 and 10 summarize both groups’ mean pre- and post-therapy performance levels on the Clinical Evaluation of Language Fundamentals – 4th Edition, Subtest Rapid Automatic Naming (RAN).


Table 9 and 10 summarize both groups’ mean pre- and post-therapy performance levels on the Clinical Evaluation of Language Fundamentals – 4th Edition, Rapid
Automatic Naming subtest (RAN) (Semel, Wiig, & Secord, 2003). Mean pre-therapy scores, post-therapy scores, the differences between them, and the associated standard deviations (SD) are listed for the two groups: Modified RAVE-O and Traditional Phonological Awareness Training.

Table 9

**Modified RAVE-O Training Group. CELF-4. Mean Levels of Performance**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAN/Seconds</td>
<td>105.33</td>
<td>35.13</td>
<td>78.00</td>
<td>17.34</td>
<td>-27.33</td>
</tr>
<tr>
<td>RAN/Errors</td>
<td>1.00</td>
<td>0</td>
<td>3.00</td>
<td>2.64</td>
<td>+2.00</td>
</tr>
</tbody>
</table>

Table 10

**Traditional Phonological Awareness Training Group. CELF-4. Mean Levels of Performance**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Pre-Therapy</th>
<th>Standard Deviation</th>
<th>Post-Therapy</th>
<th>Standard Deviation</th>
<th>Mean Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAN/Seconds</td>
<td>161.67</td>
<td>42.15</td>
<td>111.33</td>
<td>23.75</td>
<td>-50.33</td>
</tr>
<tr>
<td>RAN/Errors</td>
<td>1.67</td>
<td>1.52</td>
<td>2.00</td>
<td>1.73</td>
<td>+0.33</td>
</tr>
</tbody>
</table>

Figures 5 and 6 illustrate each group’s pre- and post-therapy scores on the Clinical Evaluation of Language Fundamentals – 4th Edition, subtest Rapid Automatic Naming (RAN). Table 9 delineates the mean change in these scores.

![Bar chart](chart.png)

*Figure 5. Clinical Evaluation of Language Fundamentals – 4th Edition, subtest Rapid Automatic Naming (RAN) (Semel, Wiig, & Secord, 2003), mean level of performance comparison scores by seconds.*
Figure 6. Clinical Evaluation of Language Fundamentals – 4th Edition, subtest Rapid Automatic Naming (RAN) (Semel, Wiig, & Secord, 2003), mean level of performance comparison scores by errors.
Chapter 4

DISCUSSION

This study was designed to answer the following question: In a school-based speech-language therapy setting is there significant differences in treatment outcomes between contextualized phonological awareness training versus a decontextualized intervention approach? The study included six subjects, described as having considerable delays in reading skills, thus, impacting age-level academic achievement. Each subject participated in twice weekly, 30-minute training sessions for six weeks. Three participants received modified-RAVE-O training, while the other three participants received traditional phonological awareness training. The modified RAVE-O training began with phonological awareness activities delivered in hierarchal order to strengthen participants’ skills to better work with phonemes and rime patterns prior to the introduction of orthographic presentation. Additionally, a pre-selected curriculum story was read to the group twice prior to presenting five core words from the story. Onset and rime drills were then added using cards printed with the five core words, and all of their possible combinations. As the modified-RAVE-O training cycled through its phases, vocabulary, word-webbing, and journal writing activities were integrated in an attempt to increase the participants’ word recognition and retrieval skills. The ultimate intent of the training was to improve the participants’ word attack and passage comprehension skills. Traditional Phonological Awareness Training was delivered in a hierarchal continuum of complex phonological awareness activities, without any relationship to literature.
Since this study included a small number of subjects, any statistical analysis should be viewed with caution. The following discussion of the results presented in Chapter 3 summarizes some important trends revealed by the mean scores from each group.

Dynamic Indicators of Basic Early Literacy Skills (DIBELS), Subtest, Oral Reading Fluency (ORF)

Comparing the participants oral reading fluency skills through pre-and post-training test scores on the DIBELS, subtest ORF, the group receiving modified-RAVE-O training displayed a mean score increase of 11.33, while the traditional phonological awareness training group displayed a higher mean score increase of 16.67. An increase in the number of words read per minute represents an improvement in the ability to decode accurately and fluently with connected text. Therapy in both groups included direct phonological awareness activities; however, the modified-RAVE-O group spent less concentrated time on phonological awareness activities as the training phases evolved into onset and rimes, multiple meanings, word webs, and orthographic activities.

