

4-1-2012

# Phoneme-grapheme mapping

Shara Rae Barlow

Follow this and additional works at: <https://digitalcommons.stritch.edu/etd>



Part of the [Education Commons](#)

---

## Recommended Citation

Barlow, Shara Rae, "Phoneme-grapheme mapping" (2012). *Master's Theses, Capstones, and Projects*. 347.  
<https://digitalcommons.stritch.edu/etd/347>

This Action Research Paper is brought to you for free and open access by Stritch Shares. It has been accepted for inclusion in Master's Theses, Capstones, and Projects by an authorized administrator of Stritch Shares. For more information, please contact [smbagley@stritch.edu](mailto:smbagley@stritch.edu).

PHONEME-GRAPHEME MAPPING

By

SHARA RAE BARLOW

Action Research

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts in Special Education

at Cardinal Stritch University

Milwaukee, Wisconsin

2012

This action research  
has been approved for  
Cardinal Stritch University by

Director \_\_\_\_\_ *Sr. Gabrielle Kowalski* \_\_\_\_\_

Date \_\_\_\_\_ April, 2012 \_\_\_\_\_

## TABLE OF CONTENTS

	Page
Chapter 1	
Introduction .....	4
Purpose of the Study.....	4
Research Question .....	5
Significance of Study .....	6
Definition of Terms .....	6
Limitations and Assumptions .....	7
Summary .....	7
Chapter 2	
Review of Literature .....	9
Chapter 3: Methodology	
Design .....	14
Sample.....	15
Procedure .....	16
Data Collection Plan .....	17
Chapter 4	
Results .....	18
Chapter 5: Summary and Conclusions	
Interpretation .....	29
Implications .....	29
Recommendations .....	30
Appendix A .....	32
References .....	37

## Chapter 1

### Introduction

Students with various disabilities often struggle when given reading tasks. They have difficulty decoding the words and so they struggle to comprehend the meaning of the material they are given. Through my experiences I have found that students who do not learn at the same rate as their peers, students who have processing deficits and students who have lower cognitive functioning, need instruction in different modalities to acquire skills and make academic progress. The use of manipulatives, visuals, graphic organizers and other strategies that actively involve students work best to develop their understanding and increase their knowledge. Decoding takes students who struggle so much time and energy that there is little left for meaning making. In order to strengthen comprehension their decoding abilities must be strengthened. As a result, this study examined specific instruction in phoneme-grapheme development and its effect on students' decoding and encoding abilities.

### Purpose of the Study

The act of reading involves complex processes such as phonological awareness, fluency, vocabulary, phonics, and comprehension that are not hardwired into the human brain, thus they must be explicitly taught. In economically disadvantaged families, most primary caregivers do not have the time or expertise to provide this type of instruction to children (Jensen, 2009). Through my experiences I have seen this to be true and as an educator have strived to provide the missing instruction particularly to students with disabilities. The purpose of this study was to investigate whether a phoneme-grapheme mapping strategy helped African-American students from such families further develop their phoneme awareness, decoding, and spelling in order to improve their overall basic reading achievement.

This study involved two female students, twins, who were in the third grade and reading at the first grade level. Both have Individual Education Plans for Specific Learning Disabilities in the area of reading. One of the participants was also receiving services in the area of speech and language for receptive and expressive language. During the time of this study speech and language evaluations were completed on both participants and both were found to have word finding difficulties. By the end of the study both were receiving services in speech and language in addition to reading. This study had the potential to warrant additional research in the area of phoneme-grapheme mapping or incorporation of the strategy into classrooms.

### **Research Question**

A wealth of information exists to support the combined instruction of phonemes and graphemes. This study focused on two students within the urban school system. Despite all the existing research and information available, there has been no known research conducted using phoneme-grapheme mapping by anyone besides the author (K. Grace, personal communication, March 9, 2012) This research addressed the explicit instruction in phoneme-grapheme relationships and its effect on phoneme awareness, spelling, and word reading of African-American students who come from economically disadvantaged families.

In this study the students were assessed prior to beginning any activities. Based on the assessments from both participants the focus of instruction was determined. Instruction was delivered to the participants using the processes and procedures described by the author, Kathryn Grace, in her book *Phonics and Spelling through Phoneme-Grapheme Mapping*. First, the concept was taught and the participants segmented sounds. Second, the participants read words, marked the target sounds and said the target sounds. Last, the words were mapped using

phoneme-grapheme mapping paper, counters, and pencils. This step was complex. It required the participants to segment the dictated word into sounds using the counters and then assign the phonemes a grapheme and write it. After instruction the post tests were administered.

### **Significance of the Study**

This study was important because it used previously developed strategies with a small group of students that are part of a larger, growing population and who have been unsuccessful using more traditional instruction methods. The research added information in reading development for urban students to the ever expanding information pool. There has been a limited amount of research in this area specific to urban students when using phoneme-grapheme development as a focus. The results of this research helped to further strategy instruction for students who struggle to acquire skills through more traditional methods.

### **Definitions of Terms**

Comprehension – the ability to understand what is read either silently or aloud

Grapheme – the written representation of a sound in a language

Phoneme – the smallest unit of meaningful sound in a language

Strategy – a way of completing a given task

Traditional methods – teaching strategies, procedures, or processes that are generally accepted and used by most teachers and appear in most standards based curriculum

## **Limitations and Assumptions**

Several limitations existed with in this study. Because student attendance could be unpredictable this variable was controlled by choosing participants with good attendance records and by communicating with parents that attendance was important for their child's benefit. Also, participants came with various skill sets and retained material at different rates. While this could not be controlled, it was accounted for through pre-assessments. Both participants were in the same classroom and received the same general education and special education instruction in reading. Therefore, there will be limited effect on their knowledge due to different instruction. This study looked at the effect of phoneme-grapheme mapping on the reading skills of two participants. While it was not a comprehensive study, it warranted additional research.

Several assumptions were made in this study regarding the participants. First, they would be African-American urban students whom were living in poverty based on their free/reduced lunch status. Second, it was assumed that each participant had a documented disability. The participants' abilities were not the same but all struggled with reading. Also, it was assumed that the strategy would be delivered consistently and would address the participants specific needs based on the pre-assessment.

## **Summary**

African-American urban students struggle to develop reading skills for many reasons. Strategies that work to allow them to read better are in high demand. One innovative approach uses phoneme-grapheme relationships to increase word reading abilities. This increased ability to read words may ultimately increase reading comprehension so students are more successful in academics. There are limitations that must be taken into consideration. The history of phoneme-

grapheme instruction points toward the theory of brain-based learning and the notion that poverty does affect the brain. However, the brain can change so these students with decoding difficulties can be taught.

## Chapter 2

### Review of Literature

The earliest spelling research assumed that there was no consistent sound-symbol relationship when spelling words. Learning to spell individual words was considered to be an individual learning act. The use of mnemonic devices and word analysis were the primary focus for instruction. (Hanna, Hanna, Hodges, & Rudorf, 1966). However, research later showed there was “evidence that the encoding of the aural-oral language is (was) accomplished through the alphabetic principles” because 80% of the phonemes from the 3,000 most frequently used words were spelled consistently and 20% of the phonemes were irregular (Hanna, et al., 1966, p. 12).

