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The Effects of a Parent Intervention on the Phonological Awareness Skills of Kindergarten Students

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The Effects of a Parent Intervention on the Phonological
Awareness Skills of Kindergarten Students

by

Andrea Ofiara

A thesis submitted in partial fulfillment
of the requirements for the degree of
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Table of Contents

List of Tables iv
List of Figures v
Abstract vi

Chapter One 1
Importance of Early Literacy Skills 2
Phonological Awareness as an Early Literacy Skill 3
Parent Involvement in Literacy Development 7
Purpose and Rationale of the Study 8
Hypothesis 9
Research Question 9

Chapter Two 10
Phonological Awareness Interventions 10
Phonemic Awareness in Young Children 11
Ladders to Literacy 14
  Kindergarten study 15
  First-grade follow-up 16
Road to the Code 17
Sound Foundations 20
  Initial training study 21
  Kindergarten follow-up 23
  First-grade follow-up 25
  Second-grade follow-up 26
  Third-grade follow-up 27
  Fifth-grade follow-up 27
  Trial pre-school evaluation 28
  Parent implementation of Sound Foundations 29
Conclusions 30

Parent Involvement in Early Literacy Development 31
Early Literacy Experiences and the Home Environment 31
Parent-Based Reading Interventions 35
Parent-Based Phonological Awareness Interventions 40
Conclusions, Recommendations, and Statement of Purpose 43
Chapter Three  
Participants  
Instruments  
  Independent Variable  
  Dependent Variable  
  Social Validity Measures  
Design  
Procedures  
  Participant Recruitment and Selection  
  Screening  
  Data Collection  
  Baseline  
  Parent Training  
  Intervention  
  Procedural integrity  
  Follow-up Phase  
Data Analysis  

Chapter Four  
Participants’ Phonological Awareness Development  
  Student 1  
  Student 2  
  Student 3  
Treatment Integrity  
Social Validity  

Chapter Five  
Summary of Results and Relation to Existing Literature  
  Student outcomes  
  Design  
  Social validity and treatment integrity  
Implications for Practice  
Limitations  
Directions for Future Research  
Conclusion  

References  

Appendices  
  Appendix A: Parent Social Validity Scale  
  Appendix B: Child Social Validity Scale  
  Appendix C: Participant Recruitment and Consent for Screening Letter  
  Appendix D: Parental Informed Consent  
  Appendix E: Agenda for Parent Instruction Session  
  Appendix F: Participant Demographic Information
Appendix G: Intervention Schedule 112
Appendix H: Intervention Activities Checklist 114
Appendix I: Telephone Checklist 115
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Descriptive Statistics for Phonemes Per Minute for Student 1</td>
<td>65</td>
</tr>
<tr>
<td>Table 2</td>
<td>Slope and Level Change for Phonemes Per Minute for Student 1</td>
<td>65</td>
</tr>
<tr>
<td>Table 3</td>
<td>Descriptive Statistics for Phonemes Per Minute for Student 2</td>
<td>67</td>
</tr>
<tr>
<td>Table 4</td>
<td>Slope and Level Change for Phonemes Per Minute for Student 2</td>
<td>67</td>
</tr>
<tr>
<td>Table 5</td>
<td>Descriptive Statistics for Phonemes Per Minute for Student 3</td>
<td>69</td>
</tr>
<tr>
<td>Table 6</td>
<td>Slope and Level Change for Phonemes Per Minute for Student 3</td>
<td>69</td>
</tr>
</tbody>
</table>
The Effects of a Parent Intervention on the Phonological Awareness Skills of Kindergarten Students

Andrea Ofiara

ABSTRACT

This study examined the efficacy of the Sound Foundations program, implemented by parents, for increasing phonological awareness (PA). Three kindergarten students identified with PA deficits and their mothers served as participants. Parents implemented Sound Foundations twice per week for five and a half weeks. The effects of the intervention were evaluated using a multiple baseline across participants design. PA was measured using the Phoneme Segmentation Fluency measure of the Dynamic Indicators of Basic Early Literacy Skills. Results showed that two students showed increases over time in phonemes per minute after the parent intervention. A third student did not show substantial improvement. None of the students reached established levels of PA. Treatment integrity and social validity data also were collected. These data indicated that parent participants carried out the intervention appropriately and that both parents and student liked the intervention program.
Chapter One

Introduction

The ability to read in the United States and throughout the world has become a necessity of life. Many simple, routine tasks require reading proficiency: interpreting road signs, reading instructions, finding information on the internet, learning from information presented in textbooks, etc. The inability to complete such tasks halts performance in every aspect of life, most importantly in school and job performance. It becomes clear that to succeed in our culture one must be able to read. However, there is reason to believe that a large portion of our nation’s children will be unable to keep up with our literate society. Based on the results of the National Assessment of Educational Progress (NAEP), a nationwide assessment test, the National Educational Goals Panel reported that only 31% of 4th graders and 32% of 8th graders scored at the proficient level or higher in reading (National Center for Educational Statistics, 2003). The National Institute of Child Health and Human Development (NICHD) reported that about 20-30% of our nation’s children have significant difficulties learning to read (Lyon, 1998). That equates to 10 million children who cannot master the task of reading. The NICHD also reported that of those children who have difficulty with reading, “from 10-15 percent eventually drop out of high school; only 2 percent complete a four-year college program” (Bock, 1998, p. 1).
Importance of Early Literacy Skills

Because of the serious implications that failure to learn to read has on a child’s future, much effort has been focused on the process by which children develop literacy skills. Research by Juel (1988) demonstrated the existence of reading trajectories or stable paths of reading progress. Juel found that the probability that a poor reader in the first grade would remain a poor reader in the fourth grade was .88. Furthermore, Good, Simmons, and Smith (1998) examined curriculum-based measurement (CBM) reading data of first through fifth grade students in a Minnesota school district. For an entire school year, students in grades one through five were assessed with CBM materials monthly. Assessment involved measuring oral reading fluency by having the students read orally for one minute from a word list. These oral reading fluency data provided a picture of the reading trajectories of the average (middle 10%) and low (lowest 10%) readers for all five grades. At the beginning of first grade, the rates of progress of average and low readers were approximately the same. However, by the end of first grade and beginning of second grade, the average readers’ rate of progress increased more rapidly than the low readers’ rate of progress. This discrepancy appeared to increase over time. By the end of fifth grade, there was a large discrepancy between the middle and low readers’ rate of progress. Likewise, a longitudinal study by Badian (1988) followed children’s reading progress from first through eighth grade. This study determined that, although all of the children showed similar progress in first grade, reading performance for poor readers was determined by third grade. By eighth grade, the poor readers were performing at four to five grade levels below their peers.
Research on stable reading trajectories and on the skill discrepancy between average and poor readers supports the idea of the “Matthew Effect,” that children who are initially poor readers remain poor readers throughout the course of their schooling and do not catch up to their peers who are good readers (Good et al., 1998; Stanovich, 1986). An explanation of this effect is that poor readers are exposed to less reading material and experience less motivation to read (Good et al., 1998; Stanovich, 1986). In support of this explanation, Juel (1988) found that good readers had been exposed to an average of 18,681 words in their basal reader whereas poor readers had been exposed to only 9,975 words. The data collected on the students in the Minnesota school district indicate that poor readers do make progress in reading; however, poor readers begin with lower skills and improve their skills at a slower rate than average readers (Good et al., 1998).

Furthermore, Marilyn J. Adams (1990) states, “the likelihood that a child will succeed in first grade depends most of all on how much he or she learned before getting there” (p. 82). A child’s ultimate ability to read is highly dependent on their early literacy experiences and skills. Therefore, there is a need to target children who are experiencing difficulty when first learning to read in order to change the course of their reading trajectory and to prevent irreparable future impairment. The solution, then, to our nation’s reading woes may be to intervene early to identify those students who are lagging behind and to provide them with the early literacy skills necessary to become better readers (Good et al., 1998).

*Phonological Awareness as an Early Literacy Skill*

The first step in developing effective prevention and intervention programs in early literacy is to explicate what skills are involved in early literacy and promote future
reading success. An abundance of research and interest exists in this area (e.g., Adams, 1990; Foorman, Francis, Shaywitz, Shaywitz, & Fletcher, 1997; Good et al., 1998; National Reading Panel, 2000; Snow, Burns, & Griffin, 1998; Strickland & Shanahan, 2004). A culmination of the major findings suggests that there are several foundation literacy skills that predict successful reading, including phonological awareness, the alphabetic principle, awareness of print, vocabulary knowledge, and the ability to read with fluency and accuracy. The National Early Literacy Panel (NELP) delineated 11 preschool skills that correlate highly with successful early literacy development: alphabetic knowledge, print knowledge, environmental print, invented spelling, listening comprehension, oral language/vocabulary, phonemic awareness, phonological short-term memory, rapid naming, visual memory, and visual perceptual skills (Strickland & Shanahan, 2004). Of these foundation skills, phonological awareness is the skill correlated most consistently with reading achievement (Foorman et al., 1997; MacDonald & Cornwall, 1995; Muter & Snowling, 1998).

Phonological awareness has been defined as “the general ability to attend to the sounds of language as distinct from meaning” (Snow et al., 1998, p. 52) and as “sensitivity to the sound structure of words” (Foorman et al., 1997, p. 250). Beginning readers have to meet the crucial milestone of understanding that the words they hear can be broken down into smaller sounds (Shaywitz, 2003). Children who have fully developed phonological awareness can recognize spoken words that begin and end with the same sounds, segment words into their sounds, add or remove certain sounds from words to make new words, and recognize rhyming words. In understanding the role of
phonological awareness in the process of learning to read, the following explanation is useful:

The proper analogy for learning to read is learning music notation, or Morse code, or Braille, in which mastery of a set of symbols comes first. Children should first learn the letters and letter combinations that convey the English’s language’s forty-four sounds; then they can read whole words by decoding them from their component phonemes. (Lemann, 1997, p. 129)

A phoneme can be defined as “the smallest functional unit of sound. There are 44 phonemes in the English language, including letter combinations such as /th/” (Behrman, 2002). It is important to note that phonological awareness is a necessary skill, but it is not the only skill that contributes to the process of reading.

Consistent with the research that showed the existence of stable reading trajectories (Juel, 1988), phonological awareness also has been found to be a stable reading skill that predicts future reading ability. Children who experience difficulty learning to read display two characteristics: (a) stable reading trajectories that show a slower rate of progress than their peers, as mentioned previously, and (b) difficulty with the sound structure of language (Good et al., 1998). Adams (1990) asserted that “the child’s level of phonemic awareness on entering school may be the single most powerful determinant of the success she or he will experience in learning to read and of the likelihood that she or he will fail” (p. 304). For example, Wagner, Torgesen, and Rashotte (1994) reported that the year-to-year stability coefficients for phonological sensitivity was .83 from kindergarten to first grade and .95 from second grade to third grade and from third grade to fourth grade. Also, it was reported by Foorman et al.
(1997) that children’s decoding skills, comprised of phonological awareness and familiarity with letters, in first and second grades were correlated significantly with their reading comprehension ability throughout their school years through the ninth grade. They also reported that “between 25% and 36% of the variability in grade 9 comprehension was accounted for by early decoding skills” (p. 249).

In further support of this idea, MacDonald and Cornwall (1995) conducted a follow-up study with teenagers who had taken part in a study in kindergarten. This follow-up study re-evaluated 24 of the original participants with various measures of reading, spelling, and phonological awareness abilities. It was found that at age 17 years, the students’ scores on the phonological awareness measures correlated significantly with their scores on the reading and spelling measures. More importantly, this research revealed that the students’ phonological awareness scores at kindergarten served as predictors of their word identification and spelling skills at age 17 years. After controlling for socioeconomic status and scores on another measure used in the correlation, it was found that the scores on the phonological awareness measure administered in kindergarten correlated significantly with reading and spelling scores earned at age 17 years. Scores on the kindergarten phonological awareness measure accounted for approximately 25% of the variance in reading and spelling skills at age 17.

A longitudinal study conducted by Muter and Snowling (1998) found similar results. In this study, 34 children were followed from age four to age nine years. At ages four, five, and six years, the children completed various measures of phonological awareness. At age nine years, they were again assessed with the phonological awareness tasks as well as with a measure of reading accuracy. The results bolstered the idea that
phonological awareness skills remain stable over the course of development. Phonological skills as measured at ages five and six years successfully predicted reading accuracy at age nine years and discriminated, with 80% precision, amongst good and poor readers. Interestingly, the measures at age four years did not serve as long-term predictors of reading ability. The findings serve to alert educators to the most appropriate age at which to screen for reading difficulties. From this study, it appears to be beneficial to delay screening until the end of the preschool years.

As demonstrated repeatedly by the research, phonological awareness skills of young children are highly predictive of reading and spelling abilities in their later years. The early development of phonological awareness predicts children’s likelihood of succeeding or failing to develop adequate literacy skills. It can be concluded that early intervention in reading would be most beneficial when children with phonological awareness deficits are targeted for remediation.

**Parent Involvement in Literacy Development**

Early reading programs are frequently promoted as one of the best ways for parents to encourage reading development and interest in their child. It is not uncommon to witness a public service announcement in which a noted celebrity appeals to parents, suggesting that reading to a child at bedtime or throughout the day will help the child develop a lasting commitment to reading. However, parent reading programs tend to be focused towards helping children develop a fundamental interest in the reading process. Less common are programs that work to help create an intervention that parents can use to promote reading in children who have manifested reading difficulties (Adams, 1990; Powell-Smith, Stoner, Shinn, & Good, 2000). Often, once a reading disorder has
developed, parents form a mindset that this disorder is beyond their ability to successfully address and treat themselves, and the child’s reading progress is left in the hands of teachers and reading specialists (Duane, 1999).

Studies indicate that this preconceived aversion by a parent helping their children with reading difficulties is ill-informed. Reading strategies that identify the student’s reading difficulty and help train parents in methods that will alleviate the problem have proven successful (e.g., Fielding-Barnsley & Purdie, 2003; Leach & Siddall, 1990; Powell-Smith et al., 2000; Wilks & Clarke, 1988). Indeed, one of the features noted by the majority of these researchers is that parent-facilitated reading strategies are actually more effective due to the proximity of the parent to the child, the establishment of a routine, and the awareness that a parent has regarding their child’s reading performance and aversion strategies (e.g., methods used by the child to avoid reading sessions).

**Purpose and Rationale of the Study**

While information exists which indicates that parent intervention approaches can aid the development of early literacy skills, there is not much information to identify the successful application of a phonological awareness approach with parents. The intention of this study is to identify whether a parent-applied reading program in phonological awareness helps to improve student acquisition of phonological awareness skills. The efficacy of the phonological awareness program *Sound Foundations* (Byrne & Fielding-Barnsley, 1991) for use with parents will be examined. Three kindergarten students who are at-risk for reading failure and who have deficits in phonological awareness will be targeted for the parent intervention. Because strong evidence exists on the effectiveness of the *Sound Foundations* program with groups of children, the present study will use a
multiple baseline design to measure the effects of the *Sound Foundations* program implemented by parents on individual children over time.

**Hypothesis.** This study was designed to address the following hypothesis: Students receiving *Sound Foundations* training implemented by their parents will show an increase in phonological awareness skills, as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), compared to baseline scores on these measures.

**Research Question.** This study intends to examine the following question: Will kindergarten students receiving *Sound Foundations* training implemented by their parents show an increase in phonological awareness skills, as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), compared to baseline scores on these measures?
Chapter Two

Literature Review

The purpose of this chapter is to examine the literature on phonological awareness intervention programs, general parent-based reading interventions, and parent-based phonological awareness interventions. This chapter has been divided into two major sections. The first section will review the efficacy of four research-based phonological awareness interventions. The second section will discuss why home literacy activities are important and will review general parent-based reading interventions and, less common, phonological awareness parent-based interventions. Conclusions, recommendations, and a statement of the purpose of the present study will follow the review of the literature.

Phonological Awareness Interventions

There are five features that exemplify effective phonological awareness interventions (Good et al., 1998). For a phonological awareness program to be successful, it must include the following criteria: (a) begin instruction with phonemes rather than with larger units such as words; (b) provide multiple examples for identifying a single phoneme before teaching a different phoneme; (c) model phonological awareness before students practice and allow students to practice phonemes orally; (d) include instruction in sound identification, blending and segmenting, and end with the integration of letter-sound correspondence; and (e) use concrete materials to provide a visual focus.
and aid the memory. Additionally, effective programs should have research-based evidence of the program’s efficacy (Good et al., 1998).

