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Word Families and Decoding by Analogy for Word Recognition

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Word Families and Decoding by Analogy for Word Recognition

By

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A Graduate Field Experience

Submitted in Partial Fulfillment of the

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TEACHING WORD FAMILIES AND DECODING BY ANALOGY FOR WORD RECOGNITION
This Graduate Field Experience
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Abstract

The purpose of this study was to determine if utilizing decoding by analogy through phonograms will increase second grade students' word identification skills. Six second-grade students participate in the seven-week quantitative study. The six students received explicit instruction in phonogram study through decoding by analogy as a method of word attack to read an unknown word. In addition to the explicit instruction, the students had application time during the instruction to write and read the words in the context of literature. A pre-test post-test design helped determine student achievement in recognizing words in isolation with common phonogram patterns. The results indicated that all students increase their word recognition skills. This study raises questions about the best ways to instruct students for rapid recognition of words in isolation or in the context of literature.

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CHAPTER ONE: INTRODUCTION

Introduction

English is an alphabetic language in that letters (graphemes) represent the sounds (phonemes) that comprise the language. Unless children develop an awareness of this alphabetic principal, or unlock the code, their progress in reading will be halted. Developmentally, children also begin to develop a systematic method to decipher letters into an intelligible language or known word. This method is widely known as decoding. The process of understanding letter-sound relationships is vital. However, the best support for decoding and word recognition is through vowel letter-sound relationships (Calwell & Leslie, 2013). The main goal is to support students with multiple strategies to automatically recognize words and maintain the comprehension process.

One way to support automaticity in word recognition is teaching vowel patterns by analogy. Teaching students to recognize words by analogy requires students to use their existing knowledge to decode unknown words. Many researchers have utilized this strategy as a method to analyze children's ability to rhyme, spell, or utilize partial syllables to decode words. Bear, Invernizzi, Templeton, and Johnston (2012) created a word study program to encourage students to explore and examine features of words. This program requires students frequently to analyze words by patterns through many of the developmental stages and create generalizations or rules about words. Few researchers have examined analogous reading as a method to decode words with multiple syllables.

Another way to support automaticity in word recognition is the method of examining errors children make in oral reading. This method is known as miscue analysis. The goal of miscue analysis is to find revealing patterns that might inform instructional planning (McKenna

& Picard, 2006). Miscue analysis has taken many forms over the years, but recent research has suggest that one goal of instruction is to teach multiple methods including decoding, analogy, word prediction in context, and sight recognition (Ehri & McCormick, 2004).

Overview of Project

The purpose of this quantitative study was to examine student errors and to supply struggling readers with an analogy approach to word identification. This would allow students to focus on rapid recognition of an already known phonogram pattern and utilizing the same pattern to read an unfamiliar word. It will examine the effectiveness of phonogram identification as an advanced decoding strategy to read words in pairs and isolation. During October and November, 6 second grade students were selected to receive 30 minutes of explicit phonogram instruction 4 times a week, for 7 weeks. The small group lessons included direct instruction, practice opportunities, including familiar and unfamiliar vowel letter-sound relationships, and recognition of multisyllabic words. Covariance procedures were used to conclude if students' posttest performance differed significantly from pretest performance.

The assessment measures used were 2 subtests from the Phonological Awareness Skills Screener (PASS), 2 subtests from the Qualitative Reading Inventory -5(QRI-5), and one subtest from the Fountas and Pinnell Benchmark Assessment System-2nd Edition (BAS). These assessments were utilized for the pre-and post-test measures. This study aims to answer the question: Does explicit instruction of phonograms through decoding by analogy improve student achievement in word recognition and overall reading? The author's hypothesis is that students will demonstrate growth in word recognition after the seven-week period when instruction was explicitly taught.

The results suggested that phonogram recognition improved the word attack skills of the students tested. While the limitations of the study should be considered, instructional recommendations to deliver phonogram instruction must include components that support patterns being taught through practice with children's literature. The researcher hypothesizes that student will demonstrate the greatest amount of growth when explicitly instructed to use decoding by analogy as a method to read unknown words that match the same phonogram pattern. Therefore, the researcher intends to instruct struggling readers to meet the diverse decoding needs and evaluating which areas showed the most success after analyzing there miscues.

CHAPTER TWO: LITERATURE REVIEW

Reading is not a straightforward process of retrieving words off the page (Schoenbach, Greenleaf, Cziko, & Hurwitz, 1999). It is a complex process in which the reader problem solves to make sense of the text from words and sentences using ideas, memories, and knowledge. Part of this complex process involves reading comprehension. Reading comprehension occurs when students are able to decode the words and can comprehend the language in the text. Often comprehension and meaning is weakened when the reader exhausts efforts to attempt to decode unfamiliar words. Decoding skills, or rapid recognition of all words, are essential to successful reading. The rapid and fluent recognition of words during reading ensures that the reader is able to think about and reflect upon the meaning of what is being read, as opposed to having to allocate the mental resources to decode many words on the page (Chard, Pikulski, &Templeton, 2000). A reader with poor decoding skills is then motivated to avoid reading and their failure to read limits the development of their reading skills and achievement. Developing readers need to be taught to be flexible and strategic in their approach to identifying words. Incorporating explicit instruction in phonemic based decoding skills is the first step to progress struggling readers into proficient readers.

Students miscue words when they are constructing meaning of text. A miscue is any unexpected calling of a word or section of text. Many good readers skip words, substitute words, or mis-call words and still gain a high level of meaning from a text. Miscue analysis recognizes the reasons behind miscues and the information documented is used to further the reading success of the given student. Students use graphophonic clues that have high, some, or no graphic similarity between the word as spoken and as printed. Comprehension is weakened when students are attending too much to decoding or are miscuing frequently. Explicit instructional

strategies are available to support readers decoding, word identification, and meaning-making skills. Instructional strategies utilizing phonograms, or word families provide students with skills to identify words quickly and efficiently while building fluency skills. Wylie and Durrell (1970) reported that children learn words easily by the use of "rhyming phonograms" as opposed to the study of complicated decoding rules with many exceptions.

The purpose of this chapter is to determine the benefits of using a particular form of phonogram instruction called decoding by analogy to enhance the word recognition capabilities in struggling readers. First, analyzing student miscues to study reading behaviors is discussed. Next, phonological processes and decoding skills in learning to read is analyzed. Finally, the utilization of phonograms and decoding by analogy to support decoding skills is reviewed.

Miscue Analysis

There are a number of different decoding strategies students utilize when encountering unfamiliar words. Some strategies include part-word decoding, whole-word decoding, phonological analysis, and analogical decoding (McGuinness, 1997). A part-word decoding strategy occurs when the reader searches for familiar letters, letter strings, and small words within the text, and then rearranges them into something that resembles a real word (Laing, 2002). A whole-word decoding strategy is utilized when the reader recognizes and processes the initial or final letter in the target word to make a prediction for what the actual word is. Part-word and whole word are less successful strategies for word recognition and rely heavily on the use of context to guess unfamiliar words. Phonological analysis occurs when the reader uses information from previously stored letter strings and sound-letter associations to recognize unfamiliar words. This strategy requires the reader to sound out words by retrieving pronunciations for each letter symbol and blending these sounds in a sequenced manner. This

strategy is more effective in decoding unfamiliar words and leads to proficiency in the use of the other strategies. In analogic decoding, the reader learns through experience with the print. The focus is on orthographic patterns in the development of sight word retrieval strategies or direct access to the word's pronunciation and meaning.

Simply requesting a student to sound out a word will not support the learner in using effective strategies to identify words. Miscue analysis requires the examiners to analyze what the student does when they approach an unknown word (Caldwell & Leslie, 2013).Teachers who learn miscue analysis learn to build individual and personal models of reading for their students. By involving the teacher on such an individual basis in the reading process, reading can become an even more rich and complex place for author/reader transaction. Several researchers have conducted studies to examine the types of miscues and strategies that beginning readers use to identify words.

The first study conducted by Laing (2002) analyzed the types of miscues between students with and without language learning disorders and the relationship of the miscues with comprehension performance. The second study conducted by Weber (1970) focused on analyzing errors to predict poor reading behaviors and providing insight into the strategies that readers bring to the reading task. The third study by Savage, Stuart & Hill (2001) provide further evidence to the role of instructors scaffolding errors at a younger age for more accurate reading at a later age.

Laing (2002) conducted a study to analyze oral reading errors to prescribe specific interventions to improve automaticity and efficiency in reading for children with language-learning disorders. The purpose of their study was to investigate and examine reading miscues (errors) made by typically developing children and children who demonstrate below-average

language and reading abilities. The authors hypothesized the following questions. 1) Do children with below-average language and reading performance and typically developing children display similar types of miscues while reading aloud? 2) Do children with average language and reading ability make more grapho-phonemically similar errors and more nonsense-word errors than children with below-average language and reading ability? 3) What is the relationship between the nature of reading miscues and comprehension performance? The researchers collected their data through the administration of four separate assessments, the Woodcock Reading Mastery Test-Revised (WRMT-R; Woodcock, 1987), the Clinical Evaluation of Language Fundamentals-III (CELF-III; Wiig, Semel, & Secord, 1995), the Test of Nonverbal Intelligence-II (TONI-II; Brown, Sherbenou, & Johnsen, 1998), and the Peabody Picture Vocabulary Test-III (PPVT-III; Dunn & Dunn, 1997). The assessments were utilized to categorize students in average or below-average reading and language performance as well as placing students into two performance groups. The first group of students was classified as average reading and language performance, or the non-language learning disordered (NLLD) group. Average readers were identified as children who scored at or above one standard deviation of the mean on the WRMT-R. The second group of students classified as below-average reading and language performance, or the language learning disordered (LLD) group. Below average readers were identified as children who scored greater than one standard deviation below the mean for grade level on the WRMT-R. The study was quantitative in design and there were no independent or dependent variables.

Twenty-two students participated in the study. The gender or ethnicity of the participants was not discussed. The average age of the participants was nine years, one month. Subjects were from third grade classrooms, in two separate Southeastern public schools. Socioeconomic status or demographics of the school or community were not discussed. None of the students in the

study received special education services and/or speech language services. The students were not observed to demonstrate any hearing, visual, or phonological impairments.

After administration of the initial screening assessments, students' miscues were obtained and analyzed from the Gray Oral Reading Test-3 (GORT-3; Weirdholt & Bryant, 1992).   This oral reading assessment required the students to read passage aloud and answer comprehension questions (Laing, 2002). The students in this study read two types of passages, at grade level and a grade level above. A basal for comprehension was established when students answered the five comprehension questions correctly. The students were directed to continue reading stories until the ceiling was reached (three out of five errors) on the comprehension questions that followed each passage. The story at which each student obtained a basal for comprehension was defined as being at grade level. The story at which each student obtained a ceiling for comprehension was defined as being above grade level. The examiner followed along as the student read aloud, and transcribed the miscues. When the student made an error that was a real word, the error was written orthographically above the target word on the examiner's copy. When the student made an error that was a nonsense word, the error was phonetically transcribed above the target word. Oral reading errors were then coded based on a sixteen category miscue taxonomy used in previous research (Gillam & Carlile, 1997; Goodman & Burke, 1973; Weirdholt & Bryant, 1992). The miscues were categorized in the following categories: semantic, function, phonologically similar real word (preserved or removed meaning), nonsense word, morphological, morphological/derivational, addition (preserved or removed meaning), omission (preserved or removed meaning), real word not phonologically similar, real-word errors, graph-phonemically similar real-word errors, graphophonemically similar errors, and graphophonemically dissimilar errors.

Scores were obtained through the percentage of miscue types and percentage of comprehension questions answered correctly. For each student, the percentage of each miscue type was calculated by counting the number of each miscue type and dividing by the number of miscues. The percentage of comprehension questions answered correctly was calculated by counting the number of comprehension questions answered correctly on the GORT-3 and divided by the number of comprehension questions attempted after the basal and ceiling was determined.