The American-English Language is a major dialect of the English language and can be considered a separate language from English due to regional dialects. There are many words borrowed from other languages in the American-English Language which has led to inconsistencies in the alphabetic principle. Despite the inconsistencies “most American-English writers learn implicitly to assign appropriate graphemes to the phonemes of spoken words” (Hanna, et al., 1966, p. 12).

The American-English Language is an alphabetic language. One written symbol represents one phoneme. Spelling can become complicated due to combinations of graphemes representing the same phonemes. Languages can also be logographic, morphographic, or syllabic (Hanna, et al., 1966).

There have been three different schools of thought on teaching students to represent this alphabetic language. The traditional way involved formal direct instruction with drill, memorization, imitation and rote learning being the focus. (Held-Taylor, 1998). The transitional

method used phonetics, patterns (word sorts and word families), and reading to teach spelling. It also shared a focus on spelling rules, phonics, and weekly tests with traditional methods. The third spelling method was student oriented. It recognized that spelling is a developmental process and addressed individual needs by starting where the student was. This method used reading as a context for learning spelling (Held-Taylor, 1998).

Reading in the American-English Language requires at least a basic understanding of phonological awareness. The reader must know that words are made up of speech sounds and that “letters and sounds map on to each other in some systematic way” in order for them to decode words (Mauer & Kamhi, 1996, p.259). There are three skills that a reader needs. First, the typical reader must be able to recognize and distinguish between letters. Second, the reader must process phonological information. Lastly, the reader must associate letters with sounds (Mauer & Kamhi, 1996).

According to Mauer and Kamhi (1996) there are four distinct stages of reading development. First is the visual cue or logographic stage. Readers recognize corporate logos and symbols that represent meaning for them. Next is the alphabetic or phonetic stage, when the reader recognizes letters and begins to connect letters to sounds. In this stage context and cues are extremely important and phonological awareness is developed. The next step is controlled word recognition; the reader reads words by decoding them although it still requires great effort to do so. The last stage is automatically recognizing words, when word reading is efficient. A fifth stage, as described by Spear-Swerling and Sternberg (1994), is proficient adult reading in which a reader has highly developed comprehension and word recognition skills in order to be insightful, reflective, and analytical.

Students who experience reading difficulties and disabilities have failed to move from one reading development stage to the next. Transitions between stages are usually gradual and are not abrupt changes. There are some students who have a true biologically based deficit, mostly in phonological processes, which cause them to stop moving from one stage to the next. However, most reading difficulties have been affected in some way by the type of instruction being given. Thus, adjusting the students' instructional, social, and environmental situations may change their reading confidence and ability (Spear-Swerling & Sternberg, 1994).

Students with a biologically based deficit, most likely in phonological processing, and those without a biologically based deficit experience breakdowns in the reading process. Nonalphabetic readers lack phonetic skills to recognize words but use other cues like pictures and word shapes. Their comprehension will be low (Spear-Swerling & Sternberg, 1994). Students who do not fully develop at the second stage are compensatory readers that use sight-word knowledge or context clues to make up for their weak decoding skills (Spear-Swerling & Sternberg, 1994). Students who do not fully develop the third stage are nonautomatic readers. These students can decode but the slow speed at which they decode affects their comprehension (Spear-Swerling, & Sternberg, 1994). Lastly there are some students that are delayed readers. They acquire skills at a much slower rate and do not acquire the strategies that are required to move to the fourth stage (Spear-Swerling & Sternberg, 1994). All of these reading difficulties have a common link in that the reader is not using strategies efficiently.

Research in reading has found that some sounds are easier for a reader to identify than others. Initial consonants are easier to identify than vowels and final consonants. Final consonants are easier to identify than vowels (Treiman, Berch, & Weatherston, 1993). This fact also translates to spelling; the position of a phoneme affects the ability to spell it. The phonemes

at the edges, at the beginning and end of words are easier to spell than those at the middle of words (Treiman, et al., 1993). It has also been noted that vowels that end a multiple syllable word were more likely to be spelled correctly than a vowel within the word (Treiman, et. al., 1993).

Several innovators have influenced the area of literacy education. First, Samuel T. Orton and Anna Gillingham developed a multi-sensory approach that systematically instructed students to read using increasingly complex phonetic concepts and word and syllable patterns. Their work was originally published in 1935 and was titled *Remedial Training for Children with Specific Disability in Reading, Spelling, and Penmanship*. It was developed to help students with a language processing disorder, dyslexia (Orton-Gillingham Method, n.d.). Second, D. B. Elkonin, a Marxist and Russian psychologist, developed boxes used with tokens to assist young readers in understanding phonemes (Elkonin Boxes, n.d.). Third, Marie Clay developed Reading Recovery in the mid to late 1970s. She desired to bring the lowest achieving students in the area of reading up to the average range (Gaffney & Askew, n.d.). Clay's instruction included reading tasks, running records, working with letters and words with manipulatives, writing, and sequencing stories. Within these activities students were instructed on letter/sound relationships, and spelling patterns (Reading Recovery Lessons, n.d.).

The American-English Language is a highly predictable alphabetic language that can be learned. Over time there have been various methods used to teach students to use phonemes and graphemes in order to read and write. When students fail to learn they are often having difficulties with one or more learning processes in order to move to the next stage of learning. Students go through four main stages, logographic, phonetic, word recognition and automatic recognition of words. There are many versions of the learning stages of language; however most

follow a similar progression. Several leaders in education developed strategies to help students who failed to learn. Orton and Gillingham developed strategies for students with dyslexia. Elkonin developed a strategy to understand phonemes. Marie Clay developed a process to help the lowest achieving readers. Collectively, this knowledge has inspired Kathryn Grace to develop the phoneme-grapheme mapping strategy that this research has focused on. There has been no known research using Grace's mapping strategy according to Grace herself except for her own progress monitoring (email: Grace. 2012). She stated that her strategy has been cited in other researcher's work. This research contributed to Grace's own results.

## **Chapter 3**

### **Methodology**

#### **Design**

This study is considered quasi-experimental research in which an intervention was planned and its effect was studied. The independent variable in this study was the specific instruction in phonics areas of short vowels based on the pre-assessments of the students' skills. The dependent variables were the student's post-intervention scores in the areas of word reading, sound identification, and spelling.

A cause and effect relationship was hypothesized between the independent and dependent variables. In order to maintain internal validity the participants, who were identical twins, were instructed in the same general and special education classes. Therefore, they were exposed to the same instructional materials outside of the intervention. During the time of this study the curriculum that they received did not specifically instruct on short vowels, which was the focus of this intervention.