A variety of early intervention reading programs have been developed to focus on teaching children phonological awareness. Four of these programs, which each demonstrate research-based evidence of effectiveness with target children and possess at least four of the five criteria of effective phonological awareness programs, will be included in this literature review. The programs that will be discussed are: (a) *Phonemic Awareness in Young Children*, a classroom curriculum originally developed in Sweden (Lundberg, Frost, & Petersen, 1988) and adapted for use in America classroom (Adams, Foorman, Lundberg, & Beeler, 1998); (b) *Ladders to Literacy*, a preschool and kindergarten program (Notari-Syverson et al., 1998; O’Connor, Notari-Syverson, & Vadasy, 1998b); (c) *Road to the Code*, a classroom curriculum designed for kindergarten teachers’ use (Blachman, Ball, Black, & Tangel, 2000); and (d) *Sound Foundations*, a program developed and tested in Australia for use with small groups of children (Byrne & Fielding-Barnsley, 1991).

**Phonemic Awareness in Young Children**

In 1997, a research team released the newly updated version of *Phonemic Awareness in Young Children: A Classroom Curriculum* (Adams et al., 1998). This program takes the position that an awareness of phonemes and the ability to apply phonemic awareness accurately is fundamental to reading, written language development, and comprehension. However, the researchers argue that approximately 25% of American students do not reach an adequate awareness of phonemes by the time they enter third grade. Worse, these students are generally allowed to “slip through the
“cracks” in the education system, thus setting themselves up for failure in reading and language comprehension later in their academic careers.

The program is intended for implementation in kindergarten, first-grade, and special education classrooms. While the authors indicate that it can be used up through the third grade, it is most successful when applied in classrooms with younger students. The program itself is directed towards educators (there are cautions against parents using the program without educator support).

The exercises in the program are designed to encourage phonological awareness through games or play-oriented strategies. The authors develop and outline strategies and a sequence in which the students can acquire phonemic awareness through language games, listening games, rhyming, syllables awareness, and sound identification. All activities lead to a step-by-step progression to overall awareness of phonemes. One of the points that should be stressed is that many of these games are already used in classrooms across the country, but as the authors suggest are not identified specifically as phonological awareness strategies.

The program was synthesized as the result of a cumulative series of experiences by the authors involved. While the authors themselves did not conduct active research with the program, they did prepare an excellent synthesis of information pertaining to the implementation of phonemic awareness in the general literature. This research synthesis appears in the first chapter of the program’s manual. Any educator or parent seeking to expand their understanding of what phonological awareness strategies are and how they are best applied in a learning context would do well to read the review of the literature presented in this manual.
Foorman et al. (1997) used the *Phonemic Awareness in Young Children* curriculum in their study of kindergarten classes. The kindergarten children that were targeted were either at-risk for reading failure because of social and economic disadvantage, identified with a reading disability through special education, or identified at-risk through Title I programs for children with reduced social and economic circumstances. Seven kindergarten teachers in two Title I schools were trained in how to implement this program in their classroom. Four kindergarten classrooms that were not implementing the phonological awareness curriculum served as the control group. Children from each of the groups, 100 from the experimental and 81 from the control, were selected randomly and assessed four times during the school year. The children were assessed with Wagner et al.'s (1994) phonological synthesis and analysis tasks which measure blending onset-rhyme units into words, blending phonemes into words, blending phonemes into nonwords, first sound comparison (e.g., "Which of these pictures — drum, tie, and cup — start with the same sound as this picture, tool?"), phoneme elision (e.g., “Say meet without saying /t"”), sound categorization (e.g., "Which word does not sound like the other ones in `hop-tap-lop'?"), and phoneme segmentation (e.g., "Tell me each sound in the word *ate* in the order that you hear it"). The results showed that although both groups evidenced growth in phonological analysis, the growth of the experimental group was greater by the end of the year compared to the growth of the control group. The experimental group’s growth was attributed to the effects of the intervention while the control group’s growth, which was not as great, was attributed to maturation. The results of this study are promising, but long-term follow-up is needed to measure whether growth is maintained and whether increased phonological awareness
transfers to improved reading ability and reading comprehension. Additionally, based on the authors’ own cautions, this program is not easily adaptable for use with non-educators due in part to its time intensity.

**Ladders to Literacy**

While a form of education that is not specifically based in phonological awareness, the *Ladders to Literacy* approach is a program spanning the preschool and kindergarten years (Notari-Syverson et al., 1998; O’Connor et al., 1998b). This program is still comparatively new and was developed as a response to the “whole language” method of instruction. The main purpose of the *Ladders to Literacy* curriculum is to integrate literacy and language into the daily home, school, and community environments of young children. The curriculum provides a guide for teachers to integrate early literacy activities within the daily classroom routine. Each activity is designed to focus on a specific early literacy or language skill, such as print awareness, metalinguistic awareness, or oral language. The authors developed this curriculum for the inclusive classroom, which suggests that the lesson plans are highly adaptive to the educational constraints placed on teachers by the students in the class. Teachers are provided ways to implement early literacy activities to meet the needs of children at varying developmental levels. *Ladders to Literacy* also provides suggestions for home activities to encourage parental involvement in building early literacy skills and to reinforce skills taught in the classroom. An example of an activity provided in *Ladders to Literacy* is “Clap the Syllables.” Through clapping the syllables of the children’s names or objects in the classroom, children learn that words are made up of sound parts. Two studies have examined the efficacy of *Ladders to Literacy*. 

14
Kindergarten study. Kindergarten children enrolled in three different types of programs participated in this study (O’Connor, Notari-Syverson, & Vadasy, 1996). The three types of programs included general education classes, classes comprised of children repeating kindergarten, and self-contained classes for children with mild disabilities (including mild mental retardation, behavior disorder, and learning disability). The experimental group classrooms received instruction by the teacher with phonological awareness activities from Ladders to Literacy for six months. Teacher training consisted of ten inservice trainings across the school year. The teachers in each of the three different types of programs were taught to implement the same activities at the same pace. The control group classrooms used the regular reading curriculum already being used in the classroom.

Children were assessed pre-test and post-test with the following measures: (a) receptive vocabulary (Peabody Picture Vocabulary Test – Revised); (b) phonological measures including assessment of syllable deletion, blending, first sound identification, segmenting, and rhyme production; and (c) the Letter-Word Identification and Dictation subtests from the Woodcock-Johnson Tests of Achievement – Revised to measure reading and writing development. There were several findings from this study. First, children who received instruction with the phonological awareness activities from Ladders to Literacy scored higher on the blending tests, the segmenting tests, and the reading and writing measures on the Woodcock-Johnson Test of Achievement – Revised, regardless of program in which they were enrolled (i.e., general education vs. special education). However, it is cautioned that the gains the children with disabilities made did not bring them up to the level of typical peers. The children with disabilities made smaller gains
and had lower skills at the end of the school year as compared to their typical peers.

Second, children who were repeating kindergarten made more gains than children with disabilities, although this difference could be due to the repeating kindergarten students’ older age and second exposure to kindergarten. Third, phonological skills from pre-test to post-test were not affected by class placement (i.e., self-contained or inclusion) or by type of disability for children with disabilities.

First-grade follow-up. A second study was completed to examine the long-term effects of intervention with Ladders to Literacy (O’Connor, Notari-Syverson, & Vadasy, 1998a). At the end of their first-grade year, 80 of the original 90 children from the original treatment and control groups and 16 of the 17 children in self-contained classes were re-evaluated. The measures used during this first-grade follow-up included: (a) phoneme segmentation fluency; (b) the Letter-Word Identification, Word Attack, and Dictation subtests from the Woodcock-Johnson Tests of Achievement – Revised measuring reading and writing; (c) oral reading fluency; and (d) spelling (the Predictable Word portion of the Test of Written Spelling-2).

Results indicated differential effects for children with and without disabilities. Children without disabilities no longer showed differences between the experimental and control group on any of the measures. Children with disabilities who received treatment scored higher than untreated children on the measures of word identification, dictation, word attack, and spelling. As in the first study, outcomes for children with disabilities were not affected by class placement (i.e., self-contained or inclusion). Amongst the authors’ conclusions, it was suggested that phonological awareness intervention may
prove beneficial during early literacy development in kindergarten and that children with disabilities may require more intense and frequent instruction than their typical peers. *Road to the Code*

*Road to the Code* (Blachman et al., 2000) is an 11-week program for teaching phonemic awareness and letter sound correspondence. Developmentally sequenced, each of the 44 15-20-minute lessons features three activities, Say-It-and-Move-It, Letter Name and Sound Instruction, and Phonological Awareness Practice, that give students repeated opportunities to practice and enhance their beginning reading and spelling abilities. After a brief introduction to the theoretical practices of phonics awareness, as well as a review of the literature that is used to justify their approach, the program manual provides a series of lesson plans for the educator. These plans are remarkably simple. For example, the first lesson plan identifies the Say-It-and-Move-It strategy in which the teacher models the correct way to segment the target word. The target word is spoken and then each sound of the word is elongated while a disk is moved for each sound. The majority of the lesson plans within this curriculum are as simple as this Say-It-and-Move-It strategy. *Road to the Code* involves a progression of phonics elements, rather than a large- scale introduction to the forty- four phonemes. Over time, the students are provided the smallest bits and pieces of language and asked to gradually build upon what phonics elements they have already learned to enrich their progress.

Since being published in 2000, there have not been any studies exploring the efficacy of the *Road to the Code* curriculum. However, *Road to the Code* is based on more than 10 years of research in kindergarten and first-grade classrooms (e.g., Ball &
The lessons and activities that make up the *Road to the Code* program were first developed and tested by Ball and Blachman (1988). A total of 151 kindergarten children participated in this study, which compared phonemic awareness training (experimental group) to language-based activities (control group 1) and no intervention (control group 2). At this time, the intervention was a seven-week program consisting of 20-minute phoneme segmentation lessons and designed for use with small groups of children. The foundation activities used were virtually the same as the activities that comprise the current program: say-it-and-move-it segmentation activities, segmentation-related activities, and letter name/sound training. Prior to intervention, the students were assessed with measures of vocabulary (*Peabody Picture Vocabulary Test – Revised*), word identification (the Word Identification subtest from the *Woodcock Reading Mastery Test*), phoneme segmentation skills, and letter name and sound knowledge. The students selected did not differ on their pre-intervention vocabulary and word identification skills. A regular word list was added to the testing battery post-intervention. An analysis of covariance indicated significant differences on the phoneme segmentation test. The experimental group performed significantly better on the phoneme segmentation test than both control groups. There were no differences between groups for letter name knowledge. An analysis of covariance indicated significant differences for letter sounds knowledge. Both the experimental group and control group 1 (language-based intervention) performed higher for letter sounds knowledge than control group 2 (no
treatment). Additionally, the experimental group showed superior ability to read words, as measured by the Word Identification subtest and the regular word list.

As the phonological awareness activities were expanded and developed further, studies to test their effectiveness with teacher-implementation were conducted. For example, Blachman et al. (1994) trained kindergarten teachers and their instructional assistants to implement phonological awareness activities to small groups of children in their classrooms. The teachers and students were chosen from four low-income, inner-city schools (84 children in the experimental group and 75 children in the control group). Teachers and assistants were trained to implement the phonological awareness program over a series of seven, two-hour inservices. The experimental group students received lessons in small groups of four to five students, 15 to 20 minutes daily, four times per week. The program had been expanded to eleven weeks, although it consisted of the same types of activities as the initial study. The measures used to assess the students in this study were the same at the initial study, with the addition of a regular nonwords reading test and a five-word spelling test. Results were overwhelmingly positive. Children who received intervention performed better on the measures of phoneme segmentation, letter names, letter sounds, reading regular words, reading regular nonwords, and spelling.

Clearly, research has shown that the activities that comprise Road to the Code can improve kindergarten students’ phonological awareness skills and can be implemented successfully in classrooms by teachers and teachers’ assistants.
Sound Foundations

*Sound Foundations* was developed in Australia as a program designed to teach phonological awareness to young children. One of the most critical elements of the program is the creation of phoneme identity, in which students are trained to identify specific phonemes in graphic, written, and verbalized formats. *Sound Foundations* focuses on teaching phoneme recognition across words (e.g., pointing out two words that start or end with the same sounds). The phonemes that receive the most attention during the course of the intervention are the consonant sounds /s/, /l/, /sh/, /m/, /p/, /t/, and /g/, and the vowel sounds /e/ (as in bet) and /æ/ (as in bat). The program’s materials include a tape with songs and jingles containing the targeted phonemes, posters with pictures of items beginning and ending with these sounds, worksheets that have the children locate and color in objects displaying the desired sounds, and card games that allow children to apply their knowledge. An example of the *Sound Foundations* methodology is to provide pictorial representation of multiple elements from the same general context, such as pictures of groups of food on a poster. The students are asked to approach the poster and identify the foods which start with the /s/ sound, such as spaghetti or sausage. The worksheets reinforce this same concept.

*Sound Foundations* has undergone much research by its developers (Byrne, 1998; Byrne & Fielding-Barnsley, 1991, 1993, 1995; Byrne, Fielding-Barnsley, & Ashley, 2000). In addition to the initial study of the effectiveness of *Sound Foundations* with preschool students (1991), Byrne and Fielding-Barnsley conducted several follow-up studies to assess the long-term effectiveness of their program. The children involved in the initial training program were re-evaluated at the end of kindergarten (Byrne &
Fielding-Barnsley, 1993), first grade (Byrne & Fielding-Barnsley, 1995), second grade (Byrne & Fielding-Barnsley, 1995), third grade (Byrne, 1998), and fifth grade (Byrne et al., 2000). This extensive long-term follow-up is what distinguishes the *Sound Foundations* program from other early literacy and phonological awareness programs.

To measure effects of the program when implemented by persons other than the authors themselves, a trial evaluation of its implementation by preschool teachers was conducted (Byrne & Fielding-Barnsley, 1995). Additionally, exploration into the use of the program with parents is currently underway (University of New England at Australia, 2003).

*Initial training study.* In Byrne and Fielding-Barnsley’s (1991) first evaluation of the program, 64 preschool children were taught by the experimenters with the methods of *Sound Foundations*, and 62 preschool children, serving as the control group, were taught using the program’s materials focusing on semantic rather than phonetic activities. The children were divided up into small groups of four to six and trained over the course of twelve weeks. Due to time constraints, only five consonant sounds (/s/, /m/, /t/, /l/, and /p/) and one vowel sound /æ/ were taught to the children in the experimental group. For the experimental group training sessions, a sound in the initial position of words was introduced one week, followed by the same sound the next week in the final position of words. Sessions lasted between 25 and 30 minutes. The experimenter began each session by reciting short songs that contained the targeted phoneme and by discussing how the sound is made. Each child was then required to identify something on the corresponding poster beginning (or ending) with the targeted phoneme. Each session ended with the children completing a worksheet requiring them to color in pictures.
beginning (or ending) with the targeted phoneme. In the last week of the intervention (the 12th week), the card games were introduced to the children. For the control group sessions, the children were read stories and asked to identify categories of items (e.g., animals, colors) on the posters and worksheets.

Pretesting of all children in this first study included assessments of the following domains: (a) verbal development, (b) knowledge of book and print conventions, (c) identification of six common signs, (d) knowledge of 26 letter names and their common sounds, (e) rhyme recognition, and (f) initial- and final-sound phoneme identity. Further explanation of how several of these domains were measured follows. Verbal development was measured with the Peabody Picture Vocabulary Test. Knowledge of book and print conventions was measured with the Concepts about Print Test. Sign identification was measured by asking children to identify common signs (i.e., Coca-Cola, McDonald’s, Stop, Taxi, Exit, Give Way). Rhyme recognition was measured by requiring the child to circle the picture that rhymed with the word presented by the examiner. Initial- and final-sound phoneme identity was measured by requiring the child to circle the picture that began or ended with the same sound as the word presented by the examiner.

Posttesting included readministration of the phoneme identity test, testing of knowledge of the sounds presented during training, and testing of a form of reading (word choice). This word choice posttest consisted of ten words, presented on cards and constructed of the letters introduced during training. When presented with a word on a card, the child was asked, “Does this card (e.g., ‘sat’) say ‘sat’ or ‘mat’?”
The results of this study revealed that the experimental group showed significant increases on phoneme identity scores from pretest to posttest as compared to the control group. This increase generalized to identifying four sounds that the children were not taught in training. Overall, both groups had an easier time identifying words that started with the same sounds compared to identifying final word sounds. Also, children trained with *Sound Foundations* received a higher mean score on the word choice posttest. These results show that *Sound Foundations* can be successful in teaching children phonological awareness skills. One major limitation of this study is that the intervention was conducted by the experimenters, rather than by classroom teachers or parents. Thus, the effectiveness of using *Sound Foundations* in applied settings such as the classroom or at home was unknown.