The first research question explored potential group differences in the types of miscues made during oral reading. A multivariate ANOVA indicated that the children in the NLLD group made significantly more miscues that were phonologically similar to the text words and preserved the meaning of the sentence [F (1,21)= 6.4, p<.05]. There were no significant differences between groups on any other type of miscue. A multivariate ANOVA was conducted to examine potential group differences in the types of miscues made during the PPVT-III to control for linguistic differences between groups. The test revealed that students in the NLLD group made significantly more miscues that were phonologically similar to the text word and preserved the meaning of the sentence and omitted words that removed the meaning of the text less often than the students in the LLD group. The second research question tested the hypothesis that students with average language and reading ability (NLLD group) make more grapho-phonemically similar errors and more nonsense word errors than the students with below-average reading and language abilities (LLD group). Miscues by students in both groups were likely to have grapho-phonemic similarity to the printed words. Both groups produced about the same percentage of miscues that were grapho-phonemically similar (NLLD=64.6%; LLD=59.2%) to the target text words. Similarly, both groups of students produced similar percentages of miscues

that were real words (NLLD=61%; LLD=68.3%), and nonsense words (NLLD=26%; LLD=15%) although the difference in miscues that were nonsense words was significant (p=.07).

The third research question was designed to examine the relationship between the types of reading miscues made during oral reading and comprehension performance as measured using the percentage of comprehension questions answered on the GORT-3. None of the miscues were positively correlated with another because certain categories were included in two larger categories. The percentage of nonsense-word errors and the percentage of function-word errors were significantly negatively correlated with each other (r=-.48, p<.05). A multiple regression analysis was conducted to determine if a specific miscue type best predicted comprehension performance. The analysis revealed that omissions of words that removed meaning of the text was the best predictor of the number of comprehension questions answered correctly for both groups (r^2=.23, p<.05). The students in the LLD group omitted words integral to the construction of meaning about 16% of the time, whereas students in the NLLD group did around 6% of the time.

The researchers determined that students in the LLD and NLLD groups differed in the types of miscues that they executed while reading aloud. The students in the NLLD group rarely omitted content words and were more likely to produce miscues that were phonologically similar to the text word and preserved the meaning of the text than the students in the LLD group. In previous studies conducted by Gilliam and Carlile (1997), it was suggested that typically developing students made more errors that were grapho-phonemically similar to the text words than did students with speech language issues. This finding was not supported in the current investigation. Students from both groups produced the same percentage of errors that were

grapho-phonemically similar or dissimilar to the text words. The prediction in the current study regarding the relationship between oral-reading miscues and comprehension performance was that grapho-phonemically similar errors and nonsense-word errors would be positively correlated with comprehension performance (Laing, 2002). It was also predicted that grapho-phonemically dissimilar errors and real-word errors would be negatively correlated with comprehension performance. The predictions was not concluded in the current investigation. However, the omission of words that were important to the meaning of the text significantly predicted performance on comprehension questions. Students who omitted content words performed more poorly on answering comprehension questions. The children in the NLLD group rarely omitted content words. Unfortunately, the students who were LLD seemed less proficient at using contextual information appropriately to make guesses at unfamiliar words. The students in the current study's LLD group were less likely to preserve the meaning of the text when they made a guess resulting in a real-word error than were the children in the NLLD group. Both groups made the same amount of miscues that were graphophonemically similar to the text, which indicated that they were attempting to integrate print cues to the same degree. However, the students in the LLD group were less accurate in the simultaneous use of context and print, frequently removing the intended meaning from the sentence. The findings supported the research made by Gilliam and Carlile (1997) that students with language impairments may have difficulty efficiently accessing words from their lexicon that match the print cues they perceive. In a similar study to Laing (2002), Weber (1970) explored types of miscues, the grammatical acceptability, and the attention the reader brought to the task of making meaning of the sentence.

Weber (1970) conducted a study to analyze oral reading errors to provide insight into the strategies readers bring to the task of reading (Weber, 1968; Clay, 1968; Kolers, in press;

Goodman, 1969). The purpose of his study was to determine the correct features of a set of errors

observed in a first-grade classroom and to suggest from their characteristics the strategies that

beginning readers use to identify words (Weber, 1970). The author analyzed oral reading errors

for approximations of the correct response in terms of letters, word structure, grammatical

acceptability, and semantic appropriateness. The author hypothesized that to determine the

sources of information that children use in reading, errors must be analyzed at different levels of

linguistic organization. The author also hypothesized that on each of the various linguistic levels,

an error can be observed to approximate the correct response to a greater or lesser degree of

success. Focusing on the degree to which an error approaches the correct response at different

levels of linguistic organization made it possible to assess children's reliance on various sources

of information at different stages of maturity. The researchers collected their data through noted

observations of oral reading from two different observers. The study was quantitative in design.

There were no independent or dependent variables.

    The sample consisted of twenty-one children, ten boys and eleven girls from a public

school in the Northeastern region of the United States. The median age of the participants was

six years, three months. The socioeconomic status of the school community was comprised of a

mixture of high, middle, and low-income families. Ethnic population of the school or participants

was not discussed. It was also not discussed if any students in the study received special

education and/or speech language services.

    A month after school began, the teacher placed each child in one of five groups on the

basis of the ability to proceed through pre-reading instruction. This was determined based on

teacher observation and discretion. Most of the reading instruction was conducted in small

groups, each proceeding at its own rate. For the purpose of this study, the class was divided into

high and low achievers. The teacher utilized Scott-Foresman's *The New Pre-Primers* and *The New Basic Readers* (Gray, Artley & Arbuthnot, 1951,1956a, 1956b, 1956c) to administer reading instruction to small groups. Supplementary materials were provided for the high group as soon as they completed the first-year basal series and were introduced to one group of the lower achievers as a substitute for the primer and the first reader. During each lesson in small groups from December to June, at least one observer was present completing detailed records of daily reading activities (Weber, 1970). The observer noted the lines read both silently and orally by each child.

Reading instruction was administered by the regular classroom teacher. The teacher followed the instructional outlines of the Scott-Foresman guides. The basic instructional method utilized was whole word identification and then the students read stories silently, aloud, or both that included the new words. If students read the text aloud, then the children were presented with familiar words sometimes in an unfamiliar context. Some letter-sound correspondence instruction was provided during the second half of the year. Consonants in the initial position were presented to the whole class, and some vowel correspondences were presented to the high achieving group. Overall, the children had little opportunity for systematic practice on word attack.

The observer noted as many as twenty-three entries with errors. The errors included identifying the reader, group, and time- period, the spellings of the misread word and the errors, as well as syntactic and semantic decisions. The two scorers divided the errors between them, analyzing sixty percent of the total so that ten percent were double-scored. The reported errors were then analyzed and classified. Words were classified as substitutions, omissions, insertions, and reversals for all the errors collected. Regressions and failures to respond to a word were

omitted as errors on the report. The researchers reported that other factors were influential in shaping the errors. First, it was noted that the children drew the large majority of their erroneous responses from the list of words that they had already viewed in their books. For example, for the word *jump*, the children responded with *run*, *Jane*, and *up*. These words had been presented in the materials when these substitutions were made. Another evident influence on the responses was the style of the sentences in the materials. The children demonstrated through their errors that they expected certain sentence types and turns of phrases. Finally, familiar instances of preservation on a word pattern appeared. For example, when provided two sentences *Jump up, Tim,* the child responded *jump* at the beginning of the next sentence, *up, up, up*.

The total number of errors analyzed in the classification system totaled one thousand, nine hundred and seventy-two. The high group made six hundred, thirty-nine of the errors and the low group made four hundred three. The number of errors made by an individual child ranged from nine to one hundred forty-four. The number of errors made by each of the nineteen children on the recordings during this period (n=218) had a rank-order correlation of .64 (p<.01) with their individual totals throughout the year and a correlation of .56 (p<.01) with those made in class (n=420) during the same months. Although the students in the high group made a majority of the errors, they read far more material than the students in the low group. Substitutions of one word for another covered eighty percent of the total errors reported. The remaining errors counted were divided up equally between omissions and insertions.

Errors were analyzed at the sounds and letters level, word structure level, syntactic level, and semantic level. At the sounds and letters level, the researchers examined the degree to which substitution errors approximated correct responses in terms of letters and categorized errors according to the position where they shared letters with the written word. More than half of the

substitutions had the same first letter as the written word, and almost a third had the same two

first letters. A third of the total also shared the last letter while only fourteen percent shared the

last two letters. Another type of response that was analyzed was the response that differed from

the written word by only one letter, either by substitution of one for another (e.g. c*ome/came*) or

the omissions of a letter in the written word (*e.g.. comes/come*) or the omissions of a letter in the

written word (*e.g. comes/come*).

  At the word structure level, the errors were analyzed with regard to the stem morphemes

that they shared with the written words. Of the one thousand seventy-two errors, one hundred

twenty were found to share stems with the written word, and fifty-three percent of the errors

involved regular inflection, specifically the suffixes /–s/,/-ed/, /-'s/. At the syntactic level, the

errors were analyzed to assess the influence of grammatical structure in shaping the responses. It

would be expected that the greatest number of errors would occur at the beginning of the

sentence where grammatical context is least restrictive. Twenty-two percent of the errors

occurred at the beginning, fifteen percent at the end, and sixty-one percent occurred in other

parts of the sentence. Another approach to analyzing the errors on a syntactic level was to

consider their effect on the grammatical structure of the sentence. A large proportion (ninety-one

percent) of the errors were determined to be grammatically appropriate to preceding context.

Almost two-thirds of these errors were determined to conform to the grammatical structure of the

entire sentence. Grammaticality, graphic similarity, and parts of speech were also part of the

error analysis at the syntactic level. At the semantic level, errors were analyzed with respect to

their appropriateness to the message expressed in the stories. Errors were judged as consistent

with the meaning in the sentence or they were judged as being coherent in the context of the

story. Of the five hundred ninety-four errors judged for semantic appropriateness, ninety-two

percent were determined to be consistent with the meaning of the rest of the sentence. The errors were judged for semantic appropriateness to the part of the story that preceded the error. Two thirds of the six hundred ninety-three errors that were relevant here conformed to the preceding context of the story.

The researchers determined that errors and correct responses seemed to reflect readers' strategies in utilizing available information for recognizing words. Analyzing the features of the errors on the level of letters and sounds demonstrated that children in this particular class used certain parts of the word more often than they did other parts. The better readers approximated the correct responses more closely than the weaker readers, and both groups improved during the year. The analysis reflected the children's learning of sound-letter patterns. However, the analysis on the level of grammatical structure did not indicate that the children had to learn to use the constraints of grammatical structure in reading. Rather, it suggested that the children expected the sentence that they read to imitate the structure of already known language and that they actively used this knowledge while they read. The appropriateness of errors to semantic context also supported that the students transferred their ability for handling spoken language to the reading task. In contrast, Savage, Stuart & Hill (2001) took a different approach to predict later success in analyzing reading behaviors.

The study conducted by Savage, Stuart & Hill (2001) aimed to look at the reading abilities correlated with scaffolding errors. The researchers predicted that if scaffolding errors represent more than just a general measure of a decoding approach, then these errors should predict unique variance in early reading. The research was set up in two studies to investigate the contribution of both scaffolding errors and a measure of full decoding skills (nonword reading) in predicting word reading.

The sample consisted of first grade students beginning at age 6, and then assessed again at age 8. The location of the study was in a primary school in London. However, race, school demographics, socioeconomic status, and gender was not discussed. The study was conducted in two phases. In phase one, the researchers took fifty children from primary classrooms, and assessed reading abilities using the British Ability Scales (BAS) single word reading test (Elliott, Murray, & Pearson, 1983). Children who failed this assessment were then excluded from the study. During phase 2, researchers took forty-three children who participated in the original study and were administered the same single word reading test (BAS).

After administration of assessments at age 6, and again at age 8, the researchers categorized words on the basis of shared phonemes. The error categories were unrelated errors, errors sharing orthographic overlap, errors preserving the initial phoneme, errors preserving the final phoneme, errors preserving both initial and final phonemes, and refusals. The first aim of the study was to see which type of reading errors were correlated with reading ability from age 6 to 8.

In the first study, there was a strong positive correlation between BAS single word reading at age 6 and subsequent BAS single word reading ability at age 8 (Savage, Stuart, & Hill, 2001). In order to further investigate the validity of scaffolding errors, two-and three-step hierarchical regression analyses were performed. To further explore the relation between scaffolding errors, refusals, and word reading, a correlational study was carried out.