The external validity was somewhat compromised by the limits of the study. First, the sample size was very small and, therefore, generalization to a larger population may not be possible. However, the results may be generalized to similar groups in the special education environment. Second, the time constraints of the study were limiting and a longer period of treatment may have produced different results.

There were three schools of thought regarding the teaching of the representation of the English Language traditional, transitional and student oriented. Traditional instruction involved rote memorization and imitation. Transitional instruction included phonics, patterns, and reading

to teach spelling. Student oriented instruction included starting where the student is and developing their skills from there. This intervention was considered the third type of instruction. It focused on student need in order to ensure growth.

There have been other instructional approaches that were student oriented and have influenced this instructional strategy. This intervention combined the strategy of Elkonin's boxes with the use of manipulatives as in the Orton-Gillingham Approach. The boxes in phoneme-grapheme mapping, like Elkonin's, represented phonemes and graphemes were written in them. The two boxes differed in that Elkonin's boxes were much simpler and were less descriptive of the rules of the English Language than mapping boxes. Phoneme-grapheme mapping used colored manipulatives to represent phonemes, show patterns, and identify graphemes. The Orton-Gillingham Approach used manipulatives to analyze words as opposed to using manipulatives to construct words. Marie Clay's Reading Recovery used manipulative letters to build words which addressed the use of phonemes and graphemes differently. Both the Orton-Gillingham Approach and Reading Recovery taught to the needs of specific students which is similar to Phoneme-grapheme mapping

### **Sample**

The sample consisted of two African-American students, female identical twins, in third grade with disabilities in the area of reading. Both received special education services. One of the participants also was receiving services for a receptive and expressive language disorder. During the time of the study both participants were evaluated for a speech and language disability and were found to have word finding deficits which included sound/symbol relationships. The students were chosen because they participated in an after-school program.

## Procedures

The students completed three steps of the intervention each week using the *Phonics and Spelling through Phoneme-Grapheme Mapping* strategies that were developed by Kathryn Grace. Both participants showed a weakness with short vowel sounds based on the result of the pre-assessments. The participants did have other weaknesses but those were not addressed within the time constraints of this study.

The first step was to introduce the skill of short vowels one per session. The short vowels were introduced using the picture cues and actions as suggested by Grace. Words were read to the students and they verbally told how many sounds each word contained. It was important here to emphasize sounds not letters. The participants used blue counters for consonant sounds and red counters for vowel sounds. Then words from word lists were dictated and the students chose counters to represent the sounds that they heard. Then the participants touched the counters and said the sounds that make up each word.

The second step involved giving the students a list of the words from the previous step. The participants read the words to themselves and then chorally. The participants were then directed to find and say a focus sound. Then they circled a representation of the focus sound on a worksheet.

The last step was for the students to map out the words from the previous steps. The participants needed the same counters as in the first step as a visual and phoneme-grapheme mapping paper. The words were dictated to the participants. They put the counters on the mapping paper using their phoneme knowledge. Then they changed the phonemes into

graphemes and wrote the graphemes under the counters. To end the process the participants were asked to state the sound/spelling relationships.

Each session lasted 30 minutes per meeting two times per week. This process was completed in two sessions or one time per week. Each week covered one short vowel sound with two weeks of the short e and I sound because those were difficult for the participants. There were seven weeks of sessions for a total of 14 meetings.

### **Data Collection Plan**

This study addressed explicit instruction in phoneme-grapheme relationships and its effect on phoneme awareness, spelling, and word reading abilities of African-American students with disabilities who came from an economically disadvantaged family. The participants' basic literacy skills, specifically phoneme awareness, spelling, and word reading were assessed. The Word Identification and Spelling Test (WIST) was used to individually assess the participants. This norm-referenced assessment includes assessments of reading regular and irregular words, spelling of regular and irregular words, reading pseudo words and identifying letter sounds. Percentile rank, standard scores, and age and grade equivalents were obtained after raw scores were gathered. Also, an informal assessment of sound-symbol analysis was completed. This helped to inform instruction. See Appendix A.

Since the participants were identical twins they shared the same genetic makeup and environment; therefore the results may not generalize to other students. Also, the participants were female and the results may not be true for male students. As a result of these factors caution must be taken when generalizing the study to other populations.

## **Chapter 4**

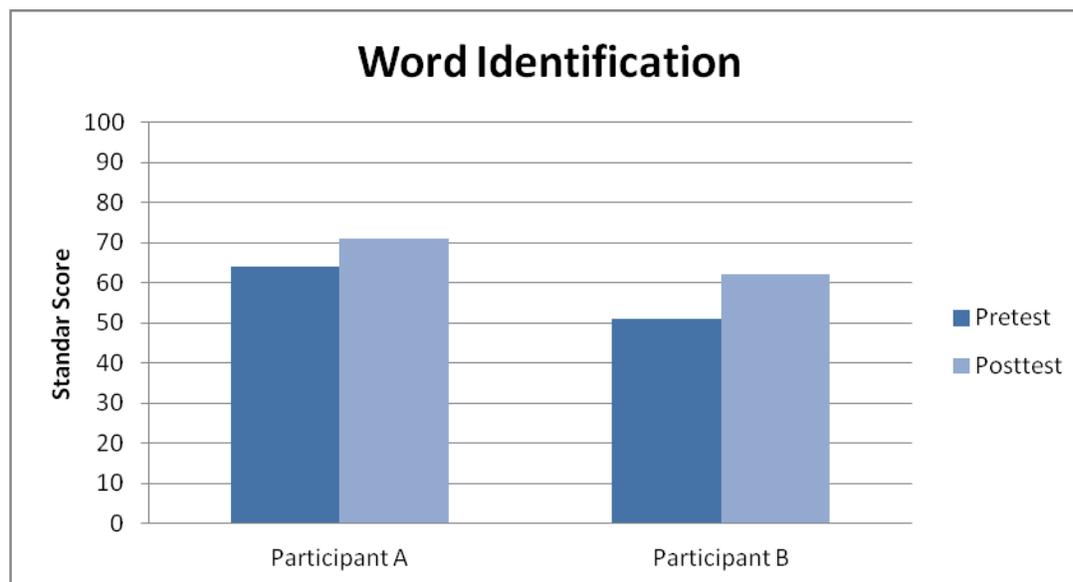
### **Results**

The participants were assessed before and after the treatment which generated a variety of scores. The norm-referenced assessment, Word Identification and Spelling Test (WIST), provided standard scores that compared the participants to the norm group. The assessment yielded three subtest standard scores and one composite standard score. It is important to note here that the pre assessments used the fall norms and the post assessments used the spring norms. There is expected growth between the two norms. The informal portion of the assessment analyzed the type of syllables that the participant could read and write.

The first area of assessment was Word Identification. This involved reading regular words, words that follow rules, and irregular words, words that do not follow rules. The scores were given as raw scores and standard scores.

Both participants showed growth overall in the area of Word Identification, see figure 1. The first participant's pretest standard score was 64. Her posttest standard score was 71, an increase of seven. Her raw score showed more growth. Her pretest raw score was 51 and her posttest score was 65, an increase of 14 correct answers. The second participant also showed growth. She had a standard score of 51 for the word reading pretest and a 62 for the post test, or a growth of 11. Her pretest raw score was 33 and the posttest score was 52, a growth of 19 correct answers.