*Kindergarten follow-up.* In the kindergarten follow-up study (1993), 63 children from the original experimental group and 56 children from the original control group were tested at the end of their kindergarten year. These children were originally from four preschools and were now dispersed amongst 10 elementary schools. The children were administered six tests. Four of the tests, phoneme identify, phoneme elision, alphabet knowledge, and word identification, were administered to the children individually. The other two tests, pseudoword identification and spelling, were administered in small groups. On the phoneme identity test, the children were required to identify which of the pictures of objects began with the same sound as a target object. This task was repeated with ending sounds as well. Sounds included were only those the children were trained with in preschool. On the phoneme elision test, children were required to say a word with either the beginning or ending sound removed. There were
10 items requiring removal of initial sounds, 5 requiring removal of a single sound and 5 requiring removal of a cluster of sounds. This process was the same for the 10 ending sounds. The alphabet knowledge tests consisted of the same process used during the original study; children were shown cards and asked to point to the one that represented the targeted sound. Word identification was measured with the Word Identification subtest of the *Woodcock Reading Mastery Test – Revised*. On the subtest, the children read individual words until six errors were made in a row. On the pseudoword identification test, children were required to circle one word out of three possibilities that matched the pseudoword read to them. On the spelling test, children were required to spell ten words and four pseudowords.

Results revealed that children from the original experimental group were more proficient than children from the control group at pseudoword identification. Also, significant main effects were found favoring the experimental group on the phoneme identity test and on identifying words with the same ending sounds on the phoneme identity test. Disregarding group affiliation, the researchers examined the differences between the kindergarten students who passed and failed the phoneme identity task in preschool. Passing meant receiving a mean of 32 or more on the 48-item preschool phoneme identity task. This reclassification was done for two reasons: (a) Byrne and Fielding-Barnsley found that “it was immaterial whether children learned about phoneme identity from the program or from other sources” (p. 107); and (b) to answer the question, “Do children who enter elementary school understanding the principal of phoneme identity show an advantage in reading and spelling at the end of their first year of schooling?” (p. 107). All of the experimental group children passed the preschool
phoneme identity task while only 16 of the 62 control group children passed the task. The children classified as passers in preschool received higher scores on the kindergarten measures of word identification, pseudoword identification, spelling, initial phoneme identity, and final phoneme identity. Also, correlations revealed a relationship between preschool phoneme identity and kindergarten phonological awareness, pseudo word identification, and spelling of real and nonsense words. Although this study did not find entirely conclusive evidence that Sound Foundations had significant effects on the children’s literacy skills a year later, the results supported the idea that children who have early skill in phonological awareness are ahead of their peers in later years in a variety of reading skills.

First-grade follow-up. At follow-up at the end of first grade (1995), all 64 children from the experimental group and 54 children from the control group were tested again. Children were administered five tests measuring the following areas: (a) word identification (two lists with 20 words, one with regular words and one with irregular words), (b) spelling (contained 18 words of which six were regular, six were irregular, and six were pseudowords), (c) alphabet (required the children to write the letter dictated to them), (d) phoneme identity (20 items in which the child was asked to choose which of two words had the same initial sound as the word presented orally to them), and (e) rapid naming (required the child to name 30 digits arranged in rows of five as quickly as they could).

Results revealed that children originally trained with Sound Foundations showed greater pseudoword reading skills than did control group children. Also, although the
difference was not significant, the experimental group had higher mean scores on reading regular words.

As in the kindergarten follow-up study (1993), the students were reclassified as passers or failers based on their performance on the preschool phoneme identity task. The children identified as passers preschool (as described in the kindergarten follow-up study) performed better than failers when reading regular, irregular, and pseudowords.

Second-grade follow-up. At second-grade follow-up (1995), 62 children from the experimental group and 53 from the control group were again tested with seven computer-based tests. The tests required the children to name single-digit numbers in digit (e.g., 7) and written (e.g., ‘seven’) formats, to reading one and two syllable pseudowords, to read regular and irregular words of high frequency, to read two stories and answer 10 comprehension question for each story, and to identify recognized book titles from a list of 20 real book titles and 12 fake book titles. Upon examining the children’s mean scores on each test, it was found that the experimental group children were better able to read three-letter pseudowords, one and two syllable pseudowords, and irregular pseudowords. These children also had greater skills in reading uncommon, but phonetically regular words, as was determined by identifying the five least frequent words from the regular word list. The experimental group read more of these words correctly than the control group. Additionally, and perhaps most importantly, the experimental group performed better on the measure of reading comprehension. A multiple-regression analysis revealed that high levels of reading comprehension were related to high levels of both decoding and listening comprehension. There was no difference between the groups on the book title task. The experimenters concluded that
children trained with *Sound Foundations* in preschool showed significant gains in decoding skills and reading comprehension three years later.

**Third-grade follow-up.** The grade three study remains unpublished but is summarized briefly in Byrne’s book (1998). Participants included 57 children from the experimental group and 48 from the control group. Results revealed similar information as what was found in previous studies. The experimental group’s decoding skills (24.5 words out of 30), as measured by the nonword reading test, were better than the control group’s decoding skills (20.8 words out of 30). New information was also revealed in support of the “Matthew Effect.” When comparing preschool passing and failing groups (regardless of intervention received), the passing group received higher mean scores on the measure of print exposure than the failing group. As supported by other research (Good et al., 1998; Juel, 1988; Stanovich, 1986), children who start out as good readers read more later on in life.

**Fifth-grade follow-up.** In the final follow-up study (Byrne et al., 2000), 103 children (56 from the experimental group and 47 from the control group) that had originally participated in the 1991 study were reevaluated in fifth grade (mean age 11 years, 0 months). The children were administered a total of five reading tests. The first two tests were the Word Attack and Word Identification subtests of the *Woodcock Reading Mastery Tests – Revised*. Also, three reading lists, a 70-item spelling test (*South Australian Test of Written Spelling*), and a title recognition test were administered. The three reading lists consisted of 30 words each. One list was comprised of nonwords and the other two lists were comprised of regular words and irregular words. The title recognition test consisted of 25 book titles along with 15 pseudo-titles.
When the mean scores of all tests were compared, it was found that the experimental group’s mean scores were higher than the control group’s mean scores on the Word Attack test, on the irregular word list, and on a composite measure of all three word lists. Byrne at al. were also interested in examining the number of poor readers in both groups to demonstrate that early phonological awareness training prevents later reading problems. However, nine of the 56 experimental group children and 13 of the control group children demonstrated scores below the fifth percentile on all five reading subtests administered. This indicates that phonological awareness training in preschool cannot entirely prevent later reading problems in all children. When the nine low-performing students’ progress during preschool training with Sound Foundations was examined further, it was found that although these children were successfully taught to identify phonemes, the children were noted to be slower at gaining an understanding of the targeted phonemes. To explain this failure to prevent reading difficulty in some experimental group children, the hypothesis was developed that phoneme identification (on which Sound Foundations solely focuses) training is insufficient with some children. It was suggested by the authors, and supported by Murray (1998), that the addition of phoneme manipulation training (e.g., segmentation and blending) could increase effectiveness. It was also suggested that children that are slower at grasping and developing early reading concepts such as phonological awareness will be slower at grasping and developing later reading skills.

*Trial pre-school evaluation.* In order to evaluate the effectiveness of Sound Foundations when implemented by preschool teachers, Byrne and Fielding-Barnsley (1995) conducted a supplementary experiment. In this trial, three preschools containing a
total of 93 children agreed to use *Sound Foundations* in their classrooms. Teachers did not receive training but were asked to follow the program’s manual in whatever way was convenient for the individual school. All three schools covered all twelve phonemes taught in the program but at different paces (two school used 12 weeks and one used 6 weeks). Two schools did not instruct the children on identification of final sounds. All schools used the posters and worksheets but varied on the use of the card games.

Children were assessed pre- and post-test with measures of phoneme identity (see initial training study for a description). The preschool children’s performance in the new group was compared to the original experimental and control groups’ performance in the initial study (1991). For initial phoneme identity, the new group of preschoolers outperformed the original control condition. The original experimental group, however, outperformed the new preschool group for initial phoneme identity. In the one preschool that taught final-sound identification, these children’s final phoneme identity scores increased a mean of 5.83 points, while the children in the preschools that did not teach final sounds only earned a mean increase of 1 point. Ultimately, this study demonstrated that a low intensity intervention (i.e., no teacher training, large groups of children) resulted in some improvements in phonological awareness. One of the study’s limitations is that it is not clear what factors contributed to the difference between original experimental group’s scores and the new preschool group’s scores. Another limitation stems from the lack of control for pretest differences in the cohorts in the analyses used in the study.

*Parent implementation of Sound Foundations.* Currently, the *Sound Foundations* program is in another phase of testing (University of New England at Australia, 2003). The University of New England at Australia offered an open trial to parents of
preschoolers in which both their children and themselves would be enrolled in the study. What separates this current trial from the past clinical studies, however, is a focus on the sociocultural environment in which students learn to read. Byrne is now seeking to identify the impact that parental literacy level has upon the acquisition of literacy in their children. Byrne stated the following:

The more we can discover about why this is so, the better placed we’ll be to design effective reading instruction to help these children [and] we want to find out why reading skills tend to run in families, so we’re hoping to get in touch with families without any history of reading problems as well as ones where there have been such problems. (University of New England at Australia, 2003, para. 2-3)

This research process ties into the methods developed by the Sound Foundations authors in their studies, which demonstrated not only that students were able to acquire phonological awareness but also that they were more likely to acquire literacy if they were already exposed to word structures prior to involvement in the Sound Foundations program. While no information on the progress of this new study cycle have been publicly released as of the writing of this paper, it is highly likely that news regarding the next phase of Sound Foundations will emerge at some point in the near future.

Conclusions

The four phonological programs reviewed here differ on a variety of characteristics such as length of training, types of activities taught and what is measured, who can provide instruction, method of delivery (e.g., small groups, whole class, one-to-one), characteristics of participants, amount of research conducted, existence of long-term follow-up data, etc. Despite these differences, each program is supported by
evidence that the intervention can increase young learners’ phonological awareness skills. From the studies reviewed here, it appears that *Sound Foundations* has the most evidence of long-term effectiveness and is the only one attempted with parents thus far. However, like many of the programs, more research is needed on the use of these programs in applied settings such as in the classroom or in the home.

*Parent Involvement in Early Literacy Development*

Parents have a strong influence on children’s development of and interest in reading before their children ever enter school. Parents can utilize this influence to support specific skill development (e.g., letter name knowledge, letter sound knowledge, phonological awareness, reading fluency, reading comprehension, etc.) in addition to a general promotion of reading appreciation. This early skill development is crucial for children who are at-risk for future reading failure. Parents can and should be a part of the early intervention process. The following is a discussion and review of the literature concerning why parent involvement in literacy development is important and of specific parent-based reading interventions.

*Early Literacy Experiences and the Home Environment*

Given the impact of children’s early literacy skills on their future reading success, examining the types of literacy experiences children have before they enter school and during their early years of schooling is important. Research has found that the literacy experiences that children encounter at home influence their reading success at school (e.g., Christian, Morrison, & Bryant, 1998; Evans, Shaw, & Bell, 2000; Rush, 1999; Scarborough, Dobrich, & Hager, 1991; Smith & Dixon, 1995). For example, a study by Scarborough et al. (1991) revealed that children who were determined to be poor readers
in second grade interacted with books less frequently in their preschool years, according to maternal report, than children determined to be good readers in second grade. Poor readers also spent less time engaged in parent-child reading as preschoolers.

Christian et al. (1998) investigated, among other variables, the effects of the family literacy environment on 538 kindergarten children’s academic skills. Parents completed a measure that separated family literacy into the following components: (a) reading habits of the mother, (b) reading habits of the father, (c) who reads to the child and how often, (d) number of books the child owns, (e) how often someone in the family borrows books from the library, (f) amount of television watched, and (g) number of subscriptions to newspapers. It was found that the family literacy environment, as assessed by this measure, was associated with the children’s intelligence level and with their scores on measure of reading, receptive vocabulary, and knowledge for general information. In addition, it was found that, regardless of the family’s socioeconomic status or the mother’s educational level, children from families scoring high on family literacy environment scored higher on the academic measures than children from families who scored low on family literacy environment.

To elaborate on the interaction between literacy environment and economic status, Smith and Dixon (1995) studied the differences between 33 four-year-old children in Head Start preschool programs and 31 children enrolled in private preschools. The parents of the children completed a questionnaire inquiring about the quality of the home literacy environment. The children were assessed with nine different measures of literacy knowledge, including understanding the function of print, knowledge of literacy objects, ability to write words, identifying letter names and sounds, and ability to combine
syllable and phoneme segments into words. Overall, the findings suggest that those children who received the lowest scores were from families of low socioeconomic status.

It was also found that the middle-class parents engaged more frequently in literacy-promoting activities, such as reading to their child, than the lower-class parents. Hence, it seems that children from impoverished families are at a disadvantage because of the low quality of home literacy experiences. However, it is important to note that further examination of the middle-class children in the study who performed poorly on the assessment measures showed a trend of poor literacy experiences at home. Another interesting trend was found when examining the home literacy environments of the lower-class children who performed well. These children, despite poverty, were exposed to enriching home experiences. Therefore, as was found in the study by Christian et al. (1998), this study supports the idea that meaningful literacy experiences can override the detrimental effects of poverty.

Rush (1999) further examined Head Start children and their family environments by focusing only on low-income families. After assessing preschool children’s expressive and receptive vocabulary and their specific early literacy skills, measured by tasks of letter-naming fluency, onset recognition fluency, and phoneme blending, a great deal of variability was found among the children. Based on home observation and home literacy surveys completed by the parents, it was found that the children who performed the best had parents who engaged the children in conversation often, structured the children’s play, and reported high rates of literacy activities. Interestingly, the author of this study concluded by recommending the need for “the development of empirically
supported home-based interventions” (p. 12), particularly phonological awareness interventions.

Likewise, in a study by Evans et al. (2000), it was suggested that little research has been conducted on the effects of home reading experiences on phonological awareness skills. This study attempted to bridge this gap. Assessment of 67 five- and six-year-old children was conducted with measures of (a) frequency of reading children’s books (book title test); (b) frequency of reading activities at home (child interview); (c) intelligence (Wechsler Preschool and Primary Scales of Intelligence – Revised); (d) rapid naming; (e) phonological awareness (Test of Phonological Awareness – Kindergarten Version); (f) language (Peabody Picture Vocabulary Test – Revised); (g) letter knowledge; (h) literacy skills in first- and second-grade (the Word Identification, Word Attack, and Passage Comprehension subtests of the Woodcock Reading Mastery Tests – Revised); (i) first-grade spelling; and (j) second-grade spelling (Wide Range Achievement Test-3). The intelligence and rapid naming measures served as control variables. Interviews were conducted with the children’s parents on home literacy practices, and home visits were conducted each year in which a parent-child reading session was observed. It was determined that every day book reading did not predict letter name knowledge, letter sound knowledge, phonological sensitivity, or receptive vocabulary. However, these skills were predicted by parent report of specific literacy activities such as learning letter names and sounds. It was suggested that parents be trained so that they may help develop their children’s most important foundation reading skills.

The findings of the studies discussed in this review are notable because they demonstrate the importance of children’s exposure to literacy-related activities in the
home. Parents and the home literacy environment that they create can have a profound effect on their children’s literacy skills. The studies by Rush (1999) and Evans et al. (2000) address the idea that typical home literacy environments may not be sufficient for children who are at-risk for failing to learn to read. It is suggested that research-supported home activities, in addition to shared book reading, may be most beneficial.

_parent-based reading interventions_

The relationship between parents and children in respect to appropriate development of literacy has been well-documented. The end result in every source consulted for this literature review strongly suggests that the involvement of the parent in the child’s educational progress will improve the student’s reading performance. The home can be an excellent source of educational enrichment, and parents have the ability to enhance their children’s academic skills. With this knowledge, much research has studied parent-based reading interventions. The majority of these interventions have centered on nonspecific interventions, such as parent-child shared reading. However, an abundance of recent research suggests that parents can and should address more specific reading skills. The role of training parents in formal and specific home reading activities as compared to typical parent involvement has been clarified in a number of studies. Six studies were reviewed that are representative of the findings in the research on formal, structured, parent-based reading interventions.