The main aim of the second study was to investigate whether scaffolding errors play a role in predicting word reading beyond the known effects of decoding skill measured by nonword reading. The second study was correlational in nature. Children were seen on one occasion and were shown the same CVC words as in Study 1. Children were also shown a

nonsense word reading test and a standardized single word-reading test. There was a strong positive correlation between BAS single word reading at age 6 and scaffolding errors and between BAS single word reading and the nonword and CVC word reading measures.

The aim of the study as a whole was to investigate the relationship between measures of scaffolding and other errors made to CVC words at age 6 and single word reading ability at age 8. In the first study, correlational analyses revealed that the amount of scaffolding errors at age 6 was the only error class strongly associated with word reading at age 8. The second study confirmed that scaffolding errors were not simply an alternative measure of sequential decoding skills. Together, the results provide support for the view that reading development is best characterized as a qualitative change through representations of English orthography. The researchers found the early use of scaffolding errors might therefore be expected to play a necessary but not finalized role in later accurate word reading. One further implication of the results of this study is the justification findings may provide for using reading errors qualitatively to evaluate the existence of productive word recognition processes and thereby to guide interventions. From this view, the frequency with which scaffolding errors occur may represent a readiness-screening device for identifying children at risk of later reading difficulties around the age of six.

Overall, Laing (2002), Weber (1970), and Savage, Stuart, & Hill (2001) demonstrate that different readers utilize different methods to identify unknown words. Miscues were analyzed to demonstrate patterns in oral reading behaviors. A fluent reader requires little attention to the task of word identification. However, a struggling reader utilizes more than one strategy to identify a word if they are familiar with more than one strategy. Therefore, the analysis of miscues

provides educators insight to appropriate interventions and assist struggling readers with decoding, word identification, and making meaning of the text.

Word Identification

Researchers have demonstrated that learning to read words is not a matter of memorizing the visual appearance of each written word. Memorization would place overwhelming stresses on memory (Chard et al., 2000). Rather, learners must make connections between the letters in the written words and the sounds that correspond to those letters. Beginning readers, therefore, need to pronounce a word as they look at the spelling of the word, thinking about the connection between the letters and the sounds. Readers move through different stages of word learning on their journey to proficient reading (Ehri, 1991; Gough & Juel, 1991, Spear-Swerling & Sternberg, 1996). When efficient word identification is in place, students can focus their attention to strategies for more advanced comprehension such as identifying important information, word meanings, and synthesizing information (Leslie & Caldwell, 2012).

The first study in this section, conducted by Ryder, Tunmer, and Greaney (2007) explored the role of explicit phonemic awareness and phonemically based decoding skills for students with reading difficulties. The second study by Swank & Catts (1994) assesses the effectiveness of four measure of phonological awareness to predict decoding abilities.

The researchers explored the role of phonological processes in students learning to read. The purpose of their study was to determine whether explicit instruction in phonemic awareness and phonemically based decoding skills would be an effective intervention strategy for students with early-detected reading difficulties in a whole language classroom. The authors listed multiple hypotheses. 1) Phoneme awareness is fundamental to reading an alphabetic system. 2)

Explicit, systematic instruction in the code relating spelling to pronunciations is necessary for most children. 3) The development of detailed orthographic representations is vital to the automatization of word recognition .The independent variable was the scripted phonemic awareness and alphabetic coding program received by the intervention group. The dependent variables were the results the groups received on measures of phonemic awareness, nonsense word (psuedoword) decoding, context free word recognition, and reading comprehension from the Burt Word Reading Test-New Zealand Revision (Gilmore, Croft & Reid, 1981) and the Neale Analysis of Reading Ability- Revised (Neale, 1988).

The sample consisted of twenty-four, six-and seven-year old, students from four separate second and third grade classrooms. The school's location and gender of subjects was not discussed. The schools population was comprised of students from European, Maori, Pacific Islander, and Chinese ancestry. The socioeconomic status of the school community was comprised of a mixture of middle and low-income families. Eight children in the school of study were listed as receiving special education assistance, but they were not involved in the study.

Students were randomly selected for the intervention and control groups based on scores they received on a standardized test; the Burt Word Reading Test (Gilmore, Croft, & Reid, 1981). After students were placed in groups, they were administered pretests from the Neale Analysis of Reading and the Phonological Awareness Test (PAT; Robertson & Salter, 1997) and the Decoding Skills Test (DST; Richardson & DiBenedetto, 1985). The assessments measured phonemic awareness, phonological decoding ability, accuracy of recognizing words in connected text, and reading comprehension. Following the pretest, the intervention group of students received a series of 56 scripted lessons in phonemic awareness and phonemically based decoding strategies that occurred over a 24-week period, while the control group received traditional

whole language instruction. Students in the intervention group were divided into four

instructional groups and received lessons four times a week, for twenty to thirty minutes. A

trained teacher aide administered the lessons for the first three terms of a four-term school year.

Each lesson was presented in a set format, which included the following components; a

phonemic awareness exercise, a main lesson that focused on teaching grapheme-phoneme

correspondences that were introduced in a specific order, and an activity the reinforced the

learning of the new material introduced in the main lesson. Following the intervention, the

children in the intervention and control groups were administered the Burte Word Reading Test

and the Neale Analysis of Reading Ability.

Data was collected and analyzed from the pre and post- test on the Phonological

Awareness Test, Pseudoword Decoding Assessment, Burt Word Reading Test, and the Neale

Analysis of Reading Ability. The tests selected for this study included measure of phonemic

awareness, phonological decoding ability, context free word recognition, accuracy of

recognizing words in connected text, and reading comprehension. The Phonological Awareness

Test (Robertson & Salter, 1997) was used to measure phoneme awareness. Scoring was based on

number of correct responses for each subtest section. An adapted version of a Richardson and

DiBenedetto (1985) pseudoword decoding assessment was used to measure phonological

decoding. Scoring was based on the number of responses that were pronounced correctly. The

Burt Word Reading Test (Gilmore et al.,1981) was used to measure performance on context free

word recognition ability. Scoring was based on number of correct words read. The Neale

Analysis of Reading Ability-Revised (Neale, 1988) was used to assess word recognition

accuracy in text and reading comprehension skills. Scores were based on reading errors to

calculate a reading accuracy score and reading comprehension was scored based on the total number of correct responses to passage related questions.

The authors determined that the intervention group outperformed the control group on all posttest measures- even though both groups made gains. The posttest mean of the intervention group was higher than the control group in all measures. The effect sizes were 1.71 for the phonological awareness total score, 1.69 for pseudoword decoding, .88 for the Burt raw score, .70 for the Neale accuracy raw score, and .98 for the Neale comprehension raw score. The researchers suggested that the intervention program demonstrated success in achieving its primary goal of improving the phonological awareness skills, decoding ability, and context-free word recognition skills of struggling readers. When the author analyzed the age norms for the Burt posttest scores, they determined that the intervention group performed on average only two months below age appropriate levels, while the control group children performed ten months below age appropriate levels. Two-year interval post data suggested that the positive effects of this intervention program were not only sustained, but had generalized to word recognition accuracy in text. Although the intervention group children performed below average in reading, their scores were within the normal range after two years following the completing of the intervention program.

In conclusion, the study demonstrated that children who do not possess sufficient levels of essential literacy-related skills and are not provided with explicit instruction to strengthen skills in phonological awareness would be forced to rely on ineffective word identification strategies. The goal is for the reader to become proficient in rapidly identifying words. The rapid and fluent recognition of words during reading ensures that the reader is able to process and reflect upon the meaning of what is being read, as opposed to having to allocate the mental

resources to decoding many words on the page (Chard et al., 2000). However, to achieve fluent, automatic recognition of words, developing readers must carefully attend to and process the letters in printed words and the sounds associated with those letters. Similarly, Swank & Catts (1994) sought to find the relationships between phonological awareness to predict decoding abilities.

The study by Swank & Catts (1994) researched that explicit awareness of the speech sound structure of language (phonological awareness) is related to early reading development, specifically decoding. This investigation gathered preliminary data on the effectiveness of four measures of phonological awareness in distinguishing between children with limited and competent phonological awareness, and the effectiveness of these measures predicting decoding abilities.

The subjects chosen were 54 children, 27 girls and 27 boys, from first grade classes in a middle-class elementary school in a Midwestern city. Cognitive abilities were screened using the Test of Non-Verbal Intelligence (TONI) (Brown, Sherbenou, & Johnsen, 1982). Following the screening, four tasks were utilized to assess students' phonological awareness. The assessment included a deletion, categorization, blending, and a segmentation task. These tasks were selected because they represented the various types of sound awareness tasks employed in previous research. Reading measures were also assessed using the Woodcock Reading Mastery Tests-Revised (Woodcock, 1987).

To examine the relationship between measures of phonological awareness, language and decoding, Pearson product moment correlation coefficients were calculated. The deletion, categorization, and blending tasks were moderately related to decoding measures. The phonological awareness tasks were more strongly related to measures of decoding than were

indices of nonverbal intelligence. Another way of examining the relationship between the phonological awareness tasks and decoding measures is to examine the relative performance on these tasks of children with differing decoding abilities. From performing a discriminant analysis, 21 poor and 21 good reading decoders were identified. All four measures of phonological awareness were successful in differentiating good from poor decoders.

The intentions of this investigation was to assess the effectiveness of phonological awareness measures as predictors of first grade decoding ability. The researchers hypothesized that measures of phonological awareness at the beginning of first grade were correlated with measure of decoding ability at the end of first grade. The most important evidence of effectiveness is the utilization of these specific phonological awareness measures. Although decoding ability is only one aspect of reading ability, it is a critical strategy in primary school years. Therefore, utilizing measures of phonological awareness may be employed to identify children at risk for decoding and reading disabilities.

Ryder et. al, (2007), and Swank & Catts (1994) agree that reading is a complex behavior requiring high-level linguistic abilities as well as decoding skills. However, the next studies will investigate other methods of word recognition and decoding methods that have been researched over several years.

Phonograms and Decoding by Analogy

The study of phonograms or word families is not a new idea but it has renewed interest and has been altered as the study of onsets and rimes (Johnston, 1998). Research over the last decade has demonstrated that children are more successful at breaking apart the onset and rime in a word (t-op or st-op) than in breaking the word into individual phonemes (t-o-p) or breaking

the word by the initial and medial sound (such as to-p) (Treiman, 1985). Similarly, Allen (1998) described an instructional framework based upon the use of analogy. Instruction that focuses upon common phonograms or rimes strengthens the ability to use analogy to read new words. One appeal of phonograms is that they offer alternative methods than the traditional synthetic phonics programs in which beginners are expected to sound out or decode new words they encounter in a letter-by-letter fashion. Another reason phonograms strengthen word identification is that the pronunciation of vowels is more stable within a family than across families.

Students can be introduced to phonograms when initial and final consonants are understood. More complex phonogram patterns that began to include silent letters and vowel pairs can be introduced when short vowels patterns are mastered. The implementation of word families at the right developmental stage helps students become better readers and spellers (Johnston, 1998).

The first study in this section conducted by Wang and Gaffhey (1998) analyzed usage and consistency of phonogram with analogous words and nonanalogous words. The second study by Goswami and Mead (1992) explored the successful utilization of phonograms at the rime level or using the initial and medial sounds to identify words. The third study by Canney and Schreiner (1977) examined the relationship that syllabication instruction and phonogram instruction strengthened word identification abilities.

Wang and Gaffhey (1998) investigated the use of analogies in the word decoding of first graders. The purpose of their study was to clarify the results of previous research conducted by Goswami (1986), Goswami and Mead (1992), and Marsh, Friedman, Desberg, and Saterdal (1981) and to determine the helpfulness of clue words in decoding by analogy and the abilities of first graders that may contribute to this strategy. The study addressed several research questions

1) How often do first graders use analogy with appropriate words (e.g. analogous words)? 2) How often do children apply the use of analogies to inappropriate words (e.g. misanalogous words)? 3) What general strategies do children use to decode words? 4) To what extent do three standardized tasks from Clay's Observation Survey (1993) account for the variance in word decoding? The study was quantitative in design. The independent variable was the performance on the three tasks of letter identification, Ohio Word Test, and dictation. The dependent variable was the variations of decoding types on the analogous, nonanalogous, and misanalogous words.