Figure 1.



The second area of assessment was Spelling. This involved spelling regular words, words that follow rules, and irregular words, words that do not follow rules. The scores were given as raw scores and standard scores.

Both participants showed growth overall in the area of Spelling, see figure 2 and 3. The first participant's pretest standard score was 75. Her posttest standard score was 73, a decrease of two. Her raw score showed growth. Her pretest raw score was 19 and her posttest score was 23, an increase of 4 correct answers. The second participant also showed growth. She had a standard score of 71 for the spelling pretest and a 71 for the post test. Her pretest raw score was 12 and the posttest score was 19, a growth of 7 correct answers. In this area the growth of the norm-group, between fall and spring norms, was faster than the growth of the participants however, the participants did show growth.

Figure 2.

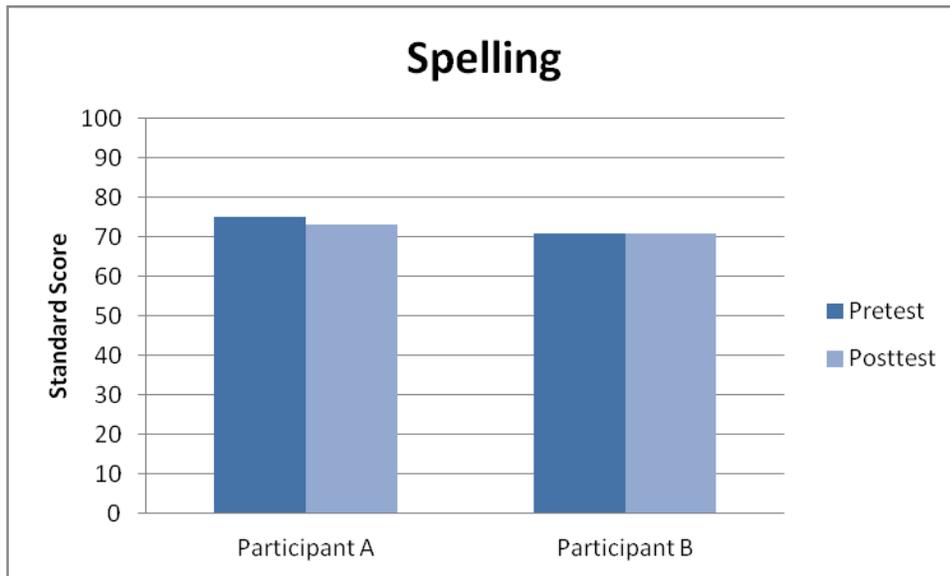
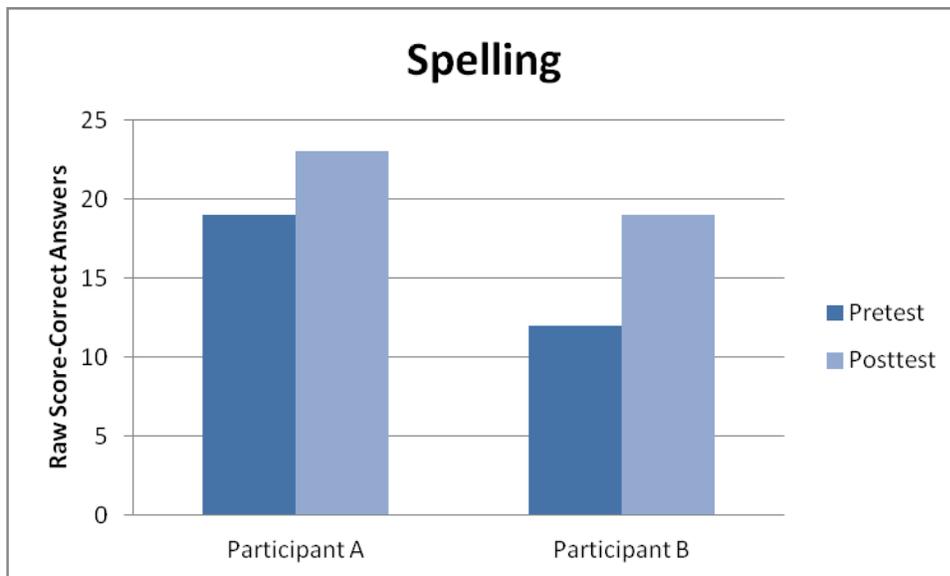


Figure 3.

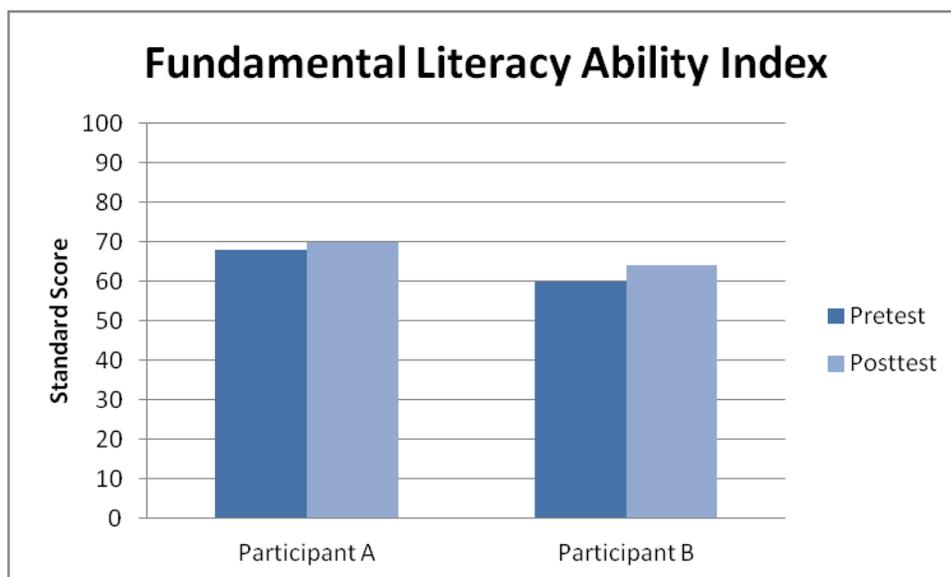


The third area of assessment was Fundamental Literacy Ability Index. This was a composite score of the first and second subtests. It was an indication of overall reading ability.

The scores were given as raw scores and standard scores.

Both participants showed growth overall in the area of Fundamental Literacy Ability Index, see figure 4. The first participant's pretest standard score was 68. Her posttest standard score was 70, an increase of two. Her raw score showed growth. Her pretest raw score was 70 and her posttest score was 89, an increase of 19 correct answers. The second participant also showed growth. She had a standard score of 60 for the pretest and a 64 for the post test. Her pretest raw score was 45 and the posttest score was 71, a growth of 26 correct answers. This indicates that both participants increased their overall ability to read and spell words.