Several studies have examined the use of specific error correction and praising procedures with parents attending to their children reading aloud. In a study by Wilks and Clarke (1988), 42 mother-child dyads were divided into three groups: a control group, an encouraged group, and a trained group. The control group parents completed
relevant questionnaires, and the children completed the pre- and post-test (*Neale Analysis of Reading Ability*, a norm-referenced measure of reading accuracy and comprehension).

The parents in the encouraged group were taught in two sessions about good reading habits and selecting appropriate books for their children. The parents in the trained group were presented with the same information as the encouraged parents, but were also taught in two additional sessions how to implement the use of praise and the correction of errors. They received ample time to practice these skills before using them at home. In examining the trained mothers, it was found that they changed their behaviors as a result of the training; they gave their child more praise and allowed their child more time for self-correction before providing correction. In examining the children’s scores, it was discovered that the trained group made significantly greater gains than the other two groups for reading comprehension. Keep in mind, however, that the only measure used to measure change in student performance in this study was a norm-referenced achievement test, which is not well-designed for measuring change over short periods of time.

Of the studies evaluating error correction procedures, several have employed multiple baseline designs. These studies have focused on employing parents to increase students’ reading fluency rate and to decrease the number of errors made while reading. In a study by Thurston and Dasta (1990), parents of eight children were trained to increase the use of praise, to use a specific correction procedure when the children made reading errors, and to ask comprehension questions after reading. A multiple baseline design was used to measure intervention effects. Children were assessed before and after baseline and before and after the parent-intervention. The measures used included the
Slosson Oral Reading Test, the reading comprehension and word recognition subtests of the Peabody Individual Achievement Test, a measure of oral reading rate, and a measure of percentage of words correct. It was found, by reviewing audiotapes of parent-child reading sessions, that parents did indeed change their behaviors as encouraged in the training session. Also, the children showed improvement on various reading measures as compared to a matched control group. Children reported enjoying reading with their parents more after the home intervention.

Another error correction procedure was evaluated by Duvall, Delquadri, Elliot, & Hall (1992). Multiple baseline, reversal, and pre-test/post-test comparison designs were used to evaluate effects. Four students who were experiencing difficulty in reading participated. Parents conducted tutoring during two treatment phases, separated by a second baseline during which tutoring was stopped. Parent tutoring consisted of instructing their child to read orally, intervening to correct errors, and providing systematic praise, as well as facilitating repeated readings of the passages for greater practice. Data were collected at home and at school to measure generalization of home-developed skills to school-related skills. Results indicated that the parent tutoring increased rates of correct reading (determined by analyzing the graphs of each student), the effects generalized to untutored passages at home, the effects generalized and maintained at school on tutored and untutored passages, and that the students evidenced gains as measured by grade-equivalent scores on a standardized, norm-referenced achievement test. This study’s results are limited by the use of grade-equivalent scores, which are not accurate in measuring student progress.
Love and Van Biervliet (1984) not only used a multiple baseline design but also analyzed the effects of an error correction procedure with students with mild mental handicaps (i.e., intellectual scores ranging from 60 to 70). Four students received training in which parents listened to the student read aloud, paused when the child made an error to allow time for self-correction, prompted a correct response after a ten-second delay period, and provided systematic praise. Children’s skills were evaluated by observing their oral reading at home and at school. The students’ number of words read correctly did not change much across phases, which the researchers hypothesized was due to the increasing difficulty level of the reading text over the course of the study. The students, however, did increase their rates of self-correction on untutored and tutored reading text during the training phase. Three of these students maintained improved self-correction rates during the maintenance phase.

Dialogic reading is another technique that has been used successfully with parents (e.g., Fielding-Barnsley & Purdie, 2003; Lonigan & Whitehurst, 1998). What is unique about dialogic reading is its emphasis on the parent’s active role and a focus on adding information to the reading session, such as by encouraging awareness of rhyme, concepts about print, or alphabetic knowledge. It is thought by some that a focus on a variety of reading skills is superior to a focus on just one. Fielding-Barnsley & Purdie (2003) trained the parents of 26 preschool children to implement an eight-week dialogic reading tutoring program. These students’ performance was compared to a control group consisting of 23 children. The students’ performance was evaluated during their first two weeks of kindergarten and then again at the end of their kindergarten year. Evaluation of the students measured receptive vocabulary, rhyme awareness, concepts about print,
recognition of initial consonant sounds, letter recognition, word identification (end of kindergarten only), and spelling (end of kindergarten only). After preschool parent tutoring at the beginning of their kindergarten year, the experimental group scored higher than the control group on measures of receptive vocabulary, initial consonant sounds recognition, rhyme awareness, and concepts about print. At the end of their kindergarten year, both groups improved in all areas, but the experimental group scored higher on the consonant sounds and concepts about print measures. What makes this study different than the others reviewed here is a focus on preschool intervention affecting later school performance. This study’s results are limited by the small sample size and by the fact that the parent participants were self-nominated (i.e., they were motivated and were enthusiastic about participating in the study) and may not be representative of all parents.

One recent study that has improved upon the design flaws of much parent-tutoring research (e.g., no random assignment, no control group, questionable use of norm-referenced achievement tests as measures of individual growth, etc.) was conducted by Powell-Smith et al. (2000). The researchers investigated two “home-based reading tutoring programs” designed to improve the students’ performance in reading achievement. Thirty-six students in the second grade and their parents were randomly assigned to one of three groups: literature-based home tutoring, curriculum-based home tutoring, and a control group. The parent tutoring procedures were the same for both treatment groups; however, what differed was the type of reading materials parents were taught to select. The literature-based program used age- and subject- appropriate reading materials in the form of children’s books, while the second program used basal readers from the school’s standard curriculum. The parents were supplied training and support in
delivering the program to their children, and tutoring sessions were applied four times each week for twenty minutes per session for five weeks. The effectiveness of the programs was evaluated through Curriculum-Based Measurement Reading (R-CBM) using probes from two sources, Tests of Reading Fluency (TORF) and the curriculum in which the student was being instructed. Data were collected for each student two times per week during baseline, treatment, and follow-up.

The results of the Powell-Smith et al. (2000) study were mixed: Neither of the programs showed marked overall progress (i.e., reading achievement level or reading achievement slope) for all students involved. However, when the researchers examined individual student graphs, it was discovered that students who were not responding to the regular school curriculum (as measured by baseline slope less than or equal to 1.0) improved more than students who were responding to the regular school curriculum. Additionally, students that received parent tutoring made more gains than the control group students.

The results of these studies provide support for the idea that parent training in reading activities results in benefits for children.

*Parent-Based Phonological Awareness Interventions*

Several researchers have raised the question of whether there are home experiences that are related to the development of phonological awareness (e.g., Evans et al., 2000; Rush, 1999; Senechal & LeFevre, 2002). The research in this area appears to be limited. Three studies have been identified that include a parent tutoring group focused on phonological awareness-based skills.
Although not specifically identified as a phonological awareness intervention, Gang and Poche’s study (1982) essentially taught parents to teach their children sounds, sound combinations, and sound blending with a highly structured approach. Three students and their mothers participated. Parent training was intensive. Six parent training sessions lasting two and one half hours each were conducted in which parents were taught about proper tutoring environments, provided a course on learning theory, given a quiz on the course, required to master pronunciation of all of the sounds of the program, reviewed the entire program manual, etc. The program used was called the Sound Symbols and Blending Program and consisted of six units, although the means by which lessons were taught were not explained in the study. Parents implemented the program four times per week for 25 minutes per session for seven weeks. A multiple baseline design was used. Two norm-referenced tests, an informal reading inventory, and criterion-referenced tests of letter sounds, letter combinations, and word blending were used to monitor student progress. All three students showed increased percentage of sounds pronounced correctly (as measured by the criterion-referenced tests) over the course of the study. Confidence in these results is weakened considered that there is no reliability or validity data reported for the criterion-referenced tests used. All three students also displayed increases on the norm-referenced measures.

A second program, highlighting phonics skills with a precision teaching approach, was examined by White, Solity, and Reeve (1984). Precision teaching involved daily probing, charting of data, setting targets, changing tasks, and selecting reading material at an appropriate level. Participants included thirteen children, seven of whom received intervention for twelve months and six of whom received intervention for less than
twelve months. There was no control group. Tutoring was conducted daily for 10 minutes per day. The skills taught by the parents included letter sounds, blending skills, initial and final blends, and discrimination skills. Measures included parent-administered daily probes and a standardized measure of reading achievement. Results indicated that the children showed gains in reading accuracy (as measured by the standardized achievement test). Based on results from the parent probes, all children showed gains for each skill covered from the beginning to the end of the program. Although the results are promising, the study design did not allow for controls of intervention effect (e.g., no control group or multiple replications). Thus, it is inconclusive as to what variable lead to the student’s gains (e.g., intervention effects, maturation, etc.)

More recently, Leach and Siddall (1990) compared the effects of four different parent-training groups on 40 first-grade students’ reading progress. One group of parents did not receive formal training, although implemented a Hearing Reading (HR) approach (having parents listen to their children read). A second group was trained in Paired Reading (PR), a shared reading method that teaches parents to monitor their child’s reading and at the same time teaches the child to choose books at the appropriate reading level. A third group was trained with Pause, Prompt, and Praise (PPP), the same error correction and praise method employed in the study by Thurston and Dasta (1990) described previously. The final group received training in Direct Instruction (DI), a program that focuses on teaching letter-sound identification, blending sounds, and rhyming (all phonological awareness skills). Parent training in DI was the most time-consuming of the methods studied. Training took four and a half hours. After ten weeks of the parent intervention (10-15-minute, daily sessions), results showed significant
effects in the PR and DI groups. Children in these groups improved in reading accuracy and comprehension. Although there was no difference between the PR and DI groups, this study provides one of the most recent attempts to show the outcome of a home-based phonics intervention.

Each of the studies discussed has provided initial evidence of the strength of parent-based phonological awareness interventions. More research with stronger designs, better measurement tools, and more cost-effective and less time-intensive treatments are needed to provide a clearer picture of the efficacy of this type of parent intervention.

Conclusions, Recommendations, and Statement of Purpose

The most noteworthy findings from a review of the literature on early literacy are as follows: (a) phonological awareness is a necessary component in the development of early literacy and is highly related to future reading success, (b) a variety of research-based phonological awareness interventions exist, (c) literacy activities conducted in the home affect children’s literacy development, and (d) parent-based literacy interventions are successful in improving children’s literacy skills. In reviewing the research, it is clear that there is a dearth of research on parent training in phonological awareness interventions. So far, limited research exists demonstrating the effectiveness of teaching phonological awareness in the home (e.g., Leach & Siddall, 1990). A concern with the existing studies is the intensive, time-consuming training procedures and/or expensive materials (Fitton & Gredler, 1996). The present study will focus on training parents with Sound Foundations (Byrne & Fielding-Barnsley, 1991), a less time-intensive and more cost-effective intervention program that can be easily adapted for parent use. Additionally, a measurement tool with supporting technical adequacy data that has been
designed to be sensitive to change over short periods of time will be used. Finally, the present study will attempt to add to past research by employing a single-case, multiple baseline design. The majority of research reviewed in this area employed group designs evaluated with quantitative statistics. While this type of design provides overall information on the effectiveness of interventions, it does not show outcomes of individual students over time. This study will use a multiple baseline design to demonstrate effects of the parent program on individual children.
Chapter Three

Method

This chapter defines the methods that were employed in conducting the present study. First, the participants, instruments, and design are described. Next, the procedures are discussed in detail. Specifically, the following topics are addressed in the description of procedures: participant recruitment and selection, screening, data collection, baseline, parent training, intervention, and follow-up. Lastly, data analysis procedures are presented and explained.

Participants

The participants in the study were three students at the end of their kindergarten year and one parent for each student (i.e., three parent-student dyads). Participants were selected from a kindergarten classroom in an elementary school in a large school district in southwest Florida. The children were identified by their teacher as typical students with a deficit in phonological awareness (PA). Students with identified learning disabilities, language impairments, or mental handicaps were not considered for participation. Recruitment and selection criteria are discussed in more detail later in this chapter. Parent participants were fluent speakers of the English language. Prior to selection of the participants, approval was obtained from the Institutional Review Board of the principal investigator’s university, from the participating school district, and from the principal of the selected school.
All students were selected from the same general education kindergarten classroom. The classroom teacher identified Houghton-Mifflin as the reading program used in the classroom. The teacher also indicated that this curriculum was supplemented with phonics activities.

Student 1 was a five-year old female student of Native American ethnicity. At the end of her kindergarten year, according to teacher report, she was recommended for retention. She never received exceptional student education services. Her mother, who served as the parent participant, fell within the 25-35 year old age range and was of Native American descent. Student 1’s mother identified herself as a homemaker who completed graduate or professional school.

Student 2 was a six-year-old male student identified as Non-Hispanic White. According to teacher report, Student 2 made slow progress in reading throughout most of his kindergarten year but started to make greater gains in reading towards the end of the school year. He was recommended for promotion to first grade. He never received exceptional student education services. Student 2’s mother served as the parent participant. She was of Non-Hispanic White descent, fell within the 35-44 year old age range, completed a four-year college degree, and worked full time as an insurance agent.

Student 3 was a six-year-old female student of Non-Hispanic White descent. According to teacher and parent report, Student 3 received speech therapy resource services at school since the beginning of her kindergarten year due to articulation difficulties. Although her teacher recommended her for retention, Student 3 was going to continue on to first grade at her mother’s request. Student 3’s parent participant was her mother. Student 3’s mother was of Non-Hispanic White descent, fell within the 45-54
year old age range, completed a high school degree, and worked full-time as a sales associate at a major retail store.

Instruments

*Independent Variable*

In this study, the independent variable was the parent reading intervention. A variety of PA interventions exist; however, *Sound Foundations* (Byrne & Fielding-Barnsley, 1991) was chosen because of extensive evaluation of its effectiveness and ease of adaptability for parent use. *Sound Foundations* emphasizes recognizing phonemes across words, such as by pointing out two words that start or end with the same sounds. The phonemes that receive the most attention during the course of the intervention are the continuant consonant sounds (i.e., sounds made while air continues to flow out of the mouth) /s/, /l/, and /sh/; the stop sounds (i.e., sounds made while airflow from the lungs is completely stopped) /m/, /p/, /t/, and /g/; and the vowel sounds /e/ (as in bet) and /æ/ (as in bat). The rationale behind the program’s focus on a small subset of phonemes originates from initial evidence that once initial PA is developed for some phonemes, the awareness will generalize to other phonemes not specifically taught (Byrne & Fielding-Barnsley, 1991).

The materials of *Sound Foundations* include a cassette tape with poems and stories, posters requiring the child to point to pictures of objects displaying the desired sounds, worksheets requiring the student to locate and color in objects displaying desired sounds, and two card games that allow the children to apply their knowledge. There are two posters for each of the seven consonants, one with pictures of words that have the consonant as the beginning sound and one with pictures of words that have the consonant
as the ending sound. Only one poster is for each vowel, showing pictures of words that have the vowel as the beginning sound. Three worksheets are provided for each of the phonemes targeted in this program and for the remaining phonemes represented in the main letters of the alphabet. The card games, typically used at the end of the program, focus on the sounds /s/, /p/, /t/, and /l/. One game is a form of dominos, and the other is a card game played with the same rules as the game “Snap.” In Byrne and Fielding-Barnsley’s (1991) first evaluation of Sound Foundations, each training session focused on one sound in one position (e.g., the first session taught /s/ as a beginning sound while the next session focused on /s/ as an ending sound). Each session began with a song or jingle using the phoneme, then used the poster for the sound, and finally used the worksheets. The card games were introduced in the last training session. In this study, parents were trained to use the materials in the same order.

**Dependent Variable**

The dependent variable was the students’ phonological awareness as measured by the DIBELS (Dynamic Indicators of Basic Early Literacy Skills). The DIBELS are standardized and individually administered measures of early literacy skills, including phonological awareness, the alphabetic principle, and accuracy and fluency in reading text. For this study, the DIBELS was preferable to other standardized measures of PA because it is sensitive to changes in students’ skills over short periods of time, can be used to monitor the effects of an intervention, is easy to administer, and is time efficient and cost effective (Good, Simmons, & Smith, 1998; Kaminski & Good, 1998). The Phoneme Segmentation Fluency (PSF) measure of the DIBELS was used in this study.
Phoneme Segmentation Fluency (PSF) is a PA measure that requires students to segment fluently a spoken word (of either three or four sound segments) into individual phonemes. For example, if the spoken word was “dog,” the student would say the sounds /d/ /o/ /g/. The student receives credit for each correct sound segment provided. The final score is the total number of phonemes provided in one minute. The PSF measure takes approximately two minutes to administer. PSF has over 20 alternate forms for use in progress monitoring. Initial evidence shows that a single PSF probe has a reliability of .88 and the average of three probes has a reliability of .96 (based on a Spearman-Brown prophecy formula). One-year predictive validity with reading criterion measures ranges from .73 to .91 (Kaminski & Good, 1998). Alternate-form reliability for kindergarten students over two weeks is .88 (Kaminski & Good, 1996) and alternate-form reliability over one-month is .79 (Good et al., 2003). Concurrent, criterion-related validity of PSF with the readiness cluster of the Woodcock-Johnson Psycho-Educational Battery is .54 (in spring of kindergarten) (Good et al., 2003).