Additionally, during the course of the training one participant from the modified-RAVE-O group had frequent absences, which may have contributed to the lower mean increase for the group.

Peabody Picture Vocabulary Test – 4th Edition (PPVT-4)

Comparing the participants receptive language skills through pre-and post-training test scores on the PPVT-4, the group receiving modified-RAVE-O training
displayed a mean score increase of 0.33, while the traditional phonological awareness training group improved considerably more with a mean increase score of 16.67. Both groups pre-therapy mean standard scores (SS) were very close in range with the modified-RAVE-O group SS of 90, and the traditional phonological awareness training group SS of 91.67. An increase in the ability to understand spoken words is evidence of improved vocabulary acquisition. Post-therapy results indicated the traditional phonological awareness training participants enhanced their vocabulary acquisition concurrent with improving oral reading fluency skills.

**Phonological Awareness Skills Program Test (PASP)**

Comparing the participants phonological abilities through pre-and post-training test scores on the PASP test, the group receiving modified-RAVE-O training displayed a higher mean score increase of 4.67, while the traditional phonological awareness training group displayed a mean score increase of 2.33. Again, both groups pre-therapy mean standard scores (SS) were very similar in range with the modified-RAVE-O group mean SS of 10.67, and the traditional phonological awareness training group mean SS of 10.33. An improvement on the PASP Test may be safely interpreted to indicate improvement on other tasks that depend on phonological awareness skills (Rosner, 1999, p. 2).

**Expressive Vocabulary Test – 2nd Edition (EVT-2)**

Comparing the participants expressive vocabulary skills through pre-and post-training test scores on the EVT-2, the group receiving modified-RAVE-O training displayed a higher mean score increase of 6.67, while the traditional phonological
awareness training group displayed a mean score increase of 5.67. Again, both groups pre-therapy mean standard scores (SS) were similar in range with the modified-RAVE-O group mean SS of 86.00, and the traditional phonological awareness training group mean SS of 88.00. Improved scores on this test of vocabulary knowledge can contribute to an increase in literacy skills.


Comparing the participants rapid automatic naming abilities through pre-and post-therapy training test scores on the CELF-4, subtest RAN, the group receiving modified-RAVE-O training displayed a lower mean decrease of -27.33 seconds, while the traditional phonological awareness training group displayed a higher mean decrease of -50.33 seconds. In the scores for errors pre- and post-therapy the modified-RAVE-O group displayed a mean increase of 2.00, while the traditional phonological awareness training group displayed a mean increase of 0.33. An increase in scores on Rapid Automatic Naming subtest of the CELF-4 indicates an improvement in the ability to automatically activate decoding skills for speed of processing, efficiency of working memory, and fluency and accuracy in reading and writing (Semel, Wiig, & Secord, 2003).
Table 11

Post-Therapy Comparison in Mean Changes of Scores

<table>
<thead>
<tr>
<th>Modified RAVE-O Group</th>
<th>Traditional Phonological Awareness Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIBELS</td>
<td>DIBELS</td>
</tr>
<tr>
<td>Oral Reading Fluency</td>
<td>Oral Reading Fluency</td>
</tr>
<tr>
<td>11.33</td>
<td>16.67</td>
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<tr>
<td>PPVT-4</td>
<td>PPVT-4</td>
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<tr>
<td>0.33</td>
<td>3.67</td>
</tr>
<tr>
<td>EVT-2</td>
<td>EVT-2</td>
</tr>
<tr>
<td>6.67</td>
<td>5.67</td>
</tr>
<tr>
<td>PASP</td>
<td>PASP</td>
</tr>
<tr>
<td>+4.67</td>
<td>+2.33</td>
</tr>
<tr>
<td>CELF-4</td>
<td>CELF-4</td>
</tr>
<tr>
<td>Rapid Automatic Naming/Seconds</td>
<td>Rapid Automatic Naming/Seconds</td>
</tr>
<tr>
<td>-27.33</td>
<td>-50.33</td>
</tr>
<tr>
<td>CELF-4</td>
<td>CELF-4</td>
</tr>
<tr>
<td>Rapid Automatic Naming/Errors</td>
<td>Rapid Automatic Naming/Errors</td>
</tr>
<tr>
<td>2.00</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Outcomes of this intervention training support the usefulness of phonological awareness training with 2nd grade children identified as having reading problems. In summing up the post-therapy comparison scores, it appears the participants of the
traditional phonological awareness training group demonstrated a larger mean increase in oral reading fluency abilities (67.67), and receptive vocabulary skills (3.67). Additionally, the same participants demonstrated an improvement in their ability to rapidly and automatically name shapes and colors with a mean decrease of (-50.33), while increasing their mean error rate by only (0.33). This same group fell behind the modified-RAVE-O group in mean increases in phonological awareness skill, and in expressive language ability. The modified-RAVE-O group on the other hand, demonstrated less improvement (+11.33) in oral reading fluency skills than the traditional phonological awareness training group, and made only a slight improvement in receptive language skills (0.33). Additionally, the modified-RAVE-O group demonstrated an improvement in rapid automatic naming ability with a decrease in time of (-27) seconds, but again, not as substantial as the traditional training group. The modified-RAVE-O group surpassed the traditional training group’s improvement in both phonological awareness skill and expressive language ability. Although the results from this study revealed a more prominent efficiency in phonological awareness training without contextualized therapy, the degree of impact from simple variables likely influenced the results. These variances will be discussed in the following chapter on “Implications.”
Chapter 5