Figure 4.

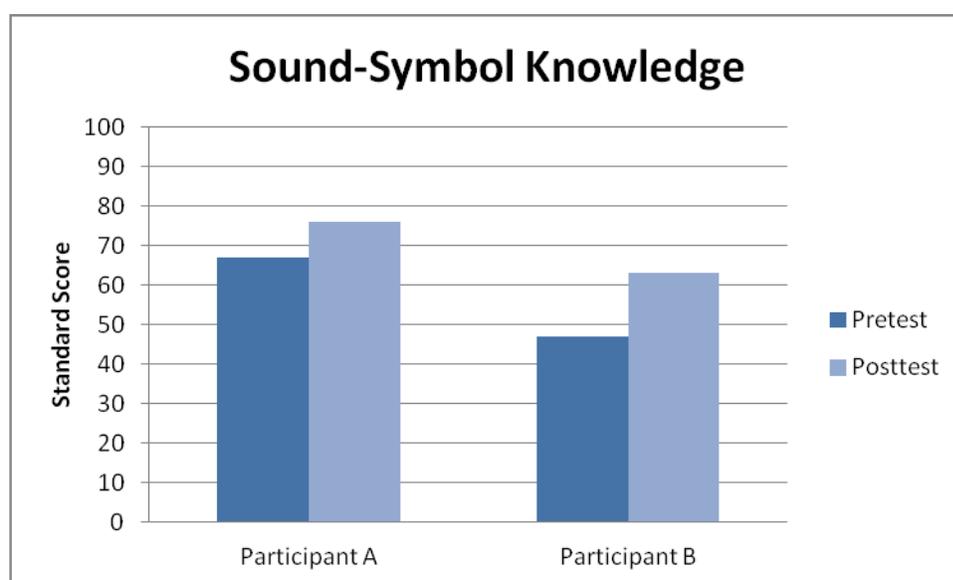


The last area of assessment was Sound-Symbol Knowledge. This involved decoding pseudo words and phonemes. The scores were given as raw scores and standard scores

Both participants showed growth overall in the area of Sound-Symbol Knowledge, see figure 5. The first participant's pretest standard score was 67. Her posttest standard score was 76,

an increase of 9. Her raw score showed growth. Her pretest raw score was 47 and her posttest score was 63, an increase of 16 correct answers. The second participant also showed growth. She had a standard score of 63 for the pretest and a 73 for the post test. Her pretest raw score was 41 and the posttest score was 59, a growth of 18 correct answers. In this area the growth of the participants was the largest of all the tested areas when looking at the raw scores.

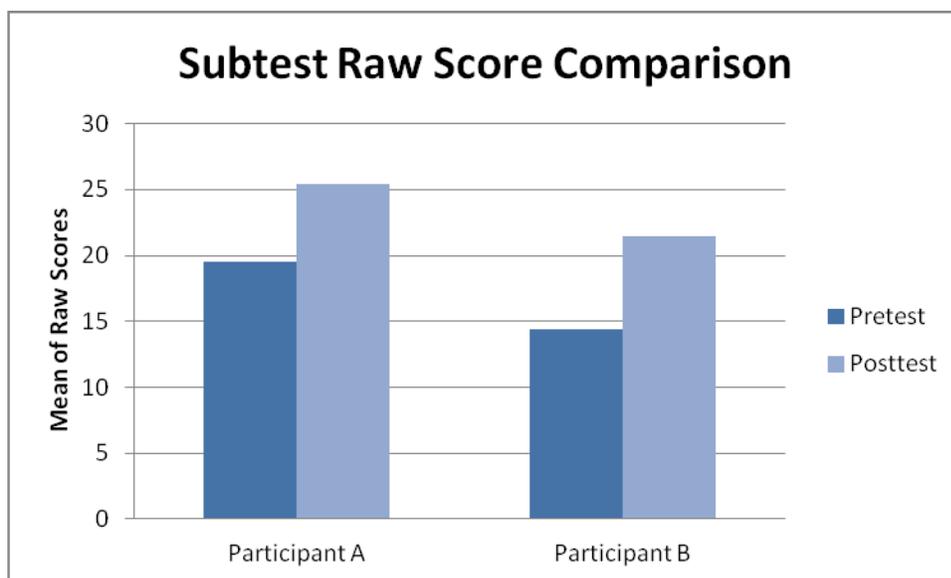
Figure 5.



Participants' raw scores on both the pre and post tests showed that they scored in the very poor or poor category as determined by the WIST test manual. The very poor category scores lie beyond the third standard deviation below the mean. When given the pretest, three out of four of the first participant's scores fell into this category. On the post test she had no scores falling in this area. The second participant had three out of four scores in this area on the pretest and two out of four on the post test. The scores not in the very poor category were in the poor category. The raw scores can be looked at in a different way. The mean of the participants' scores can be determined and compared. The regular and irregular word reading, regular and irregular spelling,

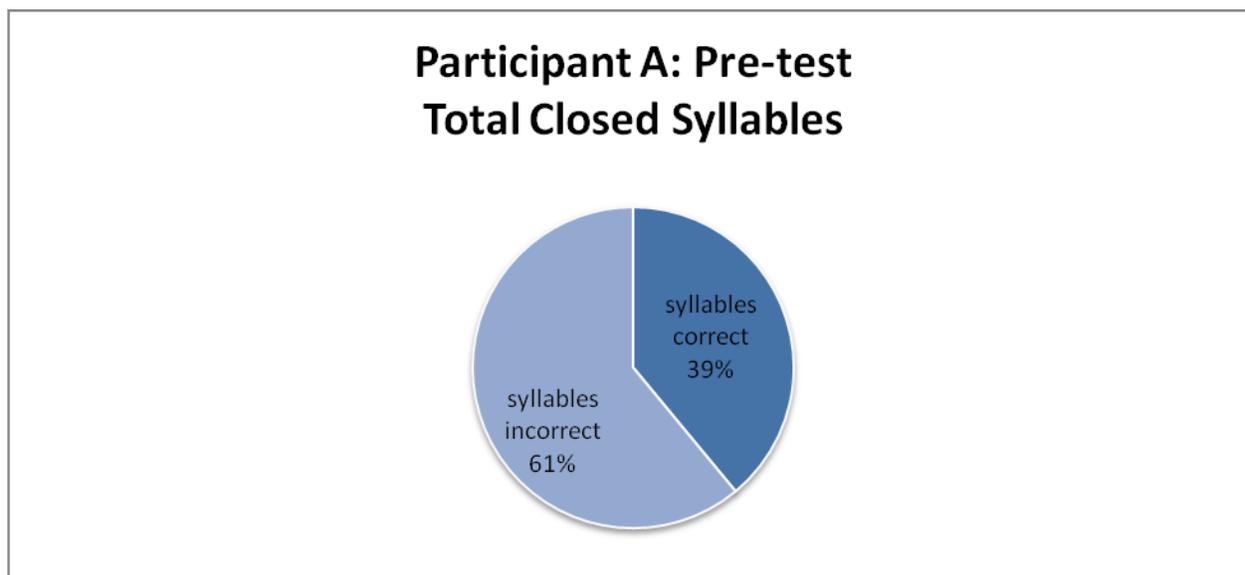
pseudo words and letter sounds subtest raw scores were used to determine the mean. As seen in Figure 6, the mean of the first participant's raw scores went from 19.5 with a standard deviation of 14.15 to and mean of 25.4 and a standard deviation of 19.97. The second participant's mean raw scores increased from 14.4 and a standard deviation of 13.57 to a mean of 21.5 and a standard deviation of 19.14. There was growth for both participants when their raw scores were compared.