Social Validity Measures

Parent satisfaction with the intervention was measured using a parent social validity scale based on the Intervention Rating Profile (IRP-15) (Witt & Martens, 1983). Although developed for teacher use, the IRP-15 was adapted for parent use. For example, an item stating, “I would suggest the use of this intervention to other teachers” was changed to, “I would suggest the use of this intervention to other parents.” The parent social validity scale contained 12 items rated on a 6-point Likert-type scale from “strongly disagree” to “strongly agree.” A sample parent social validity scale can be found in Appendix A. Children’s perceptions of the intervention were measured using a
child social validity scale based on the Children’s Intervention Rating Profile (CIRP). The child social validity scale contained six items on a 3-point scale. The children were shown a card containing picture cues of three faces: one happy face (3 points), one neutral face (2 points), and one sad face (1 point). The child was asked to point to the picture that represented their response to each item. The children’s scale was read to each child by the investigator. A sample child social validity scale can be found in Appendix B.

Design

A multiple baseline across subjects design was used in this study. All parent-student dyads began baseline at the same time. The participation of three parent-student dyads allowed for three baselines. A minimum of three baselines is generally recommended (Barlow & Hersen, 1973; Barlow & Hersen, 1984; Kazdin, 1982). Data collection throughout all phases consisted of monitoring progress with the DIBELS PSF measure. Once all baselines were stable, one parent-student dyad was selected to begin the intervention phase. Stability decisions were made based on a visual analysis of the data points by the primary investigator and a graduate professor in the School Psychology Program at the primary investigator’s university. Typically, stable performance “is characterized by the absence of trend (slope) in the data and only slight or moderate variability in performance” (Kazdin, 1978, p. 630). Academic data do not always conform to this typical trend, however. Thus, the decision criterion was defined by slight or moderate variability. If this decision criterion was not met after two weeks of data collection (i.e., six data points), one parent-student dyad was selected to begin the
intervention phase. Kazdin (1982) reports minimum guidelines for the duration of phases ranging from three data points to five. Six data points are more than sufficient.

Baseline data were collected on the remaining two parent-student dyads after the first dyad began intervention. The investigator expected to see changes in the data collected (e.g., increasing scores on the DIBELS PSF measure) for the dyad beginning intervention, while the baselines of the remaining pairs remained stable (i.e., slight or moderate variability). This pattern would suggest that changes occurring with the first dyad were influenced by the intervention because the first dyad was the only one exposed to the intervention and the only one evidencing change. Once the first dyad began to show effects of the intervention, the next dyad with the least variability in baseline data was selected to begin intervention. Intervention effects were defined by a variety of factors including evidence of an increasing baseline trend, evidence of a small amount of variability in the data, and the presence of nonoverlapping data points (e.g., data points in the intervention phase higher than data points in the baseline phase). This same procedure was used in determining when the third dyad began intervention. If any dyad did not show clear intervention effects, the following guideline was used: the next dyad would begin intervention two weeks after the previous dyad.

The multiple baseline design was chosen for a variety of reasons. The multiple baseline design is stronger than a simple A-B design because it reduces threats to internal validity (Barlow, Hayes, & Nelson, 1984). The threats to internal validity include history threat (something other than the implemented intervention caused the outcome), maturation threat (the outcome would have been the same even if the participants had not received the intervention due to normal maturational growth), testing threat (taking the
pre-test affects how participants perform on the post-test), and instrumentation threat (changes in performance due to changes in the test). The multiple baseline design allows for more control than an A-B design, thus reducing internal validity threats, because it uses each baseline as a control for the earlier baseline. Each time a behavior changes as a result of intervention while the behavior of participants not exposed to intervention does not change, confidence in the intervention’s effect is increased (Cooper, Heron, & Heward, 1987). The multiple baseline design is weaker than a reversal design (e.g., the A-B-A design) because the effects of intervention on each of the subjects are not directly demonstrated but inferred from the untreated participants (Barlow & Hersen, 1984). However, the multiple baseline design, compared with the reversal design, is most appropriate for this study because the target behavior, phonological awareness, is irreversible and cannot be returned to baseline. Once developed and improved, PA skills cannot be removed from the participants.

Procedures

Participant Recruitment and Selection

Once approval was obtained from the necessary sources, the principal at the selected school identified a kindergarten teacher willing to assist in selection of student participants. This kindergarten teacher at the selected school identified three students who were pre-readers, who showed delayed development of literacy skills, and who had parents interested in helping their children at home. Once this step was completed, letters to the parents of the teacher-identified children were sent home. The letter specified that their child was identified to be screened for a parent-child reading intervention, requested parental consent for their child to be screened, and surveyed interest in participating in
the intervention program. The letter explained the screening process and that not all students will be chosen to participate in the program, based on screening results. The letter and parent consent for screening are found in Appendix C. A discussion of the screening procedures is presented later in this chapter.

Parents of all three students originally identified by the kindergarten teacher returned the screening consent form, provided permission for screening, and indicated interest in possible participation. These three students were screened and identified as having PA deficits. Once the three students were identified and screened, the examiner met with each parent and student together to describe the program in detail and to obtain informed consent from the parent. The informed consent form can be found in Appendix D. All three parents provided informed consent to participate in the study.

Screening

As part of the screening for participants, students were administered DIBELS PSF probes to identify PA deficits. The PSF measure is the recommended PA assessment tool at the end of kindergarten according the kindergarten DIBELS benchmark goals. These kindergarten DIBELS benchmark goals indicate that at the end of the school year students receiving scores of less than 10 points on the PSF measure have a deficit in PA skills. Students receiving scores between 10 and 35 point have emerging PA, and students receiving scores of 35 and above have established PA (Good, Simmons, Kame’enui, Kaminski, & Wallin, 2002). Three PSF probes were administered and a median score was calculated to represent each student’s final screening score. Students scoring lower than 10 phonemes correct per minute on PSF were considered to have PA deficits. Each student that was originally identified by the kindergarten teacher fell
within the deficit range. Student 1 received a median score of 9 phonemes correct per minute. Student 2 also received a median score of 9 phonemes correct per minute. Student 3 received a median score of 5 phonemes correct per minute.

Data Collection

The primary investigator administered the DIBELS. The primary investigator was trained in DIBELS administration and scoring during a graduate level assessment course in the School Psychology Program at the primary investigator’s university and again during a training session for school psychologists and school reading specialists. Before beginning data collection, the primary investigator checked accuracy of PSF administration with a colleague who also was trained in DIBELS administration. The investigator was required to meet a criterion of at least 90% interobserver agreement before beginning data collection. The primary investigator administered three DIBELS PSF probes to a kindergarten student (not one of the participants in this study) while the colleague observed and scored. After this administration, the primary investigator and the colleague compared PSF protocols and calculated interobserver agreement. The percent of agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements; this quotient was then by multiplied by 100. The criterion of at least 90% agreement was met on all three PSF probes administered. The agreement percentages for the PSF probes administered were 90%, 95%, and 100%, in order of administration.

For each student, data collection occurred at the child’s home. Data collection occurred at a time that was convenient for the family and the primary investigator. The data collection occurred on a fairly regular schedule for each student. Data collection
occurred for Students 1 and 3 on Mondays, Wednesdays, and Fridays. Data collection for Student 2 occurred on Tuesdays, Thursdays, and Saturdays. This schedule occasionally shifted based upon changes in plans (e.g., family or investigator not available on one of the set days), which occurred once with the schedules of Students 1 and 2 and twice with the schedule of Student 3.

*Baseline*

All three students received baseline evaluation using one PSF probe from the DIBELS each time. Baseline data were collected for each student three times per week with one probe each time.

*Parent Training*

Once baseline was completed, parents were instructed in the implementation of *Sound Foundations*. Training occurred during a one-hour training session. The primary investigator completed the parent training. Because of the staggered intervention phases, each parent was trained individually. An agenda outlining the parent instruction session can be found in Appendix E. During the training session, each component of the *Sound Foundations* program (audio tape, poster, worksheets) was reviewed, followed by role-playing. The primary investigator modeled the use of each program component. The parents then had the opportunity to practice implementing each program activity and received immediate feedback from the primary investigator. Role-playing included practice with both the materials covering phonemes in beginning positions of words and the materials covering phonemes in ending positions of words. After role-playing, the intervention schedule and the treatment integrity checklists were reviewed. Next, parents were given an opportunity to ask questions. Finally, the investigator and parent
scheduled a time for the first-week follow-up phone call as well as times for progress monitoring data collection with the students. Parents were given all materials that they needed throughout the course of the intervention, and parent and student demographic data were collected (see Appendix F).

**Intervention**

Intervention implementation with the parent-implemented *Sound Foundations* program was staggered amongst the three parent-student dyads. The decision criterion was considered and the first dyad was selected to begin intervention after two weeks. Intervention was not started for the first dyad before the two-week time frame because the third student’s baseline data showed an increasing trend and appeared variable. The second dyad began intervention two weeks later, after the first dyad began to show intervention effects. Clear intervention effects were not apparent with the second student immediately, so the final dyad began intervention two weeks after the second dyad began intervention. Data collection with the DIBELS occurred two times per week during the intervention phase with one PSF probe each time.

The parent reading intervention was a five and a half week program that was implemented by the parent with their child twice per week. The program was designed to occur during the students’ summer vacation between school years. Due to these time constraints, the full *Sound Foundations* program was shortened in the same way that the program developers did in their research (Byrne & Fielding-Barnsley, 1991). Only five consonant sounds (/s/, /m/, /t/, /l/, and /p/) and one vowel sound (/æ/) were taught during the parent intervention. The card games were not used because they required a group of at least four students who completed the program to play. The parents were able to
choose which days of the week to implement the intervention. The only specification was that they should leave one non-intervention day between days of intervention (e.g., if the program was implemented on Monday, the parent should wait until at least Wednesday before implementing the program again). A general schedule was set for the course of the intervention (see Appendix G). Day one of week one focused on the phoneme /s/ as a beginning sound. Day two of week one focused on the phoneme /s/ as an ending sound. Weeks two through five concentrated on the remaining phonemes (/m/, /t/, /l/, and /p/) with the first training day of the week focused on the sound in the beginning position of words and the second training day of the week focused on the sound in the ending position of words. The last week introduced the vowel sound /æ/ in the beginning position of words.

Each intervention session was implemented in the same way that Byrne and Fielding-Barnsley (1991) implemented the program in their first evaluation of *Sound Foundations*. The session began with the parent and child listening to the corresponding poems and stories on the *Sound Foundations* cassette tape, then moved into the use of the corresponding poster, and finally ended with the use of the three corresponding worksheets. When completing the poster activity, the parent asked the child to look for things in the poster that started or ended with the specified phoneme. When the child ran out of words, the parent pointed to the ones they missed and asked the child to name the picture. Once the poster activity was completed, the parent then introduced the three worksheets. The first worksheet type has a picture of one of the objects from the poster in a box, then four more pictures. The object of the first worksheet was for the children to color the pictures that had the same beginning or ending sound as the picture in the
box. The second worksheet type has nine pictures, three rows of three pictures. The object of the second worksheet was to find three pictures with the same beginning or ending sound, all in a row, column, or across the diagonal. The third worksheet type is a smaller version of the poster in which the children colored in the objects with the same beginning or ending sound.

_Procedural integrity._ Two measures were used to ensure treatment integrity. First, parents had a checklist on which to record intervention activities completed. The checklist required the parent to record the following information after each intervention session: date, time intervention activities began and ended, the intervention activities completed, and how well the session went. A space was provided for the parents to specify any questions they might have. The parents provided the investigator with the checklists each time the investigator met with the child/parent for data collection. A sample checklist can be found in Appendix H. Additionally, parents were called after the first and third weeks of intervention to evaluate intervention implementation. During these telephone calls, a telephone checklist was completed and any parent concerns or questions were addressed. A sample telephone checklist can be found in Appendix I.

_Follow-up Phase_

Once the final intervention session was completed, the students were evaluated the week following intervention withdrawal. Maintenance effects were evaluated with the collection of DIBELS PSF data three times per week for one week with one probe each time. Additionally, parents and students completed the social validity measures during this time. The children’s rating scale was read to them by the primary investigator.
Data Analysis

Data were analyzed from the DIBELS assessment information. DIBELS assessment data were displayed graphically for each student to show performance during baseline, Sound Foundations parent intervention, and follow-up (see Figure 1). The graphs consist of phonemes per minute on the y-axis and days on the x-axis. Vertical lines are used to separate the baseline, intervention, and follow-up phases. Analysis of the graphs involved visual inspection of the graphic display. According to Kazdin (1982), visual inspection is the typical means of data evaluation in single-case research while statistical analysis is used less frequently (Polaha & Allen, 1999). The investigator examined the graphs to determine if the performance level for each student changed after introduction of the intervention and if effects of the intervention were maintained after it was withdrawn.

In visual inspection, the most important characteristics of data assessment are the magnitude of change and the rate of change (Kazdin, 1982). Magnitude of change is measured by determining changes in mean across phases and changes in level. The mean level of performance for each student in each phase was calculated. Changes in level across phases also were examined. A change in level refers to “the shift or discontinuity of performance from the end of one phase to the beginning or the next phase” (Kazdin, 1982, p. 234). It is important to note that in studies of academic skills, sudden changes between levels may not occur. For this reason, an alternative definition of level was used. The median of the data points from the last week of the baseline phase (i.e., last three data points) was compared to the mean of the data points from the last week of the intervention phase (i.e., last two data points). Additionally, the mean of the last two data
points from the last week of the intervention phase (i.e., last two data points) was compared to the median of the three data points from the follow-up phase.

The rate of change is measured by changes in trend and the latency of the change. Systematic increases or decreases in the data over time indicate changes in trend or slope. The trend of the data was examined in each phase to determine if the parent reading intervention resulted in systematic increases in PA. Trends were calculated on Microsoft Excel using linear regression. The calculated slopes reflect the daily progress of the participants in each phase. The investigator expected systematic increases after the intervention phase and stability or possible increases after the follow-up phase. Latency of change refers to how quickly change occurs after a phase change, with a change occurring more quickly indicating clearer intervention effects. Latency of change was inspected between the baseline and intervention phases.

In addition to magnitude and rate of change, analysis of variability in each phase was examined and the percentage of nonoverlapping data points between phases was calculated. When data points between phases are nonoverlapping, the effects of the intervention are stronger than when there is a high amount of overlap between data points.

Although the study design calls for stable baselines, it is important to note that academic performance data are rarely completely stable, in particular when classroom instruction is occurring. In fact, due to the nature of academic variables, it was expected that baselines would show an increasing trend. Data analysis is more difficult if performance is improving during baseline; however, Kazdin (1982) suggests that baseline
trends rarely hinder the ability to determine intervention effects in multiple baseline designs when there are strong effects.

Finally, the social validity data gathered from the parents and children were examined qualitatively and were not subjected to statistical analysis.
Chapter Four

Results

The following chapter includes a discussion of the multiple baseline phonological awareness data for the three student participants, a summary of the intervention implementation integrity, and a summary of the social validity outcomes. Specifically, this chapter will present the multiple baseline data relative to the research hypothesis through visual presentation, visual analysis, and written discussion.

Participants’ Phonological Awareness Development

The results were analyzed visually and are presented with regard to the following research hypothesis: Students receiving Sound Foundations training implemented by their parents will show an increase in phonological awareness skills, as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), compared to baseline scores on these measures.

Figure 1 provides a graphic display of phonemes correct per minute on the DIBELS Phoneme Segmentation Fluency (PSF) measure for each student participant across baseline, intervention, and follow-up phases. The results illustrated in the figure are discussed in more detail in the following sections.
Figure 1.
Phonemes Correct Per Minute Across Participants
**Student 1.** Student 1 displayed a slightly increasing baseline trend of phonemes per minute (PPM), with an increasing intervention trend as well, and a decreasing follow-up trend (see Figure 1). Descriptive statistics summarizing the variability of data points and the mean level of performance in each phase (i.e., baseline, intervention, and follow-up) for Student 1 are presented in Table 1. The standard deviation and range of data indicated a relatively small amount of variability during the baseline phase. The data collected during the intervention and follow-up phases were slightly more variable.