IMPLICATIONS

The findings of this study support the suggestion of Fey, Catts, and Larrivee (1995) that speech-language pathologists should train phonological awareness skills to children who have reading difficulty. The intent of this research was to determine whether or not adding the component of contextualized material to phonological awareness training would better increase the improvement of decoding skills (e.g., more fluent reading). Essentially, the results revealed the participants receiving the traditional phonological awareness training (decontextualized) improved in their ability to decode faster by the end of the six-week training, versus the modified-RAVE-O (contextualized) phonological awareness training participants. The difference of mean score increases between the modified-RAVE-O and the traditional phonological awareness training groups provided a counter perspective on the emerging trend to incorporate contextualized content in phonological awareness therapy activities.

Variable factors which came into play during the course of the six-week training may have influenced the outcome of the study. One factor that possibly contributed to lower mean changes in scores for the modified-RAVE-O group was the number of absences the participants had during the six weeks of training. Participants 1 and 3 each missed one of the two initial readings of the selected story. Since the progression of the training had strict time limitations the two participants were not provided the opportunity of hearing the story read more than once. This early deviation from the training sequence
could have contributed to a disconnect to the core words from the story. Additionally, the same two participants had three more combined absences, one mid-training, and one each in weeks 5 and 6. Although a review of the previous training session was incorporated into each modified-RAVE-O phase, it became evident that absences impacted the retention of previously taught material. The traditional phonological awareness training group had a total of two absences, both by Participant 3. Interesting to note that Participant 3 of the traditional group also received speech-language therapy services twice weekly, for thirty minute group language sessions, and did not appear to demonstrate difficulty retaining previously taught training material. It was quite possible that his training during speech-language services carried over and enhanced his performance in the study group. All six participants received an additional thirty minutes of ‘extended day’ academic support, three days a week, the duration of the study.

Another factor likely adverse to this study was the DIBELS assessment monitoring had only recently been implemented at the Taylor Street School. Prior to DIBELS being introduced in fall 2008, no previous standardized benchmarks of letter-word identification or decoding skills for the participants had been done. In retrospect, administering the DIBELS letter naming fluency, phoneme segmentation fluency, and nonsense word fluency subtests may very well have provided useful information about the participant’s phonemic awareness background.

The study went on to further reveal interesting occurrences that may have also affected the outcome, such as, the modified-RAVE-O participants exceeded the
traditional training group in their scores on the PASP and the RAN assessments. These tests assessed phonological awareness ability, and decoding skill, respectively, and should have parlayed into better results for the modified-RAVE-O training group. The question begs asking…”Why didn’t it?” One hypothesis is that the reduction of carryover of phonological awareness abilities, and decoding skills from pre-testing results to the modified-RAVE-O training results may have been considerably compromised by the increased absences the modified-RAVE-O group had during the six-week training. Another interesting occurrence was the lower level of receptive language improvement the modified-RAVE-O group demonstrated on the post-training testing. Although the group made an overall mean level of performance increase of +0.33, it was far less than the traditional training group mean level of performance increase of +16.67. This large difference could be attributed to the contextualized story being too difficult for the modified-RAVE-O participants to understand, or perhaps the increased language load of the multiple meaning words was too much for their language acquisition device to absorb. After all, the participants were reported to have “problems with reading” which is just a share of the overall continuum of language. Otherwise, as discussed earlier, perhaps the increased number of absences for the modified-RAVE-O group during training prevented a deeper level of language retention.