Figure 6.



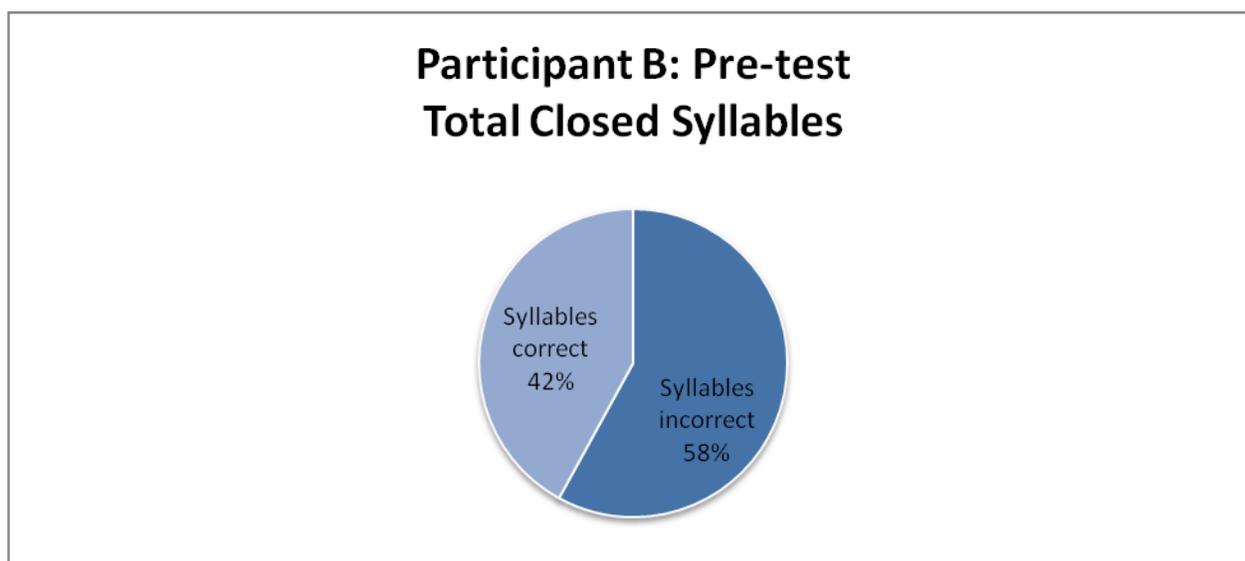
An informal analysis of the types of syllables that the participant read and/or spelled correctly on the pre-test was also done. On the pretest the first participant read and spelled a total of 112 syllables before reaching the ceiling of the test. 35% of the total 112 syllables were incorrect before reaching the testing ceiling. 57% of the syllables presented were closed syllables which contained short vowels. As seen in figure 7, of those 57% she read and spelled 61% correctly or 39% were incorrect.

Figure 7.



The second participant, on the pretest, read and spelled a total of 73 syllables before reaching the testing ceiling. 27% of the total 73 syllables she read and spelled before reaching the testing ceiling were correct. 64% of those syllables were closed syllables with short vowels. Of those 64% she read and spelled 42% correctly, see figure 8.

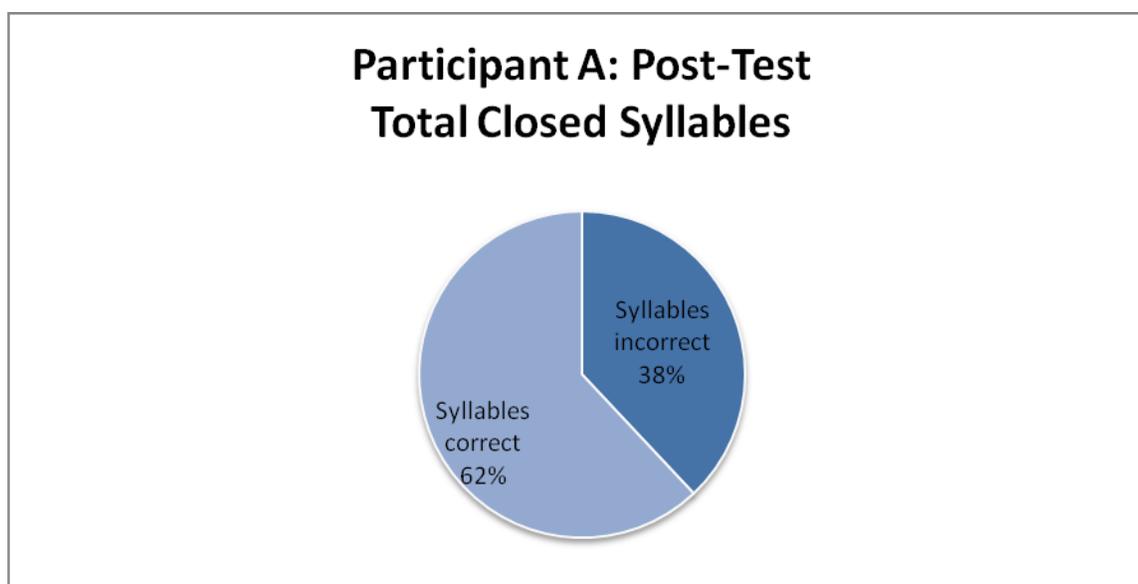
Figure 8.



Other syllable types were read and spelled with varying accuracy; however, closed syllables are used more frequently in reading and writing tasks and if the participants could increase their skill in reading and spelling closed syllables they could increase their overall reading and writing achievement. This analysis was used to guide instruction during the intervention. As a result, it was decided that the intervention would focus on short vowel sounds and patterns including *cvc*, *ccvc*, and *cvcc* patterns.