When comparing baseline to intervention, the mean level of PPM for Student 1 increased in the intervention phase as compared to the baseline phase. Student 1 achieved a baseline mean of 16 PPM, which increased to an intervention mean of 25 PPM. This is an increase in mean data of 9 PPM from baseline to intervention phase. Additionally, from the last week of the baseline phase (median of last three data points: 16 PPM) to the last week of the intervention phase (mean of last two data points: 28.5 PPM), there was a change in level of 12.5 PPM. Calculations of level changes across conditions appear in Table 2.

When comparing the mean level of performance between intervention and follow-up, the mean level of PPM for Student 1 increased in the follow-up phase as compared to the intervention phase. Student 1 achieved a follow-up mean of 26 PPM, which is an increase of 1 PPM over the intervention phase. However, from the last week of the intervention phase (mean of last two data points: 28.5) to the follow-up phase (median of three data points: 26), there was a change in level in the negative direction of 2.5 PPM.

An analysis of the latency of change in performance suggests that no clear improvement occurred at the time the intervention was introduced, but that shortly
thereafter, greater increases became evident. The first data point upon implementation of
the intervention was not significantly greater than the data points collected during
baseline. However, the next several data points were above baseline data points.

Table 1.
Descriptive Statistics for Phonemes Per Minute for Student 1

<table>
<thead>
<tr>
<th>Condition</th>
<th>X</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>16</td>
<td>1</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Intervention</td>
<td>25</td>
<td>3</td>
<td>17</td>
<td>29</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>26</td>
<td>2</td>
<td>25</td>
<td>28</td>
</tr>
</tbody>
</table>

Trendlines are shown in Figure 1 as dotted lines in each phase. The slope of each
trendline and calculations of change in slope are depicted in Table 2. The slope reflects
the daily progress of Student 1 in each phase. The trend of the data of Student 1 was
increasing during both the baseline phase (slope = 0.05) and intervention phase (slope =
0.19). The trend during the intervention phase was steeper than the trend during the
baseline phase. Specifically, the change in slope from baseline to intervention was 0.14.
A decreasing trend was observed during the follow-up phase (slope = -0.26). The change
in slope from intervention to follow-up was -0.45.

Table 2.
Slope and Level Change for Phonemes Per Minute for Student 1

<table>
<thead>
<tr>
<th>Condition</th>
<th>Slope</th>
<th>Change in Slope</th>
<th>Level</th>
<th>Change in Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0.05</td>
<td>0.14</td>
<td>16 (@ last week)</td>
<td>12.5</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.19</td>
<td></td>
<td>28.5 (@ last week)</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td>-0.45</td>
<td>28.5 (@ last week)</td>
<td>-2.5</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>-0.26</td>
<td></td>
<td>26 (@ last week)</td>
<td></td>
</tr>
</tbody>
</table>

For Student 1, the percentage of nonoverlapping data points between the
intervention and baseline phases was 91%. The only data point in the intervention phase
that overlapped was the first data point collected during the first week of intervention.
All data points collected during follow-up overlapped with the intervention phase data points.

*Student 2.* Student 2 displayed a slightly decreasing baseline trend, a slightly increasing intervention trend, and a stable follow-up trend (see Figure 1). Descriptive statistics summarizing the mean level of performance and variability in each phase for Student 2 are presented in Table 3. A small amount of variability is present in the data collected during the baseline phase. The intervention phase demonstrates more variability in the data. The follow-up data indicated an absence of variability in the data (all data points collected were the same).

Student 2’s mean improved 3 PPM from a baseline level of 11 PPM to an intervention level of 14 PPM. Additionally, Student 2 displayed a change of level of 6.5 PPM from the last week of baseline data collection to the last week of intervention data collection. Calculations of level changes across conditions appear in Table 4.

Student 2’s mean level of performance during follow-up (16 PPM) was higher than the mean level of performance during intervention (14 PPM) by 2 PPM. However, there was a change in level in the negative direction (-0.5) when comparing the mean of the last two data points from the intervention phase (i.e., the last week of intervention) with the median of the three data points from the follow-up phase.

An analysis of the latency of change in performance indicates no immediate improvement after the introduction of the intervention.
Trendlines are shown in Figure 1 as dotted lines in each phase. The slope of each trendline and calculations of change in slope for Student 2 are depicted in Table 4. The slope reflects the daily progress of Student 2 in each phase. Prior to the implementation of the parent intervention, the trend of the data for Student 2 was decreasing (slope = -0.03). The direction of Student 2’s performance changed after implementation of the parent intervention. Specifically, Student 2’s measured levels of PPM slightly but steadily increased across the intervention phase (slope = 0.13). From baseline to intervention, this represented an increase of 0.16 in Student 2’s slope. A stable trend was observed during the follow-up period (slope = 0).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Slope</th>
<th>Change in Slope</th>
<th>Level</th>
<th>Change in Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>-0.03</td>
<td>0.16</td>
<td>10 (@ last week)</td>
<td>6.5</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.13</td>
<td></td>
<td>16.5 (@ last week)</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>0.13</td>
<td>-0.13</td>
<td>16.5 (@ last week)</td>
<td>-0.5</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>0</td>
<td></td>
<td>16 (@ last week)</td>
<td></td>
</tr>
</tbody>
</table>

For Student 2, the percentage of nonoverlapping data points between the intervention and baseline phases was 55%. All nonoverlapping data points occurred from the middle to the end of the intervention phase, corresponding to the third through sixth weeks of intervention. All data points collected during follow-up overlapped with the intervention phase data points.
**Student 3.** Student 3 displayed slightly increasing baseline and intervention trends and a stable follow-up trend. Descriptive statistics summarizing the mean level of performance and variability in each phase for Student 3 are presented in Table 5. The standard deviation and range of data indicated a high amount of variability during the baseline and intervention phases. Student 3’s data was more variable than the data collected for both Student 1 and 2. This variability influenced the decision to delay intervention implementation for Student 3. The data collected during follow-up phase appears less variable than the baseline and intervention phases.

Student 3’s mean level of PPM increased from 12 PPM to 16 PPM from baseline to intervention. Additionally, Student 3 demonstrated a change in level of 3 PPM from the last week of baseline to the last week of intervention. Student 3 showed a mean increase in PPM from intervention (mean of 16 PPM) to follow-up (mean of 18 PPM). However, an analysis of the change in level does not indicate an increase in performance from the last week of intervention to follow-up. Calculations of level changes across conditions appear in Table 6.

An analysis of the latency of change for Student 3 was difficult due to the variability in the data. There did not appear to be immediate improvement when considering the first two data points after the start of the intervention phase. Greater change was evident with the third and fourth data points after the start of the intervention phase; however, this increase in performance was not maintained (i.e., the third and fourth data points are then followed by a dip in PPM).
Table 5.
Descriptive Statistics for Phonemes Per Minute for Student 3

<table>
<thead>
<tr>
<th>Condition</th>
<th>X</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>12</td>
<td>3</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>Intervention</td>
<td>16</td>
<td>3</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>18</td>
<td>1</td>
<td>17</td>
<td>19</td>
</tr>
</tbody>
</table>

Trendlines are shown in Figure 1 as dotted lines in each phase. The slope of each trendline and calculations of change in slope for Student 3 are depicted in Table 6. The slope reflects the daily progress of Student 3 in each phase. Prior to the implementation of the parent intervention, the trend of the data for Student 2 was increasing slightly (slope = 0.07). Despite the increasing trend and variability in the data, the intervention was implemented due to time constraints. After intervention implementation, the trend of PPM continued to increase (slope = 0.11). The intervention slope was greater to some extent than the baseline slope (change in slope = 0.04). A stable trend was observed during the follow-up period (slope = 0).

Table 6.
Slope and Level Change for Phonemes Per Minute for Student 3

<table>
<thead>
<tr>
<th>Condition</th>
<th>Slope</th>
<th>Change in Slope</th>
<th>Level</th>
<th>Change in Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0.07</td>
<td>0.04</td>
<td>14 (@ last week)</td>
<td>3</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.11</td>
<td>-0.11</td>
<td>17 (@ last week)</td>
<td>0</td>
</tr>
<tr>
<td>Follow-Up</td>
<td>0</td>
<td>-0.11</td>
<td>17 (@ last week)</td>
<td>0</td>
</tr>
</tbody>
</table>

For student 3, the percentage of nonoverlapping data points between the intervention and baseline phases was low, falling at 36%. The pattern of nonoverlapping data points was not as regular as the patterns for Student 1 and 2. Nonoverlapping data points occurred at irregular intervals throughout the intervention phase. All data points collected during follow-up overlapped with the intervention phase data points.
**Treatment Integrity**

Intervention implementation integrity was examined using an intervention activities checklist that parents completed after each intervention session and a telephone checklist that the investigator completed on the phone with each parent after the first and third weeks of intervention.

All parents completed an intervention activities checklist after each intervention session. Each component of the checklist was not fully completed each time, however. The sections of the form that often were left incomplete were the ending time of the session and the beginning and ending times of the individual activities (i.e., cassette tape, poster activity, worksheets). Eleven intervention activities checklists were completed by each parent, for a total of 33 checklists across all three parents. The ending time of the session was left incomplete on 24% of the checklists. Beginning and ending times of the individual activities were left incomplete on 46% of the checklists. This likely occurred due to the parents focusing on the implementation of the intervention activities and not concentrating as much attention on the specific time span of each activity.

The intervention activities checklist also contained a space for parents to indicate their impressions of the intervention session. This space was completed on 5% of the checklists. Parents wrote general comments like, “I think it went well.” In addition, none of the parents wrote down questions in the space provided on the forms; although, this was likely due to the great amount of time the investigator spent at the homes of each family (for progress monitoring), allowing for any questions to be addressed in person. Parents asked the investigator questions mostly regarding the appropriateness of the procedures they were using. For example, the parents showed the investigator the
completed materials (e.g., posters and worksheets) from previous sessions to ensure they were completing the activities as required.

Overall, the intervention activities checklists completed demonstrated that each parent completed all required components of *Sound Foundations* during each intervention session. The checklists showed that the parents focused on each required sound in both the initial and final positions of words, as the intervention schedule required. Additionally, the checklists showed that the intervention was completed twice per week and that at least one non-intervention day was left between intervention days, as specified in the procedures of this study.

Providing additional confidence in the internal validity of this study, the telephone checklists at the first and third weeks of intervention revealed few concerns and that the parent participants were generally pleased with the intervention process. At the first week follow-up phone call, the parent of Student 3 inquired about her older children being able to help out with the implementation of the intervention. The investigator reminded this parent of the goal of the research study, specifically that during the course of the study parent implementation was required. Other than this concern, at both the first and third weeks of follow-up, each parent provided information supporting appropriate intervention implementation, and none of the parents required or requested a follow-up training session.

Based on the available information (considering that parents did not always provide time-based information), the intervention session length ranged from 25 to 35 minutes. The average length of time of the cassette tape activity was 5 minutes. The
average length of time of the poster activity was 10 minutes. The average length of time to complete all three worksheets was 15 minutes.

**Social Validity**

To examine the participants’ perceptions and acceptability of the *Sound Foundations* parent intervention, each student in this study answered six questions about the intervention and its effects. A description of the Child Social Validity Scale and its administration can be found in Chapter Three. Student responses to this rating scale were examined qualitatively and are discussed here narratively. All three students pointed to the happy face when presented with the questions regarding the reading program being good (Question 1), liking the reading program (Questions 5), thinking the reading program will help them do better in school (Question 6), and indicated the reading program would be good for other children (Question 4). Student’s 1 and 2 did not endorse the item indicating that their parent was too tough on them during the program (Question 2) by pointing to the sad face. Student 3 indicated a neutral response to that item by pointing to the neutral face. All three students pointed to the sad face when presented with the item regarding the existence of better reading programs than the one their parent used (Question 3). When interpreting these results, it is important to consider that the wording of two of the items on the child social validity measure (i.e., the items regarding parents being tough on them during the program and the existence of better programs) may have been difficult for the children to understand. For example, no definition of the term “tough” was provided.

The parent participants also were asked to answer 12 questions about the feasibility and practicality of the intervention and the outcome of the program for their
children. A description of the Parent Social Validity Scale and its administration can be found in Chapter Three. Parent responses to this rating scale were examined qualitatively and are discussed here narratively. All parent responses were positive in response to the *Sound Foundations* intervention. No items were endorsed as “Strongly Disagree,” “Disagree,” or “Slightly Disagree.” In fact, the parent of Student 1 answered “Strongly Agree” to all 12 items. The parent of Student 2 answered “Strongly Agree” to 10 of the 12 items. The parent of Student 3 answered “Strongly Agree” to 7 of the 12 items. The strongest amount of agreement (i.e., responses of “Strongly Agree”) from all three parents was found on items regarding suggesting the intervention to other parents (Question 3), their child’s reading difficulty being severe enough for the intervention (Question 4), continuing the use of this intervention at home (Question 6), the intervention not resulting in negative effects (Question 7), the intervention being reasonable (Question 9), liking the procedures (Question 10), and the intervention being beneficial for other children (Question 12). The parents of Student 2 and 3 indicated “Agree” to the items regarding the intervention being acceptable for their child’s reading difficulty (Question 1) and the intervention being a good way to handle their child’s reading difficulty (Question 11). The parent of Student 3 also indicated “Agree” in response to the items regarding the appropriateness and suitability of the intervention (Questions 2, 5, and 8). Overall, the response to the intervention by the parents was positive and it appears that all of the parents believed that the program helped their children’s reading deficiencies. Informally, one of the parents mentioned that she would like to see her child exposed to learning to recognize words in the course of an intervention she would prefer to use at home.
Chapter Five

Discussion

Previous research has demonstrated the important role that parents play in developing reading skills in their children and the success that parents can have when using specific intervention procedures, but little research has examined the effectiveness of a parent-implemented, phonological awareness program. The purpose of this study was to investigate the impact of the Sound Foundations program implemented by parents on the phonological awareness skills of kindergarten students with phonological awareness deficits. It was hypothesized that parent implementation of the Sound Foundations program would increase the students’ phonological awareness skills. This chapter re-examines the results related to the hypothesis and to the literature. Additionally, this chapter discusses implications for practice, limitations of the study, and directions for future research.

Summary of Results and Relation to Existing Literature

Student outcomes. Results were based on the examination of changes in mean, changes in slope, changes in level, latency of change, analysis of variability, and analysis of nonoverlapping data points across baseline, intervention, and follow-up phases for each participant. The performance of the participants across phases provided some degree of evidence, although not strong or conclusive, that Sound Foundations resulted in an improvement in phonological awareness during the course of the intervention.
Specifically, the students’ performance on the Phoneme Segmentation Fluency (PSF) measure indicated that the parent intervention was effective to some extent in increasing phonological awareness skills in two of the three children included in this study. During intervention, the performance of Students 1 and 2 appeared to show clearer intervention effects than the performance of Student 3. There was inconclusive evidence, based on the follow-up data collected, regarding the long-lasting effects of the intervention after its withdrawal. After intervention withdrawal, it appeared that no deterioration of skill occurred for two students (although no continued growth was evident either) while one student’s skill level deteriorated.

The strongest intervention effects were seen for Student 1. Changes in mean, level, and slope (regarding the number of phonemes correct on the PSF measure) were all in the positive, hypothesized direction. Student 1’s performance began to increase shortly after the introduction of the intervention and the data revealed low overlap between the baseline and intervention phases. Regarding maintenance effects, the data collected during follow-up is less convincing for Student 1. Student 1’s skills appeared to deteriorate after withdrawal of the intervention. Although Student 1 showed an increase in mean from intervention to follow-up, the changes in level and slope were in the negative direction from intervention to follow-up. Based on these follow-up data, it appears that, without ongoing support, Student 1 will not maintain the higher levels of performance gained during the course of the intervention.

Student 2 also showed a somewhat positive reaction to the parent intervention. Student 2’s trendline changed from a decreasing trend during baseline to an increasing trend after intervention. Changes in level and mean were positive, although the change
was not as great as with Student 1. For example, the overall change in mean (from baseline to intervention) was an increase of only three phonemes per minute. Making conclusions regarding intervention effects more uncertain, Student 2 did not show immediate improvements after the intervention was introduced and showed a higher amount of overlap than Student 1. The lack of immediate change for Student 2 may be due to the *Sound Foundations* program’s slow pace and introduction of content (i.e., one phoneme in one position per intervention session). Student 2 also displayed the same inconclusive data regarding maintenance of the phonological awareness improvements during follow-up. Student 2’s mean number of phonemes per minute increased during follow-up, but changes in slope and level decreased. More encouraging, however, is that Student 2 maintained a consistent level of performance during follow-up. Student 2’s stable slope during follow-up indicated that he neither improved nor worsened in performance immediately after intervention removal. Based on the follow-up data collected, it appears that Student 2 maintained a steady level of performance, which is higher than baseline performance, after the intervention was withdrawn.