Twenty-three students participated in the study, thirteen girls and ten boys. The ethnicity of the participants was not discussed. Average age of the participants was not discussed. Subjects were from three first-grade classrooms in a suburban school in the Midwestern United States. Socioeconomic status or demographics of the school or community were not discussed. The study did not discuss if any students received special education or any other services. Teachers disclosed, based on their judgment, that all participants were free from sensory, emotional, and behavioral problems. Teachers were directed to rate children's abilities in terms of their reading performance and participation in class. Based on this criteria, teachers identified ten children as poor readers, and the other thirteen participants were identified as average or above-average readers.

The study was conducted during the months of November and December in two separate sessions. In the first session, children were administered three standardized tasks from Clay's Observation Survey (1993). The tasks were Letter Identification, Ohio Word Test, and Dictation. In addition, two word-decoding tasks were used to assess children's use of analogy in word reading. In the second session, children were asked independently to read analogous, nonanalogous, and misanalogous words in a random sequence. Then the students were directed

to read three types of words pair by pair after a brief exposure to the pronunciation of clue words, which were visible to the children during testing. To introduce the tasks, the proctor stated: "I will tell you a word (clue word). Then, I will ask you to read it. This word might help you to read other words. Some of these words are hard. Do your best."

The Letter Identification task was designed to measure a student's knowledge of letters. The children were prompted to identify each letter by providing its name, its sound, or a word that starts with the letter. The Ohio Word Test was constructed using high-frequency words from the Dolch word list. This task included three word lists, each containing twenty high-frequency words taken from a beginning reader's vocabulary. The Dictation task was designed to measure each child's sensitivity to sound-to-letter links. One point is awarded for every phoneme that is correctly represented, even if the word is spelled incorrectly. The two decoding tasks were used to investigate performance in word decoding by analogy. The first task was designed to investigate children's use of analogy in reading words that shared the same rimes and phonograms. Children were directed to read two types of words, analogous words that share the same rimes and phonograms with clue words (e.g.. *band/sand*) and nonanalogous words that share three common letters but not the rimes with clue words (e.g. *band/bean*). The second task, included analogous and misanalogous words, was designed to investigate whether children misused analogy by overgeneralizing its use. Children were instructed to read two kinds of words in six different pairs. Analogous words could be read by analogy but misanalogous words (e.g. *nose/lose*) could not. Both types of words shared similar spelling patterns with the clue words, but pronunciation of one of the pairs words differed from the clue word.

Children's responses to the analogous, nonanalogous, and misanalogous were recorded using a formula. The formula was calculated by using the number of new words read only with

the prompting of clue words was divided by the number of words not known without the

prompting of clue words. The gains on word decoding after a brief exposure to clue words were

analyzed with *t* tests. The erroneous responses for the different word types were analyzed on the

basis of omission, rhyming, and non-rhyming patterns. If a student did not read a word, then that

was coded as an omission. If a child read a word that rhymed with its clue word, then that was

coded as a rhyming pattern.

The authors determined that children performed better on decoding analogous words than

nonanalogous and misanalogous words. The differences between decoding analogous and

nonanalogous words and decoding analogous and misanalogous words determined statistical

significance at the .01 level. There was no statistical significance between decoding

nonanalogous and misanalogous words. Children read more analogous words correctly after they

had been shown and told clue words. The improvement in children's performance on decoding

analogous words after exposure to clue words was determined statistically significant at the .01

level. The performance on decoding nonanalogous words did not improve from exposure to clue

words. Results were also similar for children's decoding of misanalogous words.

The results of the correlation matrix indicated that the Dictation task and the Ohio Word

Test were highly correlated with decoding all types of words. The Letter Identification task was

also highly correlated with decoding of analogous words. To reduce the influence of a third

factor that correlates with both variables, a series of multiple regression analyses were conducted

with decoding of the word types as the dependent variable, and the three tasks (Letter

Identification, Ohio Word Test, and Dictation) as predictors. The three tasks accounts for

seventy-five, sixty-seven, and fifty-two percent of the variance in decoding analogous,

nonanalogous, and misanalogous words. The analysis of regression can be misleading.

Scattergrams and McNemar's test were used to examine the relation between the performance on the Letter Identification task and the decoding of analogous words. Children's erroneous responses in decoding the three types of words were analyzed based on omissions, false rhyming, and nonrhyming. The results indicated that first graders were inclined to use partial letter-sound mapping strategies in decoding all three types of words. Children often guessed a word based on initial or final consonants of the word. Children were inclined to make more rhyming errors when they read misanalogous words compared to their reading of nonanalogous words.

The authors of the study determined that when students were provided rhyming prompts with common phonograms, most first graders used analogous clue words in word identification. The results supported the previous findings that beginning readers find it easier to decode analogous words than nonanalogous words (Ehri & Robbins, 1992; Goswami, 1986; Goswami & Mead, 1992; Muter et al., 1994). However, the accessibility of clue words helped first graders to generalize the sounds to other analogous words. The presence of clue words confused children when they decoded misanalogous words. Over one-third of the errors in decoding misanalogous words were related to overgeneralizing the rules of analogy. This suggested that although children have insights into the use of analogy in decoding unfamiliar words, they might not be able to discriminate appropriate from inappropriate use of analogy. In this study, researchers determined that the Ohio Word Test accounted for considerable variance in the children's performance in decoding misanalogous words. This suggested that children need more lexical knowledge to reduce the misuse of analogy. In a similar study to Wang and Gaffhey (1998), Goswami and Mead (1992) explored the utilization of spelling patterns, phonograms, and analogies at the beginning of the word and the end of the word.

Goswami and Mead (1992) determined which phonological tasks were most closely related to the ability to make analogies between the spelling patterns in words in reading. The purpose of this study was to examine the connections between different levels of phonological skill and the use of analogies between the spelling patterns at the beginnings and ends of words. The researchers hypothesized that the children's performance in phonological tasks based on the onset-rime division should be related to their ability to make analogies between the spelling patterns in words. The study was quantitative in design. The independent variable was the order in of instruction when receiving the experimental sessions. The experimental sessions were based on analogy instruction and some sessions were based on phonological awareness. Half of the students received the analogy sessions before the phonological sessions and the other half received the phonological awareness sessions before the analogy sessions. The dependent variable was the results students received on the Schonell Reading Test (1971) and the Neale Analysis of Reading Ability (Neale, 1999).

The sample consisted of forty- four, six to seven-year old, students. The mean age of the sample was six years, nine months. Gender, location, socioeconomic status, and population demographics were not disclosed. It was not discussed if any students in the study received special education and/or speech language services.

Students were first administered a series of pretests designed to measure initial reading knowledge and vocabulary. First, reading ability was measured using the Schonell Reading Test and the Neale Analysis of Reading Ability. Children were also administered the British Picture Vocabulary Scales-III (BPVS-III; Dunn, Dunn, Styles & Sewell, 1997) to measure vocabulary usage. Next, a test of letter sound and letter name knowledge was administered. The test consisted of separately printed cards in which each alphabet letter was presented. The children

were then requested to provide the name of the letter and its sound. Finally, a test of nonsense words was administered. The nonsense word test contained twenty simple CVC nonsense words utilized from Treiman, Goswami, and Bruck (1990).

Students received instruction for a number of experimental sessions, a few days apart. The duration and time span of administering the experimental sessions was not discussed in the study. Students received experimental sessions in a specific order. Half of the students received the analogy sessions prior to the phonological awareness sessions and half of the students received the phonological awareness sessions prior to the analogy sessions.

In the analogy sessions, clue word analogizing techniques were utilized to assess children's ability to make orthographic analogies. Each child received two different analogy tasks. The tasks were clue words using end analogies and clue words using beginning analogies. Children were instructed in a specific format. First, students were presented a clue word that would help read additional words. Explicit mention on how the clue word might help in the reading task was not provided. A clue word (like *beak)* was presented and the child was provided its pronunciation. The clue word remained visible while the student read six words with the same final spelling pattern or same initial three letters as the clue word. Word set were presented in the same order for each session. This format was utilized for students to read analogies at the beginning (e.g.. *beak, bean, bead,* beat) and end (e.g. *beak, peak, weak, speak*) of the word. Test words were administered during sessions to monitor student progress. The words were analogous in which the words shared the same initial or final three letter with the clue words, and control in which three letters were also common with the clue word, but out of sequence (e.g. *beak, bask, bank, lake*).

In the phonological awareness sessions, students received instruction in a fixed order. The order of instructional strategies was rhyme and alliteration, syllabic segmentation, deletion of initial or final consonants, and phonemic segmentation. In the rhyme and alliteration task, students had to select the "odd word" that had a different initial, medial, or final sound. In the syllabic segmentation task, students were administered bisyllabic words and were directed to state only the first syllable in each word (e.g. *cowboy-cow, pillow-pill*). In the deletion task, students were provided words with the first phoneme or final phoneme missing. In the phonemic segmentation task, students were directed to segment simple CVC words (e.g. *bud, hop, leg*).

The experimental design was utilized to discover whether children who received the analogy sessions after the phonological awareness sessions resulted in more analogies than those receiving the analogy sessions first. Factors that were considered when analyzing results included experience with rhyming and segmenting facilitated analogizing or if the reading level of the student affected analogizing. The researchers examined the influence of the factors and whether orthographic analogies were being made. A 2 x 2 x 2 x 2 x 2 analysis of variance was utilized. Researchers examined order x reading x condition x test x word type. An interaction between test and word type was determined for $F(1, 40) = 49.96$, $p < 0.055$. There were no effects based on the order of the sessions, but there was a significant main effect of reading, $F(1, 40) = 16.52$, at the $p < 0.0001$. Both reading groups demonstrated the same pattern of a significant improvement in reading the analogous words, but no improvement in reading the control words. The results suggested that both ability groups made analogies in the same manner. An analysis of covariance was utilized to control for the differences in pretest knowledge of the words. The analysis was a 2x2x2x2 design. Researchers examined order x reading x condition x word type. Researchers determined highly significant results for analogies being made and word type, $F(1,$

39)=52.77, at p<0.0001. A significant interaction was also found between in making end analogies and word type, $F(1,39)=5.35$, at p<0.03.

The two analyses indicated that there was not an effect on analogizing by receiving the phonological sessions prior to the analogy sessions. The analyses also indicated that there was not a difference in analogizing between the poor readers and the better readers, and the analogies were made between both the beginnings and the ends of words. However, the analyses indicated there was not an end effect in making analogies, with end analogous words read more successfully than beginning analogous words by children at both reading levels.

The researchers hypothesized that end analogies in reading should be strongly linked to a child's ability to categorize words by their sounds. All the phonological measures were related to analogizing, as were the reading scores. Goswami and Mead (1992) demonstrated correlations were informative, a third factor such as age, reading ability, or vocabulary could be responsible for the correlation data. The pattern of correlations indicated that vocabulary was not related to analogizing, but reading (single-word reading) was.

The researchers designed this study to examine the connections between different levels of phonological skill and the use of analogies between the spelling patterns at the beginnings and ends of words. This was supported by the hypothesis that onset-rime awareness was connected to making analogies between the spelling patterns representing the rimes in words. Measures of onset-rime awareness remained significantly related to end analogies even after controlling for reading ability whereas other phonological measures did not. The researchers determined that two kinds of analogies required different phonological skills. End analogies were based on rime units and are strongly linked with rhyming skills. Beginning analogies required children separate the rime when they extracted the common spelling sequences from words. Thus, children only

begin to make beginning analogies once they have begun to read and can segment words at

boundaries other than those of onset and rime. Goswami and Mead (1992), and Wang and

Gaffhey (1998) concluded phonograms at the rime level improved students word identification

skills. Unlike the previous studies, Canney and Schreiner (1977) studied the specific effects of

phonogram and syllabication instruction on students' word attack skills.

Canney and Schreiner (1977) examined the effectiveness of rule-oriented syllabication

instruction as a pedagogical exercise in order for students to decode unfamiliar words. The

purpose of their study was to compare the effectiveness of formal, rule-directed syllabication

instruction with a phonogram identification approach (Jones, 1970) as strategies for decoding

words unfamiliar in printed form. Research that was more recent has examined the value of

teaching by sight, phonogram patterns (Durrell, 1956; Fries, 1963; Wylie & Durrell, 1970) or

syllables (Jones, 1970; Gleitman & Rosen, 1973). The authors hypothesized that learning to

identify syllables in printed words may be more effective than initial decoding strategies for

beginning readers than the isolation of individual phonemes (Canney & Schreiner, 1977). The

independent variable was the syllabication and phonogram instruction administered to the

experimental group. The dependent variables were the results the groups received on the

comprehension, syllabication, blending, and sound discrimination subtests of the Stanford

Diagnostic Reading Test (SDRT; Karlson, Madden & Gardner, 1966), Level I, Forms W (1966)

and X (Karlson et al., 1968) and the results of two stimulus word lists from Carroll, Davies, &

Richman (1971).