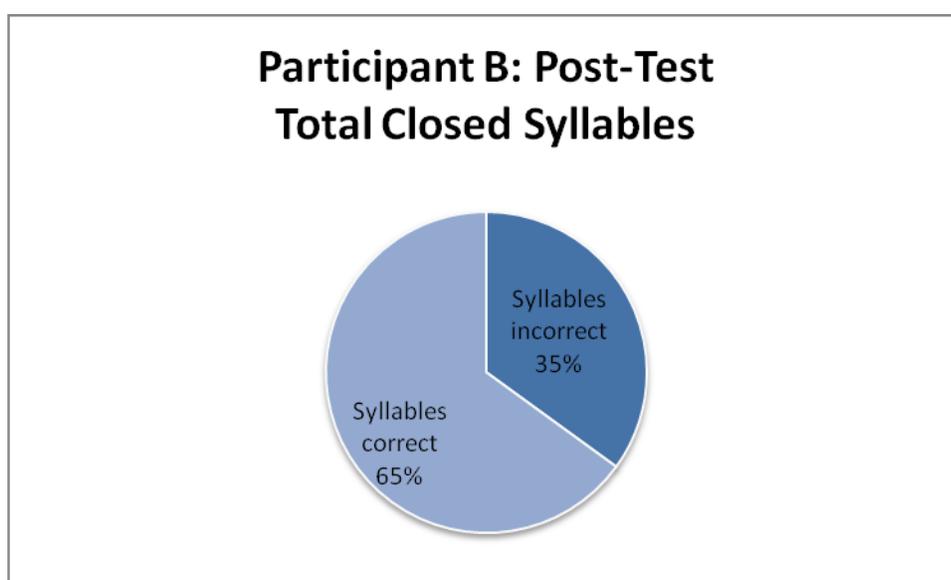
The posttest scores of both participants showed growth. The first participant read a total of 147 syllables before reaching the testing ceiling. 35% of the total 147 were correct. 56% of the 147 syllables were closed syllables. She read and spelled 62% of the closed syllables containing short vowels correctly before reaching the testing ceiling as shown in figure 9. So, she increased the number of total syllables she read and spelled but made virtually the same number of mistakes.

Figure 9.



The second participant also made gains. She read and spelled a total of 102 syllables before reaching the testing ceiling. 59% were closed syllables. She read and spelled 65% of those correctly or 38% of the total 102 syllables before reaching the testing ceiling as shown in figure 10. Not only did she increase the number of syllables read but the percent of correct closed syllables containing short vowels also increased.

Figure 10.



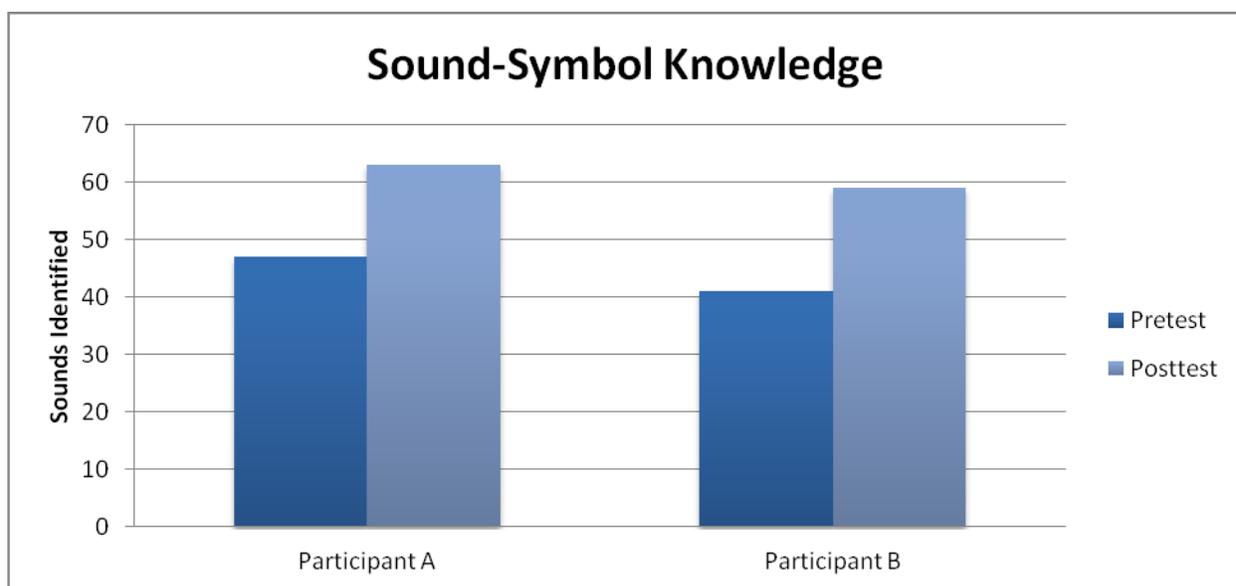
The Sound-Symbol Knowledge subtest can also be analyzed informally. It consisted of two tasks. The letter sounds task assessed the number of phonemes the participants were able to produce when presented with a list of graphemes. The second task was to read pseudo words. Together the tasks are a representation of phoneme awareness.

On the pretest the first participant had a raw score of 47 or 6 pseudo words before the testing ceiling was reached and 41 letter sounds out of a total of 105. When isolating the vowel sounds she stated 5 out of 15 sound correctly. Her posttest raw score was 63 or 9 pseudo words before the testing ceiling was reached and 54 letter sounds out of a total of 105 as seen in figure

11. When isolating the vowel sounds she stated 10 out of 15 correct. The improvement was seen in both the short vowels and long vowels.

On the pretest the second participant had a raw score of 41 or 2 pseudo words before the testing ceiling was reached and 39 letter sounds out of a total of 105. When isolating the vowel sounds she stated 4 out of 15 sound correctly. Her posttest raw score was 59 or 5 pseudo words before the testing ceiling was reached and 54 letter sounds out of a total of 105 as seen in figure 11. When isolating the vowel sounds she stated 10 out of 15 correct. The improvement was seen in both the short vowels and long vowels.

Figure 11.



This research addressed the explicit instruction in phoneme-grapheme relationships and its effect on phoneme awareness, spelling, and word reading of African-American students who came from economically disadvantaged families. These assessments have assessed the participants' abilities before and after the intervention was delivered in these

areas. Based on these findings explicit instruction in phoneme-grapheme relationships had a positive effect on the performance of these participants.

Due to the small number of participants the significance of this study is difficult to determine. Yet, the positive results of this study indicate that further research with a similar, larger group of participants is warranted. Also, the results suggest that a lengthier study over several more months would increase the achievement of the participants.

## Chapter 5

### Summary and Conclusions

#### Interpretation

The results showed growth in general in both participants' abilities to read and spell using phonemes and graphemes as demonstrated by their standard scores and raw scores. This is particularly evident when the closed syllable, short vowel patterns were isolated. While the results of maturation and instruction outside of the treatment cannot be ruled out, their effect was minimal because both participants, identical female twins, were instructed in the same general and special education classes and the specific skills of short vowels were not included during the time of treatment.

The purpose of this study was to determine if specific instruction with phonemes and graphemes would increase the reading and spelling abilities of African-American students with reading disabilities. Based on the results, this treatment had a positive effect on the reading abilities of these participants. Because the participant number was so small these results cannot be generalized to other populations. Nonetheless, further research could be conducted to confirm the results.