The weakest effects were seen for Student 3. Initial visual inspection of Student 3’s graph provided the impression that minimal gains were made after intervention. Trendlines during both baseline and intervention were increasing, and both phases consisted of highly variable data. Upon closer inspection of the data, Student 3 did evidence small increases in slope, mean, and level over time. However, Student 3’s increases in slope and level were the smallest of all participants. Student 3’s increase in mean was only one point higher than Student 2, an increase of 4 phonemes correct per
minute from baseline mean to intervention mean. Moreover, overlap between baseline and intervention data did not demonstrate any evidence of change across time.

The most obvious explanation for Student 3’s lack of any significant growth can be found when considering Student 3’s diagnosed articulation disorder. Recent research has explored and confirmed that children with articulation delays are more at-risk for less advanced phonological awareness skills than children without articulation delays (Senechal, Ouellette, & Young, 2004; Thomas & Senechal, 1998, 2004). This research suggests that more intensive and comprehensive interventions may be necessary for students with co-morbid articulation and phonological awareness delays. It is likely that Student 3 responded differently to this parent intervention due to her articulation difficulty and its relationship to the development of phonological awareness.

Overall, the PSF scores of all three students ranged from the deficit and low-end of the emerging range during baseline to the upper limits of the emerging range at the end of the intervention phases, when considering DIBELS benchmark goals. However, each student failed to reach grade-level expectations, because end-of-year kindergarten students should be able to produce 35 or more phonemes per minute on the PSF measure to demonstrate “established phonological awareness.” None of the students produced 35 phonemes per minute or more during or after intervention. Thus, although the performance of two of the participants (Students 1 and 2) improved during implementation of Sound Foundations, the amount of meaningful improvement is questionable because it did not reach a practical and recommended level to support further reading development.
Student outcomes also can be examined in terms of adequate rate of progress (Baker, Katz, & Fien, 2005). For students who are at the intensive level of instruction (high risk), adequate progress means being at some risk or low risk by the next DIBELS benchmark period. For students at the strategic instructional level (moderate risk), adequate progress means that they are at low risk by the next benchmark. For students who are at benchmark (low risk), adequate progress means being low risk at the next benchmark period. Considering Student 1’s rate of progress (0.19 PPM per day), only four and a half additional weeks of the same intervention would be needed to meet the DIBELS benchmark level of established phonological awareness (35 or more PPM on the PSF measure). Therefore, a total of ten weeks of intervention would take Student 1 from being high risk to benchmark. Student 1’s level of skill development can be considered to meet the guidelines for adequate rate of progress.

In reviewing the literature, it was found that many researchers have called for more investigation of training parents in specific home-based activities that promote reading development (e.g., Evans et al., 2000; Rush, 1999). There currently exists much promising research into this area of specific parent-based interventions (e.g., Fielding-Barnsley & Purdie, 2003; Powell-Smith et al., 2000; Wilks & Clarke, 1988). However, much less research exists examining the effectiveness of parent-based phonological awareness interventions (e.g., Gang & Poche, 1982; White, Solity, & Reeve, 1984). The results of the present study contribute to the knowledge base by helping to fill in the gap in this area of research.

Of the parent-based phonological awareness intervention studies reviewed, parents taught phonological awareness to their children in a number of different ways.
One study trained parents to use a highly structured approach to teach sounds, sound combinations, and sound blending (Gang & Poche, 1982). A second study employed the use of precision teaching to teach letter sounds, blending skills, initial and final blends, and discrimination skills (White, Solity, & Reeve, 1984). A third approach involved the use of Direct Instruction (DI) to teach their children letter-sound identification, blending sounds, and rhyming (Leach & Siddall, 1990). The content of the interventions in all three of these studies was more comprehensive and intense than the content delivered by the parents in the present study as part of the Sound Foundations program, which focuses solely on phoneme recognition in the initial and final positions of words.

Like the present study, the results reported in existing literature demonstrate promising but inconclusive evidence regarding the effectiveness of parent-based phonological awareness interventions. As summarized previously, the current study demonstrated limited effectiveness of the parent program with some of the participants. All three studies in the existing literature used group designs showing that participants increased performance on the skills measured. All three studies involved design flaws (e.g., no control group, no reliability or validity data reported for measure used, etc.) limiting confidence in the effects of the specific interventions employed. One study, that compared four parent approaches, revealed that the phonological awareness approach was effective but no more effective than one of the other parent-implemented approaches (Paired Reading) (Leach & Siddall, 1990). It is clear, based on existing research and this current study, that exploration of parent tutoring in phonological awareness skills is in its initial stages and that more information and clarity is needed before irrefutable conclusions can be drawn.
Design. Also important to consider is the level of confidence that can be placed in the results of this study based on the extent of adherence to the proposed multiple baseline design. One intent of this study was to employ a single-case design to show outcomes of individual students over time. The multiple baseline design provides control and confidence in intervention effects because each baseline serves as the control for the previous baseline. Ideal confidence in intervention effects is created when one participant’s performance improves after intervention implementation while the performance of participants not exposed to the intervention does not change (Cooper, Heron, & Heward, 1987). This staggered effect becomes stronger the more it is replicated across subjects (Kazdin, 1978). In the present study, the intervention effects between Students 1 and 2 were apparent; Student 2’s baseline data remained stable with little variability while Student 1’s levels of phonological awareness improved after the Sound Foundations program was implemented. On the contrary, this pattern was not replicated with a third baseline (Student 3); Student 3’s baseline levels did not remain stable and displayed excessive variability. Intervention for Students 1 and 2 was begun before Student 3 demonstrated a stable baseline. Additionally, Student 3 did not evidence significant change after introduction of the Sound Foundations intervention. Thus, because the intervention was implemented without stable baselines across all participants some control was compromised. Further, because change in performance was not replicated across all participants, the results of this study are not definitive regarding the effectiveness of Sound Foundations as a parent intervention as implemented in this study.
Social validity and treatment integrity. Finally, a brief review of treatment integrity and social validity information revealed that the parents in this study were able to carry out the intervention in the way that it was intended and that both parents and children held positive opinions about the intervention program. This information is encouraging because one goal of this study was to improve on past research by using an intervention that was not intrusive, did not require intensive training, and was easy for parents to implement. Although the research is limited in this area, previous studies employing parent implementation of phonological awareness interventions involved time-consuming training methods and complex intervention procedures (e.g., Gang & Poche, 1982; Leach & Siddall, 1990). For example, Gang and Poche (1982) included six parent training sessions lasting two and one half hours each, for a total of 15 hours of parent training. Leach and Siddall (1990) trained parents in Direct Instruction in a session lasting four and one half hours. The current study successfully trained the parent participants in one brief session lasting only one hour. The results of the studies that employed more complex training and intervention procedures were positive yet inconclusive due to design flaws and comparison interventions resulting in equal levels of effectiveness. Considering the outcomes of these studies, it remains unclear whether a greater level of training and complexity is needed to yield stronger effects than the intervention procedures required in the current study.

Implications for Practice

Although the results are not conclusive, this study has added to the knowledge base regarding parent-implemented interventions and has important implications for
practice and application in the schools. In this discussion, these implications will be linked to the everyday practice of school psychologists.

A basic implication surfacing from this study is that parents can be valuable resources in schools for providing supplemental support for children at-risk for reading failure. Parent involvement in early reading has a long history of promotion. For example, advertisements on television encourage parents to read with their children to develop a commitment to reading. However, studies such as this one suggest that parents can do more to promote literacy than just developing an interest in reading. Specifically, in addition to shared reading, parents can learn specific techniques designed to affect their children’s foundation literacy skills. In this study, parents easily learned and implemented a phonological awareness intervention according to protocol. An important component of this study was the support provided by the researcher in teaching the intervention, monitoring the parents’ implementation integrity, and answering parent questions. The school psychologist can play this role in the school system by training parents and assisting in their success of intervention implementation and effectiveness. The specific role the school psychologist would have is illustrated in the following discussion.

Perhaps the most important implication is that the *Sound Foundations* program has the potential to increase phonological awareness skills in some children but that this program implemented as it was in this study may not be enough for meaningful change. A possible explanation for the lack of robust and clear-cut results can be found in referring to research completed by Good et al. (1998). Good et al. (1998) explicated five features of effective phonological awareness programs (see Literature Review for further
discussion). Of the five features, *Sound Foundations* meets all of these criteria except for one: inclusion of instruction in sound identification, blending and segmenting, and letter-sound correspondence. The *Sound Foundations* program focuses on sound identification but does not teach sound blending, sound segmenting, or letter-sound correspondence. The focus of the program may be sufficient for some children. However, as concluded by the authors of *Sound Foundations* themselves, some children also may require more diverse instruction, such as in segmenting and blending skills (Byrne et al., 2000).

The *Sound Foundations* program was chosen for this study because of the extensive research on its effectiveness and, especially, for its ease of use and adaptation for parents. For school psychologists planning parent training and parent intervention programs, the use of *Sound Foundations* for sound identification development is recommended based on the confirmation this study provides on its ease of use for parents and based on previous research completed by the program developers on its effectiveness. However, school psychologists should recognize the limitations of *Sound Foundations* and should consider the use of supplemental materials and/or additional programs designed to address blending, segmenting, and letter-sound correspondence. *Sound Foundations* could be one piece of a multi-component intervention.

The school psychologist is uniquely positioned in the school system to be able to identify the individual needs of students, thus being able to tailor a parent intervention program to student needs. School psychologists have the ability to assess students’ skills, by using screening tools such as the DIBELS measure that was used in this study, and to monitor student progress over time (i.e., before, during, and after an intervention). Decisions regarding the extent of the parent intervention required should be based on the
individual needs of the student determined by this type of assessment and progress monitoring. For example, a school psychologist may administer the DIBELS and determine that a particular kindergarten student shows deficits in sound identification and sound blending. The school psychologist may decide to focus first on the precursor skill of sound identification by assisting this student’s parents in implementation of Sound Foundations. As the program progresses, the school psychologist would monitor the student’s progress in sound identification over time. When the student reached criteria for established sound identification skills, the school psychologist would then identify a program for this student’s parents to use in order to address the deficit in sound blending. This process could be continued as much as is necessary based on the student’s development of early literacy skills and, even, reading ability.

Limitations

Several limitations exist when considering internal validity and the methods of the study. The first one of these limitations involves the equivalency of the student participants. An assumption of the multiple baseline design is that participants have similar characteristics and are exposed to similar environments (Barlow & Hersen, 1984). However, one of this study’s participants displayed an articulation disorder, making it difficult to determine if this characteristic interfered with intervention effects. The second limitation was discussed previously. This is the limitation involving the failure to replicate intervention effects across all participants and the failure to establish stable baselines with low variability across all participants. Control is compromised because of this limitation, making results ambiguous. A third limitation inherent in the study’s procedures was the length of the follow-up phase. After withdrawal of the
intervention, participants were monitored for one week, allowing for the collection of three data points. The short length of the phase and the small number of data points poses a challenge to drawing reliable conclusions regarding maintenance of performance and long-term effects of this intervention. A fourth limitation is the narrow focus of the *Sound Foundations* intervention. As mentioned previously, this intervention’s content focuses on phoneme identification and does not address all areas of phonological awareness (e.g., segmenting, blending, letter-sound association). This lack of comprehensive content may limit the ability to observe significant changes in phonological awareness skills. Furthermore, the short duration of the program (five and a half weeks) may not have been enough time to allow for significant change in phonological awareness skills.

Threats to the external validity of this study also exist. One of these is the small sample size and the single-subject design. These features of the study limit the ability to generalize the results to the population, threatening external validity and the ability to interpret results. A second threat to the external validity of the study involves selection and characteristics of the parent participants. The parents in the study volunteered to participate and were interested in providing additional instructional support in the home. These parent participants may be different in some way (e.g., motivation, skill level, enthusiasm) to parents who do not volunteer to participate or who are not interested in home tutoring activities. Thus, the results of this study may not be applicable to all parents. The external validity of single-subject studies can be improved through replication of the study in different settings or with different participants (Barlow & Hersen, 1984; Kazdin, 1978).
Directions for Future Research

Perhaps the most important recommendation for future research is to continue the exploration of parent-based phonological awareness programs, especially considering the potential that this study and previous studies have demonstrated. To improve upon currently available research, stronger designs demonstrating stronger effects are needed. Continued use of single-case designs is recommended to indicate effects of parent-based interventions on individual students. However, it is crucial that future studies are designed in a way that can improve upon the present study.

First of all, future research utilizing multiple baselines could be strengthened greatly by ensuring control and replicating results across all baselines. A clearer demonstration of intervention effects across all participants would strengthen the research base by allowing for more straightforward and strong conclusions.

Secondly, future research should focus on components of the intervention process that can be altered and improved. One way to do this would be to explore parent-based curriculum that involves all components of effective phonological awareness programs (Good et al., 1998). To improve on the procedures used in the present study, the content of the intervention used in future research should include instruction in various aspects of phonological awareness development, including sound identification, blending and segmenting, and letter-sound correspondence. The key will be to incorporate these aspects of phonological awareness training while maintaining efficiency and cost-effectiveness. Maintaining these elements will help to ensure parent and student satisfaction with the program as well as to preserve the feasibility of employing parent-training programs in schools. A second addition to and improvement of the intervention
procedures used in this study is incorporating student self-graphing and reinforcement components into the intervention. Future research could examine whether this type of student self-monitoring element improves student outcomes.

Thirdly, because the results of the present study indicated inconsistent intervention effects across participants, it would be important to examine the interaction of participants’ characteristics and the success of the intervention. Examining these issues would help researchers to identify characteristics of students that contribute to or reduce the effectiveness of parent approaches.

A fourth consideration for future research is exploring the barriers parents may experience in successfully implementing parent interventions. These barriers could include management of student behavior during intervention sessions; qualitative differences between parents, such as parent skill level, parent level of education, and parent levels of motivation; and time constraints placed on parents in relation to lifestyle and employment. Research into these barriers would explicate the types of training programs and support mechanisms parents need to enhance their success with home-based interventions.

Future research also should consider gathering qualitative information about how parents can fit a home intervention into their daily schedules. This can be accomplished by incorporating a parent interview into the social validity data collection process. The social validity data collection process also can be improved by showing the parents the data and progress of their child during the course of the intervention. This would allow parents to have the information needed to evaluate effectively and accurately the intervention process.
Finally, future research should plan for more extensive exploration of the long-term effects of parent-based phonological awareness interventions, by examining the maintenance of phonological awareness skills after intervention withdrawal for a longer period of time than the present study and also by evaluating the impact over time on participants’ development of reading skills.

**Conclusion**

This study explored the effects of a parent-implemented phonological awareness intervention, *Sound Foundations*, on the phonological awareness skills of three kindergarten children with phonological awareness deficits. Overall, the results of the study indicated inconsistent intervention effects across student participants. Additionally, although gains were made by some of the participants, none of the participants reached a level of established phonological awareness skills during or after the intervention. Optimistically, parents were able to implement the intervention acceptably and parent and student social validity results were very positive. In summary, the present study provides preliminary evidence that children may benefit from parent support in phonological awareness development and clarifies directions for future research that will enhance our ability to draw more definitive conclusions.
References


Appendices
Appendix A: Parent Social Validity Scale

Please circle the answer which best describes your agreement or disagreement with each statement.

1. This was an acceptable intervention for my child’s reading difficulty.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree

2. Most parents would find this intervention appropriate for reading difficulties.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree

3. I would suggest the use of this intervention to other parents.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree

4. My child’s reading difficulty was severe enough to warrant use of this intervention.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree

5. Most parents would find this intervention suitable for reading difficulties.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree

6. I would be willing to continue using this intervention at home.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree

7. This intervention would not result in negative side-effects for a child.

   Strongly Disagree   Slightly Disagree   Slightly Agree   Agree   Strongly Agree
Appendix A (Continued)

8. This intervention would be appropriate for a variety of children.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>Slightly</th>
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<th>Strongly</th>
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<tbody>
<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Agree</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
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9. This intervention is reasonable for other children with similar reading difficulties.