The sample consisted of one hundred thirty-seven second grade pupils from three

different public schools in the Midwestern region of the United States. The socioeconomic status

of the school community was comprised of a mixture of middle and low-income families. The

gender of subjects was not discussed. The sample was comprised of predominantly Caucasian

families, although it was not discussed if students of other ethnicities participated in the study.

Intelligence scores were unattainable for the study however, students were administered the

SDRT, Level I, Form W to indicate that the pupils represented a normal range of reading abilities

(Canney & Schreiner, 1977). It was not discussed if any students in the study received special

education and/or speech language services.

A 2 x 3 x 3 (program x reading ability x treatment condition) design was used to assess

the effects of treatment on students' reading performance. To obtain intelligence scores, students

were administered the oral vocabulary subtest of the SDRT. Students were identified as high (22

or more correct responses), average (21-17 responses), and low (16 or below responses) readers.

Eighteen students were then randomly selected from each reading level and were randomly

assigned to one of three treatment conditions- syllabication instruction, phonogram instruction,

or control group. The subjects were then administered pretests to determine their ability to

pronounce thirty stimulus words and their performance on the SDRT subtests for reading

comprehension, syllabication blending, and sound discrimination. Students were provided ten

seconds to responds to each stimulus word before being presented the next word (isolation) or

completing the rest of the sentence (context). Identical procedures were followed for

administration of all pretest measures.

Following pretests, students were administered the experimental instructional programs.

The instruction was administered for two hundred and fifty minutes during a four-week period.

Four instructional groups were established, two syllabication groups and two phonogram groups.

Each group contained three high, three average, and three low performing readers. Ten, twenty-

five minute instructional sessions on syllabic principles or phonogram patterns were conducted

on alternate days. Each group received instruction separately. The subjects participating in the

syllabication sessions were introduced to each of the four rules in separate lessons. The

phonogram subjects were presented three groups of four and one group of five phonogram

patterns in separate lessons. Practice lessons were interspersed between the introduction of new

rules or patterns. Children were directed to read single syllable sight words, to isolate phonemes

associate with a particular graphophoneme pattern in the unknown multiple syllable word. The

control subjects remained in their regular classrooms and studied in areas other than reading. At

the end of the sessions, students were administered the thirty stimulus word list and the SDRT

subtests for reading comprehension, syllabication blending, and sound discrimination.

Data was collected and analyzed from the pre and post- test results including the scores

from the SDRT subtests and the stimulus word lists. The data was analyzed by applying analysis

of variance measure appropriate for a three-way design. Separate analyses were conducted for

pretest scores and for posttest scores on the stimulus word lists (isolation and in context) and on

the SDRT subtests, Level I, Forms W (pretest) and X (posttest) to test for significant group

differences prior to and subsequent to instruction. In addition, analysis of covariance measures

were utilized to determine if any observed group differences on the subtests were attributable to

the treatments administered. A separate analysis of variance was utilized to compare post test

scores on stimulus words in isolation versus stimulus words in context.

The pretest data determined that the blocking dimension-level of reading performance

explained differences among the experimental groups of pupils on the SDRT subtests. Pupils in

the control group performed significantly better than the syllabication and phonogram pupils on

the vocabulary subtest. This was attributed to chance variations in pupil performance. The

analysis of post-test scores indicated that high, average, and low ability readers differed

significantly in the predicted direction on all posttest measure at p < .001. The post-test analysis

of variance suggested that there was not a significant difference between the syllabication,

phonogram, and control pupils. However, from the covariance analysis, the adjusted mean scores

indicated two significant treatment effects. Pupils in the syllabication treatment group improved

significantly more than pupils in the phonogram and control groups on the SDRT syllabication

subtest. Second, pupils in the phonogram group improved significantly more than pupils in the

other two treatment groups on the list of stimulus words in context (X_s=2.78; X_p=3.23; X_c=2.16).

The post-test data suggested that the control group evidenced as much growth over the

instructional period as did the experimental groups. With two exceptions, significant differences

in pupil performance on the post-test measures were a function of the blocking dimensions of

reading program emphasis and reading ability and not instruction treatment. The two exceptions

suggested that pupils in the syllabication group improved more in their ability to answer the

items on the syllabication subtest of the SDRT (Form X), than pupils in the phonogram and

control groups. An analysis of variance to compare pupil scores on the stimulus word list in

isolation with the stimulus list in context indicated that pupil performance on the isolation list

was significantly better than performance on the context list (Isolation: X_i= 4.12; Context:

X_c=2.72; SD=2.72).

The authors determined that intensive instruction in the flexible application of

syllabication rules or the identification of specific phonogram patterns did not improve the word

attack skills or the reading comprehension of the subjects tested. Where treatment differences in

pupil performance were observed, they were slight and did not seem in any way to justify the

amount of time, effort, and emphasis afforded by syllabication or phonogram pattern instruction.

Neither instructional approach led to improved decoding performance regardless of the reading abilities of the students tested.

Overall, the implementation of phonogram and analogy instruction utilizing the rime of the word confirmed the hypothesis that students word identification abilities would improve. There was a noticeable increase in word attack skills and rapid word naming. This supports that students become better readers and better spellers through the utilization of phonograms.

The first section focused on miscue analysis and the pivotal role it represents in the reading and intervention process with students. *Miscue analysis* is an assessment that assists teachers in identify the cueing systems used by a reader and the strategies a reader uses to make sense of a text. Miscue analysis focuses on what the student is doing correctly and incorrectly, so that he or she can learn to build on existing reading strategies. The more explicitly miscues are analyzed the more teachers can target, plan, and create tools to support the reader with comprehension. Teachers should view meaningful miscues (like substituting house for home) as evidence of insufficient decoding skills and not as an end result to be fostered (McKenna and Picard, 2006). Beginning readers often rely on context to compensate for weak decoding where miscue analysis will monitor the progress on relying more on decoding.

The second section focused on the importance of students utilizing multiple word identification strategies to improve the reading and comprehending of texts. Students transition through many phases of word identification until rapid word naming become automatic. Attention must be focused on the pronunciation of the word, and the connection between the sounds and letters. More importantly, without phonemic awareness, phonics and related phonological skills, many children experience significant reading problems (Adams, 1990). A

reader's decoding skills must build on a foundation of oral language and phonemic and orthographic awareness to understand the functions and value of reading (Chard et al., 2000).

The third section focused on utilizing phonograms and decoding by analogy as a word identification strategy. Word families fulfill the desirable goal of reinforcing the integrity of frequent spelling patterns even as they participate in different words. Even for skillful readers, the orthographic representations of words with such overlapping spelling patterns are tightly interrelated in memory (Adams, 1990). When applying research-based reading materials, the materials must present coherent, well-coordinated instruction in reading that includes phonics and reinforces common spelling patterns through instruction with common rimes, which helps children decode by analogy. Instruction should be explicit, intentional and match the ability of the reader.

CHAPTER THREE: METHODOLOGY

Participants

The participants were 6 Caucasian second grade students, 3 boys and 3 girls. This was indicative of the school's population noted in Table 1 below. They were selected from three classes in a public elementary school located in a rural area of the Midwestern United States. Because there were 3 sections of second grade, 2 students were selected from each class, a boy and a girl, so no gender bias was represented in the study. Choosing 6 students allowed for an equal representation from each classroom.   Students were selected prior to the study based on a rating criteria set by the teachers and the researcher in a short meeting. During the meeting, teachers were asked to rate children's abilities in terms of their reading performance based on the Fountas and Pinnell Benchmark Assessment (BAS) (Fountas & Pinnell, 2007), Northwest Evaluation Assocation's Measure of Academic Progress (MAP) universal screening tool, and prior Response to Intervention (RTI) services with the district's reading specialist. Using this criteria, the students were identified as struggling readers. The discussion in the meeting indicated that these students were not meeting most of the benchmark criteria for reading in second grade and most of these students had received services in the past with the district's reading specialist. All participants were free from learning or behavioral disabilities identified by an individualized education plan (IEP).

Table 1.

Student Demographics

Student diversity

	This school	State average
White, not Hispanic	94%	73%
Hispanic	3%	10%
Black, not Hispanic	2%	10%
Asian	1%	4%
Multiracial	0%	2%
Native Hawaiian or Other Pacific Islander	0%	0%

Measures

Phonological awareness. A phonological awareness screening was administered to ensure students' knowledge of rhyming, and onset-rime relationships. Phonological awareness skills were assessed using three subtests of the Phonological Awareness Skills Screener (PASS)-rhyme recognition, rhyme production, and blending of phonemes. The purpose of this assessment was to ensure that students understood the concept of rhyme in order to produce words with similar phonograms during instruction time. Each student is prompted to orally

respond with a question from the teacher. Each subtest requires students to orally respond to three items. In the rhyme recognition subtest, each child was given 3 words, and had to produce the two words that rhymed. (i.e. "I'm going to say 3 words. Tell me which 2 words rhyme, or sound the same at the end: *pat, sat, hill*."). In the rhyme production subtest, each child was asked to produce a word that rhymes with a word presented orally by the tester. (i.e. "Fit, bit, and sit rhyme because they sound the same at the end. Tell me a word that rhymes with *sad*."). The final subtest was blending. In the blending subtest, each child was asked to blend phonemes to make a real word that was presented as isolated sounds or parts by the tester. (i.e. Words are made up of sounds and syllables. I'm going to tell you parts of a word very slowly. Listen carefully so you can put them together to say the word fast. */Pen/-/cil/.*) Scoring was based on the number of correct responses for each subtest. Data for this subtest was not analyzed based on the purpose of administering the test. The purpose was to screen students who would be receptive to phonogram instruction.

Word Decoding Tasks. Two tasks were used to investigate the children's performance in word decoding by analogy. The first task administered to students assessed their ability to read pairs of words based common phonograms. The purpose of this assessment was to analyze students ability to use one word to read another word with the same phonogram pattern. The words on the assessment are common high-frequency words paired with low-frequency words of the same phonogram pattern. A list with pairs of 18 analogous words ranging in difficulty from pre-primer to first grade was assessed from the Qualitative Reading Inventory-5 (QRI-5). Each student was provided with a list of the paired words. The students were asked to look at each word carefully and read it aloud. They were asked to read the pair of words together (i.e. There are two lists of words here. I would like you to read the first word, and then read the one directly

across from it like you would read a story in a book). Testing continued until all words were read. Scoring was based on the number of words read correctly.

The second task, included analogous words with more complex vowel patterns, was administered to investigate if students could read words in isolation that followed common analogous patterns. The purpose of this assessment was to assess students ability to recognize words in isolation that followed common phonogram patterns in literature. Children were asked to read two lists containing 20 words from the Fountas and Pinnell Benchmark Assessment System (BAS). The word lists contained short and long vowel phonogram patterns. The lists contained words that second grade students would commonly see in grade level literature. Testing continued until all words were read. Scoring was based on the number of words read correctly.

Procedures

The study was conducted during October and November of 2014. The students met with the researcher for thirty minutes four times per week for seven weeks. The children were given the PASS, QRI-5 subtest, and BAS subtest prior to the first session. The researcher chose to work with the classroom teacher to develop lessons for students who had difficulty with word recognition. Many of the students chosen often read words by the first letters, and miscued with words they knew started with the same letters. The researcher chose to sequence the interventions by short and long vowel patterns.

The researcher utilized her small group workspace to deliver intervention instruction. The instruction took place outside of the regular education classroom during the students morning literacy block. The participants were unfamiliar with the researcher prior to delivering the pre-

tests. The intervention sessions were divided into three separate instructional sections. The pace

of each session moved quickly, as each session focused on a different phonogram pattern. In

general, the researcher followed the same lesson model for each session. Each lesson began with

a small piece of literature or a sentence for students to observe and practice patterns. Then

explicit language was delivered to the students in the following format:

• Draw attention to the rime in a word that they have probably not seen before, such as the *ake* in

shake. Magnetic letters and letter tiles will be used for demonstration.