Typically, research is based on a larger sampling of participants which produce a larger amount of data that is largely more agreeable to statistical scrutiny. In this study it was quite possible that a larger sample of children, coupled with an extended training
period would have been more beneficial in determining participant’s improvement to the
methods of this study. In spite of these limitations, I am reasonably confident that the
improvement of oral reading fluency skills demonstrated by both groups resulted from
the extra phonological awareness training and not solely from experiences in the regular
curriculum. Additionally, this study raised some interesting questions. Because of the
complexity of the modified-RAVE-O training program, and the limited time of twice
weekly, 30 minute sessions this study had to work with, did the modified-RAVE-O
training group have a compromised element of training due to the time constraints inherit
in cycling through all the components of the four phase of the training? Would the
modified-RAVE-O training been more effective if it had been longer in duration, say ten
to twelve weeks, instead of the eight week duration of this study? An interesting research
design might be to increase the number of participants to generate more data, extend the
duration of the training program as well as increase the training session’s time. This
would allow for an enhanced revisit of previous sessions material, and increased practice
time for the phonological awareness piece in each phase of the modified-RAVE-O
training.
APPENDIX A

Parental Consent
To Allow My Child to Participate In a Phonological Awareness Training Study

I agree to allow my child to participate in a six week Phonological Awareness Training (PAT) study to be conducted by Mrs. Lorri Street, a graduate student of the Speech-Language Pathology and Audiology Department, at California State University, Sacramento. Mrs. Street is also a Speech Therapist, who will begin working full time at the Taylor Street School in January, 2009. Phonological awareness is the understanding of the different ways that spoken language can be broken down into smaller parts. Smaller parts of the spoken language include breaking down sentences into words, words into syllables and syllables into individual sounds. When children understand that words can be divided into individual sounds and that sounds can be put together to make words, they will be better able to use this knowledge to improve their reading skills.

The selection of students for this study was determined by the following criteria: 1.) Second grade students who will be between the age of 7 years, and 7 years 11 months, during the six week study period. 2.) Students who have been identified as having below grade-level decoding (reading) skills. 3.) Students who are English only speakers. 4.) Students who have similar academic performance levels. 5.) Students who come from similar socio-economic environments.

I understand that Mrs. Street will administer to my child three individual assessment tests. Three before the training begins and then the same three tests at the completion of the six week training. Scores from the before and after assessment tests will then be compared.

I understand that the before and after assessment testing is important in order to assess my child's ability to visually process and store visual stimuli in working memory, and to measure his/her phonological awareness and vocabulary skills. The total testing time should take no longer than two hours per student--one hour before the beginning of the training and one hour at the completion of the six week training. I understand that during the assessment testing my child might become anxious or frustrated, and that Mrs. Street will allow for frequent breaks during the assessment period, and/or discontinue the assessment based on the individual needs of my child.

I understand that during the six week study my child will be grouped with three other students and provided phonological awareness training two times a week, for 30 minute sessions. I understand that in order not to divert from my child’s daily academic schedule, the training will be conducted immediately after school on Mondays and Fridays. I understand that on Fridays when there is no late bus option to transport my child home, I will be responsible for arranging the pickup of my child at school.

The purpose of this study is to answer the following question: In a speech/language therapy setting, are there significant differences in treatment outcomes between meaningful, literature-based Phonological Awareness Training, versus the traditional non-literature based Phonological Awareness Training? In a literature based PAT approach the intervention is delivered with a direct connection to literature. In a non-literature based PAT approach the intervention is delivered in isolated skill sets with no connection to literature.
I understand that in addition to the information on this consent form Mrs. Street will be available either in person or by telephone to explain any procedures, and answer any questions my child or I may have now, or as the study develops. I understand that my child's participation is completely voluntary and that I may decide not to have my child participate at any time. I also understand that if my child participates and should experience any discomfort during the study, I may stop his/her participation at any time. I understand that Mrs. Street may end my child's participation at any time also. Lastly, I understand that my child and I will not receive any compensation for participating in this study.

Parents Signature ________________________     Date ____________________
(Child’s name), your parent has given permission for you to be a part of a six week reading and word training class with me. During the class I will teach you how to change sounds in words to make new words, work with you on the definition of words and teach you new meanings of words. Also, I will show you how words belong to families, make word webs with you, and teach you to answer who, what, when, where and why questions better. Before and after the training begins I must give you three short tests that will tell me how you are doing in your reading and word skills. You and I will do the tests in the Speech Therapy room, and you can have breaks during the testing time. Also, you can ask for a break anytime you feel you need one. Once the tests are finished we will work together for six weeks after school, on Mondays and Fridays, for thirty minutes each day.