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<tr>
<th>Strongly</th>
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<tbody>
<tr>
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<td>Agree</td>
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<tr>
<td>Disagree</td>
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<td>Agree</td>
<td>Agree</td>
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</table>

10. I liked the procedures used in this intervention.

<table>
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<tr>
<th>Strongly</th>
<th>Slightly</th>
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<tbody>
<tr>
<td>Disagree</td>
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<td>Agree</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
<td>Agree</td>
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</table>

11. This intervention was a good way to handle my child’s reading difficulty.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>Slightly</th>
<th>Slightly</th>
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<td>Disagree</td>
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<td>Agree</td>
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12. Overall, this intervention would be beneficial for other children.

<table>
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<tr>
<th>Strongly</th>
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<th>Slightly</th>
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<tbody>
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<td>Disagree</td>
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<td>Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>
Appendix B: Child Social Validity Scale

I am going to read you some questions about the reading program your mom/dad has been doing with you for the past few weeks. Answer each question as best as you can by pointing to the picture that shows how you feel about it (card with picture cues will be shown to the child).

1. The reading program my mom/dad used to help with my reading difficulty was good.
   1 2 3

2. My mom/dad was too tough on me during the reading program.
   1 2 3

3. There are better programs to help with my reading difficulty other than the one my mom/dad used.
   1 2 3

4. The reading program used by my mom/dad would be a good one to use with other children.
   1 2 3

5. I liked the reading program my mom/dad used with me.
   1 2 3

6. I think that the reading program used for my reading difficulty will help me do better in school.
   1 2 3
Appendix C: Participant Recruitment and Consent for Screening Letter

Date: ______________

Dear Parent(s):

We are conducting a research project to examine the effectiveness of a parent-based tutoring program on children’s early reading skills. This will be completed by involving parents in a specific tutoring program focused on phonological awareness (knowledge of the sounds of our language) and carefully monitoring children’s progress over time. We would like your participation in this project if your child meets selection criteria. You have received this letter because you are a parent of a kindergarten student and your child has been selected by your child’s teacher as a student who likely would benefit from this opportunity.

This program will be targeting children with delayed phonological awareness skills and will occur over the summer. In order to select students, we would like to ask for your permission to screen your child’s level of phonological awareness skills. This screening would involve completing three brief measures requiring your child either to segment words into their sounds (e.g., “dog” would be “/d/-/o/-/g/”) or to identify the first sounds of words (e.g., “pig” starts with “/p/”). Most children find these activities enjoyable, and they can be completed with your child quickly (1-3 minutes each). The information to be collected will be the number of sounds identified correctly in a one-minute period. An average of the three measures will be taken to determine your child’s score. Children scoring below 10 correct sounds per minute will meet the selection criteria and considered for participation in this research project. Regardless of whether your child meets selection criteria, you will receive a summary of the screening results.
Appendix C (Continued)

If you indicate interest to participate and if your child meets selection criteria (below 10 correct sounds per minute on the screening tool), you will be asked to participate in a home-based parent tutoring program that focuses on building children’s awareness of sounds. As part of your participation in this program, you will be asked to attend a one-hour training session in order to learn how to implement the parent tutoring program. You will engage in the program with your child for 25-30 minutes, two days per week. The program will last for five and a half weeks. In addition to the program, you will be called after the first and third weeks of the intervention to be asked how the program is going and if you have any questions. Also, you will be asked to complete a short checklist of the home-tutoring activities after each intervention session, which will take no longer than 3-5 minutes to complete each time. At the conclusion of the project, you will be asked to complete a short survey asking if you liked the tutoring program and if you thought it was effective.

Additionally, you will be asked to allow the investigator to collect information to monitor your child’s progress in phonological awareness. The information to be collected will be the same as the information collected during the screening, and the same measure will be used. This information will be collected before, during, and after the parent program. Before the program, the information will be collected three times per week. Based on when you are chosen to begin the parent program, this data collection period can last from two to six weeks. During the program, the information will be collected two times per week for five and a half weeks (the length of the program). After the program, the information will be collected three times per week for one week. This
Appendix C (Continued)

information collection will occur either at your home or at an agreed upon location (such as a library or community center), based on your preference. At the end of the project, your child will be asked to complete a short survey read to him or her by the investigator asking him or her if they liked the program. In order to participate in this program, you and your child must be available to participate in the intervention and data collection periods described previously.

By taking part in this research study, the potential benefits for parents include but are not limited to: (a) an opportunity to increase your overall knowledge of ways to help your child develop early reading skills at home, (b) an increase in opportunities to participate in your child’s education, (c) an increased awareness of your child’s early reading skills, and (d) an increase in pleasurable home literacy interactions. Your child may experience the following benefits: (a) an increase in phonological awareness skills, such by learning to identify words that start or end with the same sounds, (b) increased interaction time with a parent, (c) increased confidence in their ability to learn to read, (d) opportunity to receive additional assistance beyond what is received at school.

The possible risks of participation in this study are minimal. Participation in this study will not affect your child’s student status or grades.

All information obtained during this study will be held in confidence. The data will be recorded in a database on the principal investigator's computer. Each participant will receive a research ID number that will be used to keep track of the scores. The names of each subject will be kept in a separate file on a disk that will be locked in a filing
Appendix C (Continued)

cabinet. The files will be deleted from the computer and disk after a maximum of three years.

Please note that you and your child will not be paid for your child’s participation in this study.

If you have any questions about this research study, contact Andrea Ofiara or Kelly Powell-Smith, Ph.D., at the following addresses or telephone numbers:

Andrea Ofiara  Kelly Powell-Smith, Ph.D.
2405 Spring Hollow Loop  USF School Psychology Program
Wesley Chapel, FL 33543  4202 E. Fowler Avenue, EDU 162
(813) 991-1664  Tampa, FL 33620

Please complete and return the attached form to Andrea Ofiara at the previously mentioned address by _____________. Please note that returning this form does not constitute an obligation to participate or consent for participation.

Sincerely,

Andrea Ofiara  Kelly Powell-Smith
Primary Investigator  Associate Professor

USF School Psychology Program
Appendix C (Continued)

I am interested in potentially participating in the project and provide consent for the screening of my child’s phonological awareness skills. I understand that our participation in the project is based on my child meeting the screening criteria described previously.

Check one: _____ Yes _____ No

Signature: _______________________________ Date: __________________

If YES, please complete the following:

Your name: ______________________________

Address: ____________________________________________

________________________________________________________________

Phone Number: ____________________________

Child’s Name: _____________________________

Kindergarten Teacher’s Name: _____________________________

Please return this form to Andrea Ofiara by _________________. 
Appendix D: Parental Informed Consent

The following information is being presented to help you decide whether or not you want to allow your child to be a part of a minimal risk research study. Please read this carefully. If you do not understand anything, ask the person in charge of the study.

**Title of research study:** The Effects of a Parent Intervention on the Phonological Awareness Skills of Kindergarten Students

**Person in charge of study:** Andrea Ofiara, a graduate student at the University of South Florida in the School Psychology Program, who is completing this study for her thesis project.

**Where the study will be done:** The parent intervention will occur in your home. Evaluation of your child’s phonological awareness skills (e.g., knowledge of the sounds of our language) will occur either at your home or at an agreed upon location (such as a local library or community center), based on your preference.

**Your child is being asked to participate because** your child has been identified as having a deficit in phonological awareness and is likely to benefit from this opportunity. A deficit in phonological awareness means that he or she has not developed the knowledge of the sounds of our language to an adequate level for a child of his or her age. The development of phonological awareness predicts future reading success.

**You are being asked to participate because** you are a parent of a kindergarten student who has been identified by your child’s teacher as a child likely to benefit from participation in this study. Parents have an important role in helping their children develop early reading skills, such as phonological awareness.
Appendix D (Continued)

**General Information about the Research Study**

The purpose of this research study is to determine the effects of a parent intervention program on the phonological awareness skills of kindergarten students with deficits in phonological awareness.

**Plan of Study**

You will be asked to participate in a home-based parent tutoring program that focuses on building children’s awareness of sounds. You will be asked to attend a one-hour training session in order to learn how to implement the parent tutoring program. You will engage in the program with your child for 25-30 minutes, two days per week. The program will last for five and a half weeks. In addition to the program, you will be called after the first and third weeks of the intervention to be asked how the program is going and if you have any questions. You can expect the phone call to be no more than 5-10 minutes. Also, you will be asked to complete a short checklist of the home-tutoring activities after each intervention session, which will take no longer than 3-5 minutes to complete each time. At the conclusion of the project, you will be asked to complete a short survey asking if you liked the tutoring program and if you thought it was effective.

Also, you will be asked to allow the investigator to collect information to monitor your child’s progress in phonological awareness. The information to be collected will be the number of sounds identified correctly in a one-minute period. Your child will be asked either to segment words into their sounds (e.g., “dog” would be “/d/-/o/-/g/”) or to identify the first sounds of words (e.g., “pig” starts with “/p/”). Most children find these activities enjoyable, and they can be completed with your child quickly (1-3 minutes).
Appendix D (Continued)

This information will be collected before, during, and after the parent program. Before the program, the information will be collected three times per week. Based on when you are chosen to begin the parent program, this data collection period can last from two to six weeks. During the program, the information will be collected two times per week for five and a half weeks (the length of the program). After the program, the information will be collected three times per week for one week. This information collection will occur either at your home or at an agreed upon location (such as a library or community center), based on your preference. At the end of the project, your child will be asked to complete a short survey read to him or her by the investigator asking him or her if they liked the program.

In order to participate in this program, you and your child must be available to participate in the intervention and data collection periods described previously.

Payment for Participation

You and your child will not be paid for your child’s participation in this study.

Benefits of Taking Part in this Research Study

By taking part in this research study, the potential benefits for parents include but are not limited to: (a) an opportunity to increase your overall knowledge of ways to help your child develop early reading skills at home, (b) an increase in opportunities to participate in your child’s education, (c) an increased awareness of your child’s early reading skills, and (d) an increase in pleasurable home literacy interactions. Your child may experience the following benefits: (a) an increase in phonological awareness skills, such by learning to identify words that start or end with the same sounds, (b) increased
interaction time with a parent, (c) increased confidence in their ability to learn to read, (d) opportunity to receive additional assistance beyond what is received at school.

*Risks of Being a Part of this Research Study*

The possible risks of participation in this study are minimal. Participation in this study will not affect your child’s student status or grades.

*Confidentiality of Your Child’s Records*

You and your child’s privacy and research records will be kept confidential to the full extent required by law. Authorized research personnel, employees of the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project. The results of this study may be published. However, the published results will not include your child’s name or any other information that would personally identify your child in any way.

The data collected will be recorded in a database on the principal investigator’s computer. Each participant will receive a research ID number that will be used to keep track of the scores. The names of each subject will be kept in a separate file on a disk that will be locked in a filing cabinet. The files will be deleted from the computer and disk after a maximum of three years.

*Volunteering to Take Part in this Research Study*

Your decision to participate and to allow your child to participate in this research study is completely voluntary. You are free to participate and to allow your child to participate in this research study or to withdraw yourself and him/her at any time. If you
choose not to allow your child to participate or if you remove yourself and your child from the study, there will be no penalty or loss of benefits that you or your child are entitled to receive.

Questions and Contacts

If you have any questions about this research study, contact Andrea Ofiara at (813) 991-1664 or Kelly Powell-Smith, Ph.D. at (813) 974-9698. If you have questions about your rights as a person who is taking part in a research study, you may contact the Division of Research Compliance of the University of South Florida at (813) 974-5638.

Consent for Child to Take Part in this Research Study

I freely give my consent to let my child take part in this study. I understand that this is research. I have received a copy of this consent form.

________________________
Signature of Parent

________________________
Printed Name of Parent

___________
Date

of child taking part in study

Investigator Statement

I have carefully explained to the subject the nature of the above protocol. I hereby certify that to the best of my knowledge the subject signing this consent form understands the nature, demands, risks, and benefits involved in participating in this study.

________________________
Signature of Investigator

________________________
Printed Name of Investigator

___________
Date
Appendix E: Agenda for Parent Instruction Session

I. Objectives of the training session

II. Review of the purpose of the project

III. Review of the parent tutoring procedures

   A. Discussion of each component of *Sound Foundations*

      1. Poems and stories on cassette tape
      2. Poster procedures
         a. Child finds words containing corresponding phoneme
         b. Parent points out pictures the child has missed and asks, “What is this a picture of?”
      3. Completion of the three worksheets

   B. Primary investigator models a typical tutoring session
      1. Phoneme in initial position
      2. Phoneme in final position

   C. Parent role play
      1. Phoneme in initial position
      2. Phoneme in final position

IV. Overview of intervention schedule

V. How to complete treatment integrity checklists

VI. Question and answer session

VII. Schedule time for follow-up phone call and times for student data collection.

VIII. Materials dispersed to parents and demographic information collected
Appendix F: Participant Demographic Information

Please answer the items on this page as best you can. This information is for research purposes and will be kept confidential. Answering these questions is voluntary and you may choose not to answer any or all of them. However, the information will be helpful to us in understanding the results of the research. Thank you for your time.

Place a check by your response or write in your response where needed:

1. Your name: ____________________ and Your child’s name: __________________
2. Your relationship to your child (e.g., mother, father) __________________
3. Your sex (circle): M F and Your child’s sex (circle): M F
4. Your age (circle): 18-24 25-34 35-44 45-54 55 & above Other:_____
5. Your child’s age: _____
6. Has your child ever received any Exceptional Student Education Services? (circle):

   Y   N

   If yes, which one(s)? ____________________________________________________________
7. Your education (check all that apply):

   I have completed:

   ___ grade school
   ___ high school
   ___ 2 year college (A.A. Degree)
   ___ 4 year college (B.A./B.S. Degree)
   ___ graduate or professional school
   ___ specialized vocational training
8. Your occupation: ____________________________________________

9. Ethnic background:

<table>
<thead>
<tr>
<th>You (check one)</th>
<th>Your Child (check one)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>___ Hispanic</td>
</tr>
<tr>
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<td>___ Native American</td>
</tr>
<tr>
<td>___ Non-hispanic Black</td>
<td>___ Non-hispanic Black</td>
</tr>
<tr>
<td>___ Non-hispanic white</td>
<td>___ Non-hispanic white</td>
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<tr>
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<td></td>
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<td></td>
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<tr>
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<td>Poems/story for beginning m</td>
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<td>Beginning m poster</td>
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<td></td>
<td>Beginning l worksheets (3)</td>
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Appendix G (Continued)

WEEK 4, DAY 2  Poems/story for ending l
                Ending l poster
                Ending l worksheets (3)

WEEK 5, DAY 1  Poems/story for beginning p
                Beginning p poster
                Beginning p worksheets (3)

WEEK 5, DAY 2  Poems/story for ending p
                Ending p poster
                Ending p worksheets (3)

WEEK 6, DAY 1  Poems/story for beginning a
                Beginning a poster
                Beginning a worksheets (3)
Appendix H: Intervention Activities Checklist

Parent’s Name: ______________________ Child’s Name: ______________________

Date: __________ Begin Time: __________ End Time: __________

Sound:_________ Position (circle):     Beginning          Ending

<table>
<thead>
<tr>
<th>Activity</th>
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<th>Time Begin</th>
<th>Time End</th>
<th>Comments</th>
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<td>______</td>
<td>______</td>
<td>______</td>
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<tr>
<td>tape</td>
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How well do you think this session went? ________________________________
_____________________________________________________________________
_____________________________________________________________________

Do you have any questions? If so, please note them here or contact Andrea Ofiara at

(813) 991-1664____________________________________________________________________
Appendix I: Telephone Checklist

Parent’s Name: __________________ Child’s Name: ______________________

Date: __________

After the first week of intervention, each parent will be called and asked the following questions.

1. How are things going? Do you have any questions or concerns?

2. Have you completed the tutoring two nights per week? Yes No

   If no, ask when they are completing the tutoring. Provide a reminder that the tutoring should be completed twice per week with at least one day in between sessions.

3. How long have the tutoring sessions lasted? ______________________________

4. Have you completed the following activities during each tutoring session?

<table>
<thead>
<tr>
<th>Activity</th>
<th>1st SESSION</th>
<th>2nd SESSION</th>
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<tr>
<td>Poster activity</td>
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</table>
Appendix I (Continued)

If any activity has not been completed, ask why. ____________________________

5. Do you feel you would benefit from a follow-up training session? Yes No

If yes, schedule a date and time for the follow-up session. ____________________________

If no, provide a brief reminder to complete the tutoring two times per week and to complete each activity each time. Thank the parent for their participation and their time.