• Compare the new to the known. Present shake next to a known word such as make.

• Remove the /m/ from make and in its place substitute the /sh/ in order to spell and say the word

shake. You may want to say, "See, if you know the word *make* is spelled m-a-k-e, then you also

know the word *shake* is spelled s-h-a-k-e." Repeat with familiar words in the same phonogram

family.

The following word families were introduced to students throughout the study; short vowels,

consonants blends (ck, nk), consonants digraphs (sh), long vowels (silent e) vowel digraphs (ai,

ea, aw), controlled r, and endings (ing, ay, est, y, ight). Students were then asked to create more

words following the phonogram pattern. At the conclusion of each lesson, the students wrote the

words in sentences and used the phonogram pattern to read words with multiple syllables. If

time allotted, the researcher read aloud grade level text that practiced the phonogram pattern.

Data Collection

        Data was collected through the administration of pre-and post-tests at the beginning and

end of the 7-week intervention. The phonological awareness assessment consisted of 3 subtasks

that the students were expected to have already mastered. For each assessment item, the

researcher read aloud a set of directions, and asked the student to produce an oral response.

These assessment pieces were only used as a pre-test to ensure student understanding of word

parts. The data from the phonological awareness assessment is not discussed in further sections.

Students were also administered phonogram recognition tasks. For these assessments, the

researcher asked the students to read aloud lists of words that followed common phonogram

patterns. One assessment had two groups of analogous words which would require students to

use one column to read the other. The other assessment required students to orally read words in

isolation that may have been unfamiliar, but followed common phonogram patterns. The

researcher recorded each child's responses on a score sheet with phonetic pronunciations.

The researcher collected information from each pre- and post-test and scored each section

of the assessment with a percentage and anecdotal notes of the incorrect responses. The collected

information was kept in a locked file cabinet to ensure student confidentiality.

This information was entered into a table for future analysis. The researcher compared

pre- and post-test data to determine the effectiveness of the intervention. Children's erroneous

responses were recorded and tracked on assessment forms. The responses were analyzed based

on phoneme omission, vowel substitution, or non-rhyming patterns.

To summarize, the researcher provided instruction in 30-minute sessions lasting

approximately seven weeks. Each session consisted of an individual phonogram pattern lesson

with three instructional components and followed a specific phonogram sequence beginning with

short vowel patterns, long vowel patterns, digraphs, r-controlled, and finally endings (est, er,

ing). Similar explicit instruction was utilized during each session. The researcher collected pre-

and post-test data to assess the ability to use phonogram patterns in common high frequency

words and words with complex vowel patterns. Anecdotal notes and the assessment summaries were analyzed throughout instruction to facilitate the necessary areas for student success.

The pre- and post-tests in Appendix A show the type of questions that were asked of the student. Additionally, the sample lesson plan in Appendix B demonstrates how the researcher instructed students throughout most of the sessions. The lesson focuses on multiple application strategies for students to apply for word study and reading literature. Through these sample pre- and post-tests and lesson plans, the researcher intends to demonstrate the method of instruction that took place. Appendix C shows additional resources that were used during each lesson.

CHAPTER FOUR

Introduction

Action research detailed in the previous chapter sought to determine whether utilizing decoding by analogy would be optimal for student word recall and recognition of complex vowel patterns. The author hypothesized that utilizing decoding by analogy to recognize phonogram patterns would produce the best results in the area of word recognition. In this section, the data collected from the pre- and post-tests is analyzed.

Analysis of Data

In each assessment, the researcher evaluated the ability to recognize high frequency phonograms in pairs, and word recognition in isolation using common phonogram patterns. The researcher charted the results of these evaluations following the completion of all sessions. The pre- and post-tests were administered one-on-one so that the researcher could administer in as standard of a method as possible. The researcher included a percentage score for each section of the test and an overall point total for all assessments administered.

The aforementioned chart is presented in Table 2 below. The table is divided into each subtest of the Pre-and Post-Test measures. The table includes the pre-test score given at the beginning of the sessions, the post-test score given at the end of the sessions, and the difference, if applicable, in scores. Scores that indicated an increase are highlighted in green. Scores remaining stagnant are highlighted in yellow. Scores that indicated a decrease are highlighted in red.

Table 2.

Pre-and Post-Test Individual Section Scores

Test Name	Pre-Test	Post-Test	Difference
Student A			
QRI Reading By Analogy			
List 1	18/18 (100%)	16/18 (89%)	- 11%
List 2	15/18 (83%)	18/18 (100%)	+17%
Phonogram Assessment (BAS)			
List 2	14/20 (70%)	17/20 (85%)	+15%
List 3	11/20 (55%)	18/20 (90%)	+35%
Student B			
QRI Reading By Analogy			
List 1	18/18 (100%)	18/18 (100%)	+/- 0%
List 2	17/18 (94%)	18/18 (100%)	+ 6%
Phonogram Assessment (BAS)			
List 2	17/20 (85%)	18/20 (90%)	+ 5%
List 3	17/20 (85%)	18/20 (90%)	+ 5%
Student C			
QRI Reading By Analogy			
List 1	17/18 (94%)	17/18 (94%)	+/- 0%
List 2	16/18 (89%)	17/18 (94%)	+ 5%
Phonogram Assessment (BAS)			
List 2	18/20 (90%)	19/20(95%)	+ 5%
List 3	17/20 (85%)	17/20 (85%)	+/- 0%
Student D			
QRI Reading By Analogy			
List 1	17/18 (94%)	18/18 (100%)	+ 6%
List 2	15/18 (83%)	18/18 (100%)	+ 17%
Phonogram Assessment (BAS)			
List 2	18/20 (90%)	14/20 (70%)	-20%

List 3	14/20 (70%)	17/20 (85%)	+15%
Student E			
QRI Reading By Analogy			
List 1	17/18 (94%)	18/18 (100%)	+ 6%
List 2	17/18 (94%)	18/18 (100%)	+ 6%
Phonogram Assessment (BAS)			
List 2	15/20 (75%)	19/20 (95%)	+20%
List 3	16/20 (80%)	19/20 (95%)	+15%
Student F			
QRI Reading By Analogy			
List 1	17/18 (94%)	18/18 (100%)	+ 6%
List 2	15/18 (83%)	15/18 (83%)	+/- 0%
Phonogram Assessment (BAS)			
List 2	11/20 (55%)	15/20 (75%)	+ 20%
List 3	15/20 (75%)	18/20 (90%)	+15%

Before the sessions began, the researcher administered the pre-test. The pre-test was administered to each student in an individual one-on-one setting. The percentage of accuracy scores ranged from 55 to 100 on individual word lists. This indicates that the students varied in performance ranges though they were identified as struggling readers. When the researcher began the sessions, the students were instructed using phonograms to identify common short vowel patterns. The instructional sessions moved quickly to long vowels (silent e) vowel digraphs (ai, ea, aw), controlled r, and endings (ing, ay, est, y, ight) based on the anecdotal notes recorded in each session. The researcher noted that students were comprehending the strategy quickly, and students required a challenge with more complex vowel patterns. During each session, the researcher followed the same lesson plan format. The format included students being

asked to read a sentence with several words following similar phonogram patterns, explicit instruction on how to utilize one word to read another word, practice writing the words, and reading words with common phonograms in literature .

At the conclusion of all sessions, the researcher administered the post-test. The accuracy scores represented a range from 70% to100%. A difference in the scores between the pre-and post-test indicated if an increase or decrease occurred. These scores ranged from -20% to +35%. Student A received an 11% decrease in accuracy on one section of the QRI-5 Decoding by Analogy assessment but received an increase in all other subtests. Student B remained stagnant on one section of the QRI-5 Decoding by Analogy subtest and received an increase in all other subtests. Student C remained stagnant on one subtest of the QRI-5 Decoding by Analogy assessment and one subtest of the Fountas and Pinnell Benchmark Assessment System (BAS) phonogram word lists. Student D received a 20% decrease on one subtest from the Fountas and Pinnell BAS phonogram word lists but an increase on all other subtests. Student E showed an increase in all subtest measures. Student F remained stagnant on one subtest of the QRI-5 Decoding by Analogy assessment but showed an increase in all other subtest measures. The post-test measures were administered in a one-on-one setting to ensure standard delivery of the assessments.

Overall, accuracy scores increased for most of the participants. The hypothesis of the study searched for the benefits of using a particular form of phonogram instruction called decoding by analogy to enhance the word recognition capabilities in struggling readers. Table 3 examines each subtest area with a separate point value for each measure. Figure 1 below illustrates overall student growth according to the pre-and post-test data.
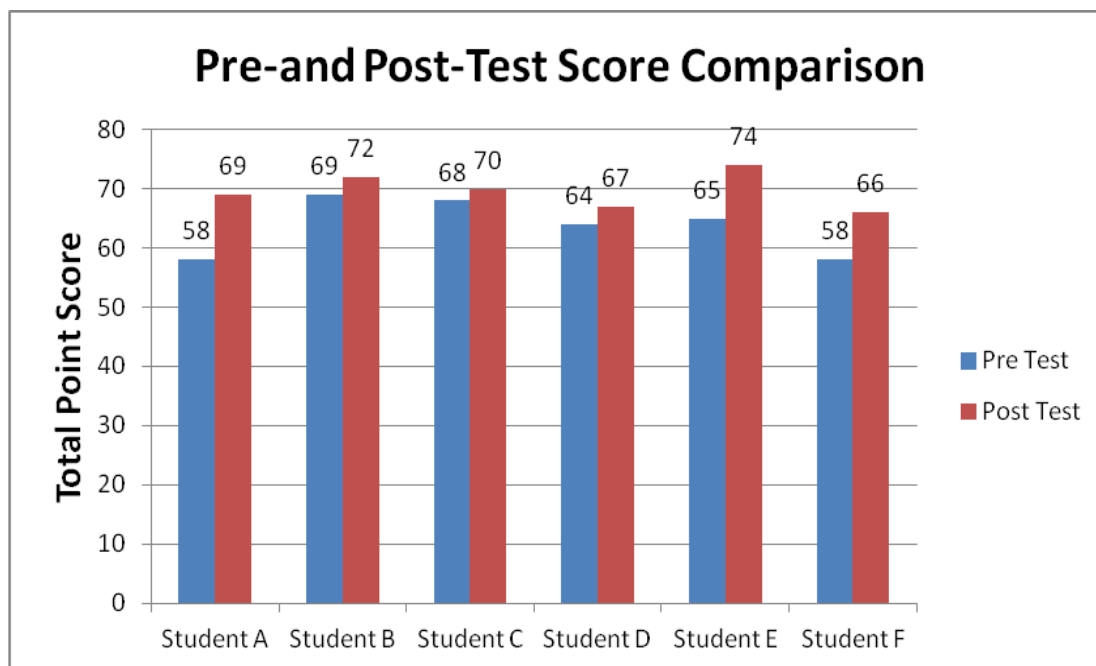
Figure 1. Pre-and Post-Test Scores Overall Point Summary

Figure 1 illustrates overall point growth based on the pre-and post-test. Overall point growth

was calculated by combining the total points available from the four subtest measures. In total,

students could receive 76 points on the pre-test and the post-test. The overall point score mean

from the pre-test was 63.7 and 69.7 on the post-test. Although students may have remained

stagnant or showed a decrease in individual subtests according to Table 3, Figure 1 demonstrates

growth from receiving explicit instruction in decoding by analogy through phonograms to

increase word recognition. The Pearson's correlation formula was used. The coefficient of

correlation (r) is +0.60. The data indicates a positive correlation showing that the explicit

instruction in phonograms allowed for higher accuracy scores in word recognition. However,

there is not a significant correlation at $p<0.05$ level of significance.

In addition to analyzing overall point growth, the researcher sought to compare the results

of the individual assessments against each other. The results provide a different lens into the

performance from the students. The first assessment evaluated the ability to recognize high

frequency words with low frequency words that shared the same phonograms. The word list was

presented in pairs. The second assessment evaluated the ability to recognize words in isolation

using common phonogram patterns. The researcher charted and analyzed the results separately.

The aforementioned chart is presented in Table 3 below. The table is divided into each subtest of

the Pre-and Post-Test measures. The table includes the pre-test score given at the beginning of

the sessions, the post-test score given at the end of the sessions, the mean for each measure, and

standard deviation, and any differences if applicable.