One of the groups of three students will be using a classroom reading book during the training to help build their reading and word skills. The other group of three students will use board games, word building worksheets, and sound changing activities. I want you to know that that even though your parents gave me permission for you to be a part of this training it is okay for you to say no thank you to me. No one will be upset with you if you decide not to do the training.

At this point, I will ask the student if he/she wants to be a part of the training. If the student agrees to participate, he/she will write their initials on the ‘yes’ line and put in the date.

Yes I will participate: ___________________             Date: ______________________
January 5, 2009

Dear Parents of _________________________,

Starting on Monday, January 12, 2009, I will begin providing the extra phonological awareness training we talked about during teacher conference week. The pre- and post-testing will be conducted during weeks 1 and 8. The training will be held twice weekly, for 30-minute sessions during weeks 2-6, for a total of 8 consecutive weeks. Please make arrangements for the transportation home of your child during this period of time. Because I have such a short period of time to provide the, your commitment to having your child present at school during this time will be most appreciated.

Should you any further questions please call my room anytime at 927-5340, ext. 514. Again, I thank you for allowing me this opportunity to assist your child in becoming more practiced in phonological awareness activities.

Regards,

Lorri L. Street, M.S., RPE/CFY Speech-Language Pathologist
Taylor Street School
APPENDIX D

Modified RAVE-O Training

Week 2

Modified-RAVE-O group

Phonological Awareness Activities: At the word level included counting words, identifying missing words from a list, and identifying a missing word in a phrase or sentence. Activities at the syllable level included syllable counting, syllable deleting, syllable adding, syllable reversing, and syllable substituting. Activities at the phoneme level included initial sound matching, blending onset-rimes in monosyllabic words beginning with blends and single consonant, rhyme recognition, sound categorization, matching initial and final sound-to-word, supplying initial and final sounds in words, segmenting initial and final sounds in words, deleting initial and final sounds in words, substituting initial and final sounds in words, segmenting the middle sound in monosyllabic words, and deleting sounds within words. Additionally during week 2, Tomas’ and the Library Lady, a salient language arts curriculum story was read to the participants twice.

Tomas’ and the Library Lady-

Tomas lived with his Mama, Papa, Papa Grande and his little brother, Enrique. His parents were migrant workers. They picked fruit in Texas in the winter and in Iowa in the summer. They were on their way to Iowa for the summer. Tomas had always enjoyed listening to his Papa Grande's stories, and he knew all of them by heart. So, Papa Grande encouraged Tomas to go to the library in Iowa and tell them more stories. The next morning when he reaches the library he becomes very intimidated by the big library.

Well, things change once he meets the library lady. She is so warm and inviting to Tomas that Tomas spends the whole day at the library reading. Using her own card, the library lady checks out two books for Tomas to take home and read. While reading, Tomas gets lost in adventures with dinosaurs.

During the course of the summer, Tomas teaches the library lady some Spanish, while she encourages him to read more books. There is a tearful goodbye as Tomas gives the library lady some pan dulce (sweet bread) and she gives him a book. The summer is ending and it is now time for Tomas’s family to go back to Texas.
Week 3

Modified-RAVE-O group

<table>
<thead>
<tr>
<th>Phonemes</th>
<th>Core Words</th>
<th>Rime Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>pick</td>
<td>-ick</td>
</tr>
<tr>
<td>/d/</td>
<td>dump</td>
<td>-ump</td>
</tr>
<tr>
<td>/l/</td>
<td>light</td>
<td>-ight</td>
</tr>
<tr>
<td>/h/</td>
<td>hot</td>
<td>-ot</td>
</tr>
<tr>
<td>/k/</td>
<td>cold</td>
<td>-old</td>
</tr>
</tbody>
</table>

Possible Words: -ick family: pick, sick, -old family: cold, fold, -ump family: bump, jump, -ot family: got, not, -ight family: right, tight