#### Implications

The positive effect that was seen in the scores of the participants along with their increased interest and engagement in the activities deserves notice. During the treatment the participants were noticeably engaged and actively participating in the activities. The use of manipulatives to show patterns and represent phonemes kept their attention and appeared game-

like to them. The mapping paper helped them keep their work organized and offered immediate feedback. Activities that allow students to be actively engaged are highly sought by educators. So, this three step process should be considered best practice when teaching phonics.

Previous studies around the development of phonemes and graphemes indicate that reading is developed by acquisition of various skills and readers pass through different stages. Throughout the development of a reader something may stop them from progressing. Several researchers have developed interventions to help students develop missing skills. Also, research indicated that a solid understanding of phonological awareness, letters and sounds are related, were necessary to fully develop reading skills. The intervention in this research combined aspects of several previously developed interventions and based on the participants' positive growth during the time of this intervention, it supports the previous studies.

### **Recommendations**

Several recommendations can be made based on the findings of this study. Interest and engagement in an activity can be increased by using items that keep the students' attention. Manipulatives not only can be used to keep students' attention, but can be used to represent phonemes and graphemes and help the student who learns in more concrete ways to acquire an understanding of those phonemes and graphemes. Many students who struggle to read and spell also have difficulty with organization. The mapping paper helps students to stay organized and to sequence phonemes and graphemes. This strategy is particularly helpful for those who reverse letters.

In the future, a similar study could be helpful in solidifying these findings. A larger group of participants would ensure that teaching graphemes and phonemes is effective across a larger

sample. Also, providing the treatment for a longer amount of time and addressing more than closed syllables would help to confirm the strategy's effectiveness on all syllable types.

## Appendix A

### Record of Scores: Norm-Referenced Assessment

#### Participant A: Pretest

	Raw Score	Standard Score	Descriptive Rating
Read Regular Words	32		
Read Irregular Words	19		
Word Identification	51	64	Very Poor
Spelling Regular Words	10		
Spelling Irregular Words	9		
Spelling	19	75	Poor
Word Identification	51		
Spelling	19		
Fundamental Literacy Ability Index	70	68	Very Poor
Pseudo Words	6		
Letter Sounds	41		
Sound-Symbol Knowledge	47	67	Very Poor

**Participant A: Posttest**

	Raw Score	Standard Score	Descriptive Rating
Read Regular Words	47		
Read Irregular Words	18		
Word Identification	65	71	Poor
Spelling Regular Words	13		
Spelling Irregular Words	10		
Spelling	23	73	Poor
Word Identification	65		
Spelling	24		
Fundamental Literacy Ability Index	89	70	Poor
Pseudo Words	9		
Letter Sounds	54		
Sound-Symbol Knowledge	63	76	Poor

**Participant B: Pretest**

	Raw Score	Standard Score	Descriptive Rating
Read Regular Words	18		
Read Irregular Words	15		
Word Identification	33	51	Very Poor
Spelling Regular Words	4		
Spelling Irregular Words	8		
Spelling	12	71	Poor
Word Identification	33		
Spelling	12		
Fundamental Literacy Ability Index	45	60	Very Poor
Pseudo Words	2		
Letter Sounds	39		
Sound-Symbol Knowledge	41	63	Very Poor

**Participant B: Posttest**

	Raw Score	Standard Score	Descriptive Rating
Read Regular Words	35		
Read Irregular Words	16		
Word Identification	52	62	Very Poor
Spelling Regular Words	11		
Spelling Irregular Words	8		
Spelling	19	71	Poor
Word Identification	52		
Spelling	19		
Fundamental Literacy Ability Index	71	64	Very Poor
Pseudo Words	5		
Letter Sounds	54		
Sound-Symbol Knowledge	59	73	Poor

### Record of Informal Assessment

Participant A: Pretest	Closed	Vowel- Consonant- e	Open	r- Controlled	Vowel Team	Final Stable
Correct	39	2	6	9	7	1
Attempted	64	8	9	17	10	4

Participant A: Posttest	Closed	Vowel- Consonant- e	Open	r- Controlled	Vowel Team	Final Stable
Correct	51	8	7	14	10	5
Attempted	82	14	11	21	13	6

Participant B: Pretest	Closed	Vowel- Consonant- e	Open	r- Controlled	Vowel Team	Final Stable
Correct	20	1	4	4	5	1
Attempted	47	2	6	9	7	2

Participant B: Posttest	Closed	Vowel- Consonant- e	Open	r- Controlled	Vowel Team	Final Stable
Correct	39	1	6	9	5	3
Attempted	60	6	8	15	9	4

## References

- Elkonin Boxes, (n.d.). In Big 5 of Reading. Retrieved from <http://learn.esu10.org/mod/resource/view.php?id=232>
- Gaffney, J., & Askew, B. (n. d.) “Marie Clay,” para. 10-13. Retrieved from [http://www.readingrecovery.org/reading\\_recovery/marie\\_clay/index.asp](http://www.readingrecovery.org/reading_recovery/marie_clay/index.asp)
- Groff, P. (2001). Teaching Phonics: letter-to-phoneme, phoneme-to-letter, or both? *Reading and Writing Quarterly*, 17, 291-306.
- Hanna, P. R., Hanna, J. S., Hodges, R. E., & Rudorf, E. H. (1966). Phoneme-grapheme correspondences as cues to spelling improvement. Washington, DC: U.S. Office of Education.
- Heald-Taylor, B.G. (1998). Three paradigms of spelling instruction in grades 3 to6. *The Reading Teacher*, 51(5), 404-413.
- Jensen, E. (2009). Teaching with poverty in mind: What being poor does to kids' brains and what schools can do about it. Alexandria, VA: ASCD.
- Masterson, J. J., & Apel, K. (2010). Linking characteristics discovered in spelling assessment to intervention goals and methods. *Learning Disability Quarterly*, 33, 185-198.
- Mauer, D. M., & Kamhi, A. G. (1996). Factors that influence phoneme-grapheme correspondence learning. *Journal of Learning Disabilities*, 29(3), 259-270.

- Orton-Gillingham Method. (n.d.) in Reading Horizons At Home. Retrieved from <http://athome.readinghorizons.com/research/orton-gillingham-history.aspx>
- Reading Recovery Lessons. (n.d.). in Reading Recovery Council of North America. Retrieved from [http://www.readingrecovery.org/reading\\_recovery/lessons/index.asp](http://www.readingrecovery.org/reading_recovery/lessons/index.asp)
- Spear-Swerling, L., & Sternberg, R. J. (1994). The road not taken: An integrative theoretical model of reading disabilities. *Journal of Learning Disabilities, 27*(2), 91-103, 122.
- Treiman, R., Berch, D., & Weatherston, S. (1993). Children's use of phoneme-grapheme correspondences in spelling: roles of position and stress. *Journal of Educational Psychology, 85*(3), 466-477.
- Wise, J.C., Sevcik, R. A., & Morris, R.D. (2007). The growth of phonological awareness by children with reading disabilities: A result of semantic knowledge or knowledge of grapheme-phoneme correspondences. *Scientific Studies of Reading, 11*, 151-164.