Table 3.

Pre and Post Test Compiled Scores

Measure	QRI-5 Reading By Analogy Assessment 1			Fountas and Pinnell Phonograms Assessment 2		
	Pre Test	Post Test	Difference	Pre Test	Post Test	Difference
Total Points Available	36	36	-	40	40	-
Mean (*M*)	33.17	34.83	+1.66	30.5	34.83	+4.33
SD	1.17	1.33	+0.16	4.14	2.48	-1.66

The table reveals an increase in the average (*M*) scores between both sets of pre-and post-

tests. The standard deviation reveals other results. The standard deviation measures how

concentrated the data are around the mean; the more concentrated, the smaller the standard

deviation. A small standard deviation means that the values in a statistical data set are close to

the mean of the data set, on average, and a large standard deviation means that the values in the

data set are farther away from the mean, on average. However, a larger standard deviation can

reflect a large amount of variation in the group that is being studied. Outliers can also effect the

size of the standard deviation as well as the mean.

On the QRI-5 Reading by Analogy Assessment, there was a small increase in the mean, revealing that there were smaller increase in the scores on the pre-and post-test. Initially, the participants scored percentages in a smaller range on this assessment previously mentioned in Table 3. This data also reveals that the scores were more concentrated around the mean revealing a smaller standard deviation. On the F&P Phonogram Assessment there was a larger increase in the mean from the pre-test to the post-test. Outliers from the pre-test had an effect on the standard deviation size, which in turn, showed the value of the data set farther away from the mean. This assessment revealed a larger distribution of percentage scores contributing to the size of the standard deviation.

The researcher also examined overall point totals for separately for each assessment. Figure 2 below reveals the performance on the QRI-5 Reading by Analogy subtest.
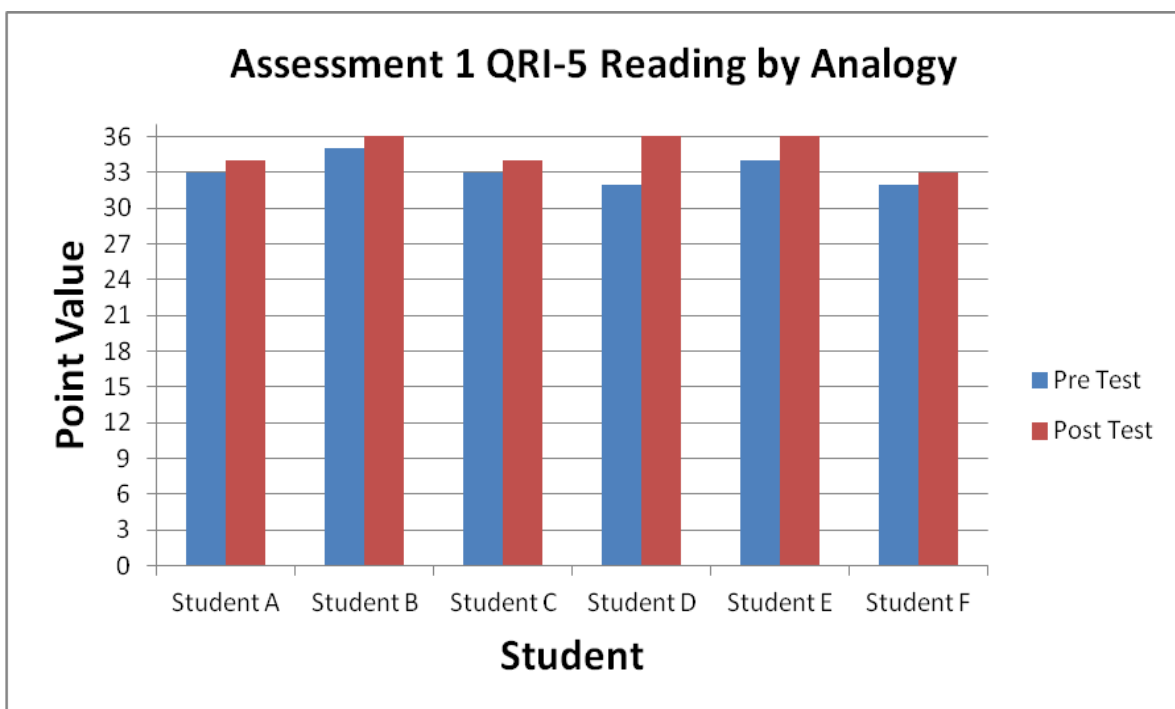

Figure 2. Pre-and Post-Test Results for QRI-5 Reading by Analogy Assessment

In total students could receive 36 points on the pre-or post-test. Scores ranged on the pre-test from 32 to 35 and from 33 to 36 on the post-test. The mean from the pre-test was 33.17. The mean from the post-test was 34.83. Figure 2 additionally demonstrates overall growth from receiving the decoding by analogy phonogram instruction. Figure 3 below reveals the performance on the Fountas and Pinnell (F&P) Phonograms subtest.
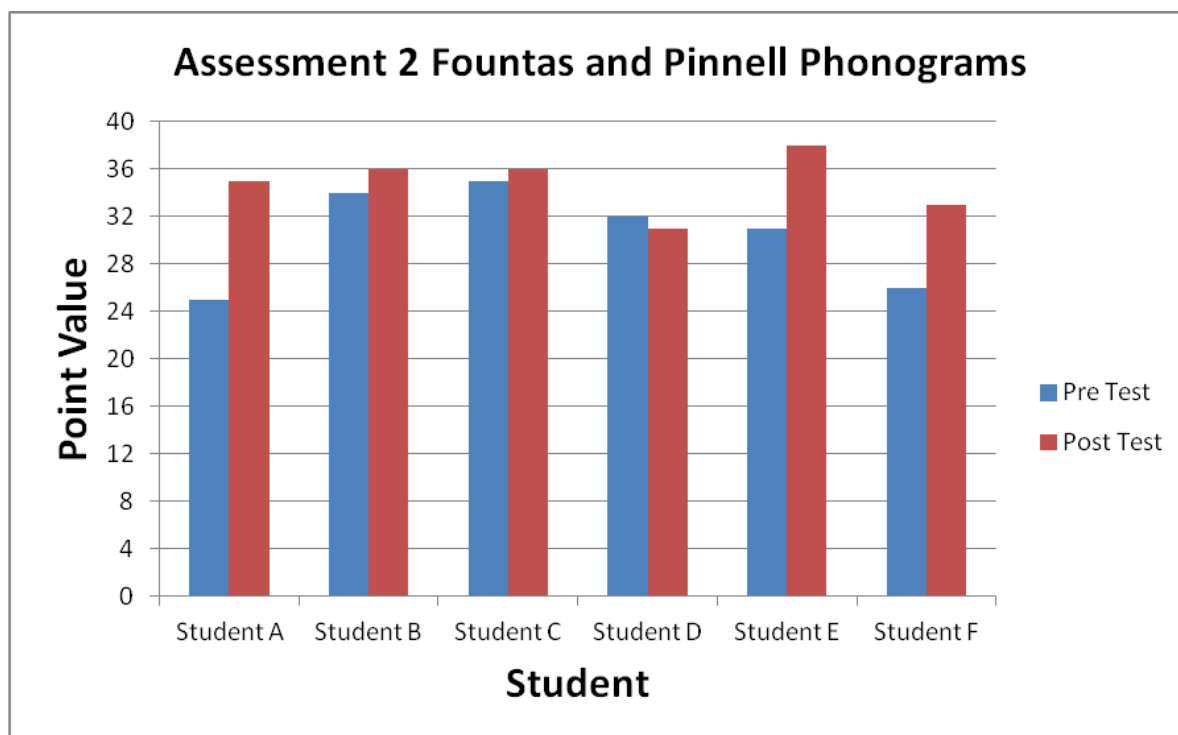
Figure 3. Pre-and Post-Test Results for F&P Phonogram Assessment

In total, students could receive 40 points on the pre-or post-test. Figure 3 demonstrates growth for a majority of the tested population not including Student D. Scores on the pre-test ranged from 26 to 35 and on the post-test ranged from 31 to 38. The mean score from the pre-test was 30.5. The mean score from the post-test was 34.83.

To conclude, the students showed overall growth from the pre-test to the post-test. The author hypothesized that the students would demonstrate an increase in post-test scores following

explicit instruction for phonograms specifically in the area of decoding by analogy. In fact, all students showed improvement when an overall point score was calculated through the four subtests. Two students received a decrease in accuracy scores on one specific subtest measure. Interestingly, each student exhibited a decrease on different subtests. In fact, Student A miscued several high frequency phonograms, but was able to read the second low-frequency word with the same phonogram pattern (i.e. read *lake* for *like* but read *bike* correctly). This contributed to a higher standard deviation for the initial pre-test. Student D exhibited a higher decrease on the BAS Phonogram assessment from omitting phonemes from words or overgeneralizing short vowel patterns (i.e. reading *flak* for *flake,* and *drap* for *drape*).   However, these students demonstrated growth in overall point totals for all the subtest measures. This supports the research that instruction focusing upon common phonograms and rimes strengthens the ability to use analogy to read new words. While this chapter presented and analyzed the results of the intervention, the next chapter will provide connections to research and discuss possible reasons for the outcomes of this study. It will also include strengths, limitations, and implications for future research.

CHAPTER FIVE: FINDINGS AND IMPLICATIONS

Introduction

In Chapter Four, data from the intervention was presented and analyzed. This chapter will discuss connections to the existing research that was presented in Chapter Two. Explanations for the results will be presented, as well as a discussion of strengths and limitations of the study and recommendations for future research. While each student made overall progress, the results were not completely what the researcher hypothesized. This chapter discusses possible reasons for those results and their relationship to previous research.

Connections to Research

In Chapter Two, several articles were reviewed that discussed previous research related to the area of study. While no studies were found that were mirrored of this exact study, many articles discussing decoding by analogy as a strategy to read words and others that discussed the importance of phonological awareness and decoding as strategies for word recognition. The researcher chose to combine the instructional strategy of decoding by analogy to read unknown words in groups or identify unknown words in isolation. This was similarly demonstrated by Goswami (1986; Goswami & Mead, 1992) with implications that supported beginning readers would find it easier to decode analogous words than nonanalogous words when using phonological tasks to read and spell. However, the researcher presented by Goswami & Mead (1992) utilized beginning analogies and end analogies to read words, for example, using a word like *beak* to decode *bean* and *peak*. The study determined student progress connected between the awareness of the linguistic unit of the rime and the ability to make connections between spelling sequences that reflect rimes. In the study by Canney & Schreiner (1976), examiners sought to compare phonogram instruction to rule-directed syllabication instruction as advanced

decoding strategies to improve word attack skills. Canney & Schreiner (1976) suggested that neither syllabication nor phonogram recognition improve word attack skills. In sharp contrast, the study by Ehri & Robbins (1992) argued that Goswami (1986) made it very easy for readers to reveal an analogy strategy by prompting responses through clue words in full view of subjects. Ehri & Robbins (1992) researched beginning reader's capabilities of reading unfamiliar words by analogy to others but looking at whether reading words by analogy require decoding skills to precede this skill. Similarly, this action research analyzed whether weak decoders who miscued words frequently would find more success in decoding by analogy rather than laboring time decoding phoneme by phoneme. However, the research presented by Goswami (1986) fueled most of the research because students were explicitly provided with a word to read another word. Wang & Gaffney (1998) agreed with much of the research presented by Goswami and found that given rhyming prompts with common phonograms, students can use such analogous clue words in word identification. Using this strategy did improve the students overall understanding and performance scores on the assessments.

In addition to phonogram instruction through decoding by analogy, the researcher examined student miscues as a component to accurate and successful word recognition. Analyzing miscues was demonstrated by Savage, Stuart, & Hill (2001) as a way to scaffold students reading errors to improve reading abilities in later developmental stages. They concluded that scaffolding errors might play a role but not wholly sufficient role in later accurate reading. The researcher hypothesized that analyzing student miscues would assist students in utilizing decoding by analogy through phonograms as a strategy to recognize words in isolation. In the study presented by Laing (2002), research was presented to support that the errors children make while reading can be clinically useful. Laing (2002) stated children who omit a sentence's

noun or verb are less likely to be relying on the information contained in the print for reading.