Orthographic representation

```
pick cold
```
aump light

hot

P – ick
C – old
D – ump
L – ight
H – ot
Week 4

Modified-RAVE-O group

<table>
<thead>
<tr>
<th>Phonemes</th>
<th>Core Words</th>
<th>Rime Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>pick</td>
<td>-ick</td>
</tr>
<tr>
<td>/d/</td>
<td>dump</td>
<td>-ump</td>
</tr>
<tr>
<td>/l/</td>
<td>light</td>
<td>-ight</td>
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<tr>
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<td>hot</td>
<td>-ot</td>
</tr>
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<td>cold</td>
<td>-old</td>
</tr>
<tr>
<td>/t/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/m/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Possible New Words: -ick family: slicker, pickles, -old family: coldest, folder, -ump family: grumpy, jumping, -ot family: forgotten, hotter, -ight family: brighter, frighten

Multiple Meanings

pick = tool, or an action

dump = to pour something, place to take garbage

light = something not heavy, lamp

hot = outside temperature, sensation

cold = to be sick, outside temperature
Week 5

Modified-RAVE-O group

<table>
<thead>
<tr>
<th>Phonemes</th>
<th>Core Words</th>
<th>Rime Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>pick</td>
<td>-ick</td>
</tr>
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<td>dump</td>
<td>-ump</td>
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<td>-ot</td>
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<tr>
<td>/k/</td>
<td>cold</td>
<td>-old</td>
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Possible New Words: -**ick** family: cricket, quickest, stickers, -**old** family: goldfish, penholder, scolding, -**ump** family: umpire, pumpkin, dumpling, -**ot** family: robotic, cottage, lottery, -**ight** family: delight, rightful, frightening

Multiple Meanings
pick = steel, tool, or an action, small piece of plastic used to pluck a guitar
dump = to let fall, a place to take garbage, to sell in quantity at very low price
light = not heavy, electric light, lacking stability
hot = outside high temperature, body sensation, something illegally obtained
cold = to be sick, outside low temperature, lack of human emotions
Core Words WH-?’s
Who might use a pick at their work?
Where would you find a pick?
Why do people pick teams?
What do you do when you have a cold?
Where can you go that is very cold?
Why do people go to the dump?
When would you dump out paint?
Who would have a light in their house?
Why are balloons light?
When you hold a balloon what does it do?
What can you do when it’s hot outside?
Where do the police take a hot car?
What would you do if someone tried to give you a hot Xbox game?
Week 6

Modified-RAVE-O group

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<th>Phonemes</th>
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New Words: -ick family: ticket, snickers, -old family: golden, scaffolding, -ump family: humpty-dumpty, trumpet, -ot family: otter, ottoman, -ight family: lightening, plight

Multiple Meanings
pick = steel, tool, or an action, small piece of plastic used to pluck a guitar
dump = to let fall, a place to take garbage, to sell in quantity at very low price
light = not heavy, electric light, lacking stability
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Core Word Sentences
My ____________ needs to be sharpened.
Will you ____________ me for your team?
The weather outside was very ____________.
I have a ____________ and I feel terrible.
__________ all of your marbles onto the floor.
The ____________ smelled like rotten food.
The balloons were very ____________.
Turn on the _________ so you can see better.
The policeman said the car was _________.
I was very _________ after playing at recess.
APPENDIX E

Traditional Phonological Awareness Training

Week 2

Rhyming Activities:
Listening and discriminating rhyming words.
Rhyme picture matching without print.
Identifying two out of three printed rhyming words.
Producing rhyming words when given a stimulus word.

Week 3

Sentence Segmentation Activities:
Breaking sentences into individual words by means of clapping out the words in the given stimulus sentence.

Listening to the stimulus sentence and putting together colored the cubes representing the number of words heard in a sentence.

Week 4

Syllable Segmentation and Blending Activities:
Listening to and discriminating words into syllables by clapping out the syllables

Listening to stimulus words and putting together colored cubes representing the number of syllables heard.

Syllable blending activities had participants listen to stimulus syllables and put them together to identify the word. For example: Ti-ger – (Say and clap “ti-ger”) The participants were also asked to identify how many syllables they heard in a word. For example: “How many parts?”(two). “Tiger” has two syllables (ti-ger).

Syllable deleting, adding, reversing and substituting were other activities included in the syllable segmentation and blending tasks.
Week 5

Onset rime and Syllable Blending & Segmentation Activities:
Onset-rime introduced the participants to the idea of word families, and helped develop their concept of “rime” versus “rhyme.”

Week 6

Blending and Segmenting Individual Phoneme Activities:
Blending phoneme activities included listening to a sequence of individual sounds and combining them to produce a word (e.g., /b/a/d/” for “bad”).

Other activities at the phoneme level included initial and final sound matching, supplying initial and final sounds to word parts, deleting initial and final sounds in words, substituting initial and final sounds in words, and deleting sounds within words.
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