During the study, the instructor attempted to give specific feedback related to miscues that were

analyzed in some of the pre-test assessments. However, it was difficult to apply this strategy

when reading words in isolation rather than reading them in a text. The researcher's main focus

was to analyze miscues on the words before delivering instruction to target successful deciding

by analogy instruction. Miscue analysis was not explicitly analyzed in the methods and results,

but was an important factor in determining instructional needs of the students.

Explanation of Results

The researcher hypothesized that including all three components in instruction would

produce the greatest amount of student success. The data analyzed in Chapter Four demonstrates

that when all the components were included all areas on the post test showed an overall increase

in percentage scores from the pre-test to the post-test. One possible explanation for this is that

the instructor attempted to sequence lessons in an appropriate order as a determination for which

phonograms would be seen most often in text, but in the same amount of time spent time

teaching how to build one word using another in spelling as well. Another possible explanation is

that any given student may have had differing amounts of prior knowledge about a word or topic

than another student during different sessions or utilized other strategies unknowingly while

being tested. The data analysis in Chapter Four also discussed the strength of the correlational

relationship with Pearson's correlation coefficient. While the study indicates a moderately strong

correlation (0.60), it was not statistically significant at the $p<.05$ level of significance. A possible

explanation for this was the presence of outlier scores on the over pre-test percentages. While

correlation cannot imply causation, the event of students receiving the explicit instruction is

associated with utilizing the strategy of decoding by analogy. While this study may indicate that

analyzing a student's miscues was an appropriate method to including decoding by analogy as a method to read words in isolation may not be directly the best option, there were undeniably strengths to the study as well as some limitations.

Strengths and Limitations

The study had both evident strengths and several limitations. One of the strengths of the study was that the assessment was administered at the beginning of the sessions. The assessment could be used as a measure to inform instruction and be responsive to the most common area of deficits in vowel patterns. In this way, if all the students had already mastered short vowel sounds, this information could be used by the instructor to guide the rest of the lesson planning for decoding particular patterns by analogy. Another strength was the explicit instruction delivered in a small group so the researcher could be responsive to students needs right away instead of delivering instruction in a large group. This allowed the researcher to make comparisons across sessions and reflect on daily lessons. Though there were several strengths in the study, there were also limitations.

One of the limitations of this study was having a small group with no control group to make a stronger comparison. Further research with additional participants would be necessary before coming to solid conclusions about this data. Further research would have to compare to a larger control group, or to another program like Words Their Way mentioned in the introduction. Another limitation was that the researcher taught specific phonograms to students in a dictated sequence and left minimal time to applicate the strategy more in grade appropriate texts. Some of the phonogram groups may be considered more difficult than other and one student may have less prior knowledge about rhyming, or a specific phonogram. The sequence of the phonogram

instruction was not based on difficulty. Another challenge that the researcher faced was time. While the lesson were designed for 30 full minutes of instruction, it was difficult to retrieve students from three different locations and bring them to another room to intervene in a quiet environment. Also, the school's instructional calendar limited the sessions from being followed with fidelity in an instructional sequence. It took an extra two weeks to deliver seven full weeks of instructions due to in-service days or holidays. This is a factor that may have impacted how well the material was retained. While there were several limitations to the study, primary findings suggest that more research is necessary to best explicitly instruct students appropriate to identify words in isolation or in a specific context.

Recommendations

Based on the findings of this study, the researcher suggests that further research should be explored on the topic of using miscue analysis to determine whether decoding by analogy through phonograms is an appropriate word identification strategy. Phonogram study has been a highly regarded model of instruction by Goswami for teaching students strategy to identify words other than through laborious decoding. More research should be done based on the individual aspects of this instructional model. Future beneficial research may include instruction on a larger scale that includes more participants of varied genders, ethnicities, and abilities (including students with IEPs). This would yield more accurate results. Additionally, future research should take into account the developmental teaching sequence of phonogram patterns. The assessments should be evaluated and redesigned in order to provide the most accurate depiction of the student's knowledge base. Further studies would improve the instructional methods of classroom teachers and intervention teachers to effectively improve students word identification and decoding abilities.

Conclusion

In conclusion, the results were not specifically what the researcher expected, while there are several possible explanations for these results that warrant future research. This researcher used past and current research and literature to guide the research and instruction with struggling second grade readers. This was to test the hypothesis that miscue analysis is way to warrant phonogram instruction through decoding by analogy to read words successfully in insolation. While the results of the study did not indicate this was statistically significant, there are several possible explanations for these results, which warrant further research. For example, do teachers only focus on one method of decoding or word identification in isolation, and if so, how can it be avoided that one method supersedes another? Ultimately, the researcher believes that students benefitted from this intervention and that the students would benefit from further instruction in how to utilize this while they read difficult, multisyllabic words in context. Any future interventions should consist of multiple research-based strategies in decoding and phonogram instruction. From this research, we learn that often the strategy of rhyming may be taught as an isolated skill and may not be viewed as a method for students to quickly identify a word. While students can understand the concept of rhyme in isolation, it may also be used as a way for struggling readers to quickly identify a word if it shares a common phonogram pattern. Teachers of struggling readers must take all of this into account as they incorporate research-based decoding strategies into their everyday instruction.

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Appendices

Appendix A: Pre- and Post-Tests

Phonological Awareness Screener; Readiness for Instruction Only

Phonemic-Awareness Skills Screening (PASS)

Linda Crumrine and Helen Lonegan

Child's Name _____ DOB _____ C.A. _____ Grade ____

Teacher's Name _____ School _____

School Year _____ Test Date _____ Examiner _____

Sections	Score Possible *20% cutoff*	Scoring: 1 = correct
1. Rhyme	_____ (6) *4*	0 = incorrect
2. Sentence Segmentation	_____ (5) *2*	Child Score: ____ (max 50)
3. Blending	_____ (7) *4*	
4. Syllable Segmentation	_____ (5) *3*	Child Score / 50 = Percent Correct
5. Deletion	_____ (6) *3*	_____ / 50 = _____%
6. Phoneme Isolation	_____ (9) *7*	
7. Phoneme Segmentation	_____ (6) *2*	
8. Phoneme Substitution	_____ (6) *1*	

20% cu. needs instruc.

Before beginning, say, "*Today we'll be playing with words and the sounds in words.*" It is important to administer all practice items, even if the child appears proficient at the task.

1. Rhyme

Recognizing Rhyme
Directions: "*I'm going to say 3 words. Tell me which 2 words rhyme or sound the same at the end: pat, sat, hill*" (child response). If correct, say, "*Yes, pat and sat rhyme because they sound the same at the end. Now try these.*"

If incorrect, say, "*That's a good try, but pat and sat rhyme because they sound the same at the end. Now try these.*"

Item	Correct Response	Score
1. log, him, dog	log, dog	____
2. camp, star, car	star, car	____
3. net, pill, pet	net, pet	____

Producing Rhyme
Directions: "*Fit, sit, bit all rhyme because they sound the same at the end. Tell me a word that rhymes with sad*" (child response). If correct, say, "*That's correct, they rhyme because they sound the same at the end*". If incorrect, say, "*That's a good try, but they don't rhyme because they don't sound the same. Dad, bad, and mad all rhyme with sad because they all sound the same at the end.*"

"*Now try these. Tell me a word that rhymes with each of these words.*"

Item	Response	Score
4. cake	_____	_____
5. nest	_____	_____
6. sun	_____	_____

1. Rhyme Total _____ **(of 6)**

2. Sentence Segmentation

Directions: "Sentences are made up of words. Listen to this sentence: **Birds fly.** This sentence has 2 words: birds fly." (Hold up fingers to represent each word while segmenting the sentence). *"Now listen to this sentence, and hold up a finger for each word in the sentence. Girls are fun"* (child response). If correct, *"That's right. It has 3 words: girls are fun. Now you try these."* If incorrect, explain and readminister the example. (If the child has difficulty, you may use a segmenting board or chips).

Item	Correct Response	Score
1. Lions roar.	2	_____
2. The children have a puppy.	5	_____
3. Kittens chase mice.	3	_____
4. He went swimming in the ocean.	6	_____
5. The wind is blowing.	4	_____

2. Sentence Segmentation Total _____ **(of 5)**

3. Blending

Directions: *"Words are made up of sounds and syllables. I am going to tell you parts of a word very slowly. Listen carefully so you can put them together to say the word fast, **pen-cil** (child response)."* If correct, say *"That's right. **Pen** and **cil** go together to make pencil. Now try this one, **win-dow**."* If incorrect, explain and readminister example.

Item	Correct Response	Score
1. pa-per	paper	_____
2. t-ie	tie	_____
3. c-up	cup	_____
4. m-ake	make	_____
5. n-a-p	nap	_____
6. f-a-s-t	fast	_____
7. s-l-i-p	slip	_____

3. Blending Total _____ **(of 7)**

QRI-5 Reading by Analogy Assessment

Examiner Lists Reading by Analogy

Name _____   Date _____   Level _____

PP1			
High-Frequency Words from the Word Lists	**Correct**	**Low-Frequency Words**	**Correct**
can		pan	
in		pin	
see		bee	
at		rat	
PP2			
make		rake	
same		fame	
like		bike	
place		race	
play		bay	
look		book	
Primer			
keep		peep	
need		seed	
thing		sing	
went		rent	
jump		bump	
First			
sound		pound	
knew		chew	
brain		stain	
Total		Total	

Fountas and Pinnell Phonogram Assessment

*List 2 and List 3 were utilized in this study

Phonograms Assessment—**Individual Record**

Name _____ Grade _____

Directions: Ask the child to read each word. Check (✓) accurate responses and note substitutions.
Calculate the score for each list.

List 1

Date _____

Word	✓
not	
man	
sit	
hen	
pan	
day	
fat	
dog	
nap	
tap	
pig	
net	
tip	
red	
nut	
pin	
sad	
rug	
hop	
jam	
Score	**/20**

List 2

Date _____

Word	✓
shot	
slam	
twig	
when	
drop	
flap	
slit	
sled	
bran	
ship	
shut	
chin	
wet	
plan	
frog	
spray	
that	
plug	
glad	
flip	
Score	**/20**

List 3

Date _____

Word	✓
ate	
mane	
flake	
bite	
sing	
flame	
rag	
plane	
same	
drape	
plate	
drag	
bike	
white	
strike	
slime	
tape	
bring	
rake	
dine	
Score	**/20**

List 4

Date _____

Word	✓
chore	
pile	
dive	
made	
smell	
race	
stale	
cage	
stage	
sale	
space	
hive	
shade	
robe	
while	
poke	
spell	
bore	
choke	
bell	
Score	**/20**

Appendix B: Sample Lesson Plans

Lesson Components	Materials/Strategies in Lesson	Student Observations/ Lesson Reflections
1. Review Phonogram Family from Day Before		Observations/Reflections:
❑ Reread	Reread sentence created by students that follow phonogram pattern.	
❑ Spell	Highlight spelling pattern in the words that were written.	
2. Introduce New Phonogram Pattern		
A. Read Aloud sentence	Student were introduced with a sentence. The sentence has a least two words inside that contain the same phonogram pattern. One known, and one unknown. Today's pattern –*ight* -Read sentence aloud to students modeling how one word can be used to read the other word. *The night light was at the same height as my bed.*	Observations/Reflections:
B. Explicit Instruction	-Draw attention to the rime in a word that they have probably not seen before, such as the /*ight*/ in *slight*.. Magnetic letters and letter tiles will be used for demonstration. -Compare the new to the known. Present *slight* next to a known word such as *night.* -Remove the /n/ from night and in its place substitute the /sl/ in order to spell and say the word slight. You may want to say, "See, if you know the word *night*, then you also know the word *slight*."	
C. Students Make Words	Students offer words and demonstrate how to manipulate with word tiles.	Observations/Reflections:

	Then students pick a few and write them in sentences. -fight -might -flight -bright -tight -ETC….. -right	
3. Read Aloud Text with Phonogram Pattern		
❑ Read Aloud ❑ Shared Reading ❑ Read Multisyllabic Word	Read aloud book <u>Sleepy Ella</u>. Students point out words they found/heard with phonogram pattern. Ask students to read challenge words with same phonogram: 1. twilight 2. delight 3. limelight 4. overnight	**Observations/ Reflections:**

Appendix C: Materials