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## CHUNKING MULTISYLLABLE WORDS INTO WORD PARTS TO INCREASE READING FLUENCY AND SPELLING ACCURACY

Joan Muriel Hutchinson

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CHUNKING MULTISYLLABLE WORDS INTO WORD PARTS  
TO INCREASE READING FLUENCY  
AND SPELLING ACCURACY

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A Thesis  
Presented to  
The Graduate Faculty  
Central Washington University

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In Partial Fulfillment  
of the Requirements for the Degree  
Masters of Education  
Master Teacher

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by  
Joan Muriel Hutchinson  
May 2003

# ABSTRACT

## CHUNKING MULTISYLLABLE WORDS INTO WORD PARTS TO INCREASE READING FLUENCY AND SPELLING ACCURACY

by

Joan Muriel Hutchinson

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The purpose of this study was to examine the statistical significance between the instructional strategies of the REWARDS program and a control group by teaching word chunking, or multisyllablism, to increase struggling middle school readers' decoding, reading fluency, and spelling accuracy. An experimental design of pretest, intervention (REWARDS), and posttest with non-random groups, including a control group, was utilized. The study included three teachers and 23 sixth and seventh graders from two middle schools to test the null hypothesis. The null hypothesis was accepted, not rejected, which used five separate *t*-tests to statistically prove significance in the areas of decoding, reading fluency, and spelling accuracy. Although gains were made in decoding and spelling accuracy, a larger sample size and further research is needed. A different method of research to increase reading fluency is needed because no gains, and even temporary losses, were demonstrated in the experimental group.

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# CHAPTER I

## THE PROBLEM

### Statement of the Problem

The reading wars should be over! Are children learning to read? This should be the question asked by any educator, and if the majority of the students are not learning to read, other methods to teach students to read must be sought. Palmaffy (1997) referenced the study of the 1994 National Assessment of Educational Progress that found over 40% of fourth graders could not read at a basic level. The students could neither understand the meaning of, nor make simple inferences from the text they read. Palmaffy further stated that there are millions of Americans that struggle with limited reading abilities due to educators either ignoring or not knowing the research that has existed on how to teach children to read.

Dr. Ried Lyon (1997), in an article adapted on his testimony before the Committee on Education and the Workforce in the U.S. House of Representative on July 10, 1997, reported that about 50% of most children learn to read no matter what type of classroom and reading instruction they receive. Lyon further revealed that for the other 50% of the children, learning to read is a formidable challenge. About 20% to 30% of children find learning to read one of the most difficult challenges they will ever master in their lifetime.

Reading research has come a long way in understanding how a good reader reads. What is now being researched is why certain students continue to have difficulty learning to read. The study on phonological awareness by Fox and Routh (1974) suggested that

phonological processing appeared to explain the greatest amount of variance between good readers and poor readers. This was supported by a synthesis of research on phonological awareness in thirteen primary studies (Smith, Simmons, & Kameenui, 1995). Phonological awareness is a component of phonological processing and involves the ability to detect and manipulate sounds.

Smith et al. (1995) explained that more than just phonological awareness is needed to become a good reader. A person must process sounds or words at a high enough speed to make understanding of what is read (May, 1994). A good reader must have a high frequency vocabulary, a sight vocabulary, or a verbal memory so that words have an automaticity of recall. Once a word has been decoded, the student's memory must recall that those letter symbols represent a particular spoken word (Scarborough, 1998).

In the last few years, there has been a resurgence of explicit phonic instruction within the whole language classroom for the primary grades. However, in a report, P. Cunningham (1998) contended that phonics instruction stopped around the second grade when most of the words are still single syllable. Yet, Nagy and Anderson (1984) state that students from the intermediate grades and beyond will be exposed to at least ten thousand new words each year. Most of these new words will be multisyllable and students need strategies to decode, gain meaning from, and spell these words. Should educators begin teaching code-emphasis skills to middle school students who have never been exposed to this process or to students who have not mastered decoding? And, if



code-emphasis skills should be taught, what is the best method for teaching middle school students with reading difficulties these skills?

### Purpose of the Study

As special education teachers review this plethora of research, there continues to be a gap in the literature regarding explicit reading instructional strategies for struggling middle school students with reading disabilities. Very little is known about how students decode large words and even less is known about how to teach children about them (P. Cunningham, 1998). Even though these students are in the sixth grade and up, many still read two or more grade levels below what they should be reading as measured by the criteria for their disability category. Much literature exists in how to teach phonemic awareness and phonics to primary grade children (Blackman, Ball, Black, & Tangel, 1994; A. Cunningham, 1990; Smith et al., 1995; Snider, 1995; Yopp, 1992). The dilemma, according to P. Cunningham (1998), is the need to teach students how to spell and decode multisyllable words or big words—words consisting of seven or more letters with two or more syllables.

Therefore, the purpose of this study was to examine, in middle school students with reading difficulties, the significance of an instructional strategy for decoding multisyllable words. The research was guided by three questions: (a) Does this strategy increase decoding skills in multisyllable words? (b) Does this strategy increase reading fluency? (c) Does this strategy increase spelling accuracy in multisyllable words?

## The Research Question

Archer, Gleason, and Vachon (2000) developed a program called *Reading Excellence: Word Attack and Rate Development Strategies*, acronym REWARDS, to teach an overt and a covert strategy to decode and spell multisyllable words by “chunking.” Chunking is breaking large words into two- to four-letter sections, identifying the vowel sound in each section, and then saying each section until the word is identified or decoded. Their program was developed for students in the fourth to twelfth grades who read between the second and sixth grade levels. This program has been used in both the general education setting and with remedial reading classes. The specific research question is: What is the effect of teaching the strategy of word “chunking,” in middle school students with reading disabilities, on decoding multisyllable words, reading fluency, and spelling accuracy, when compared to a control group?

## Null Hypothesis

There is no statistical significance in achievement between middle school students with reading disabilities, in multisyllable word decoding, reading fluency, and spelling accuracy, when taught a strategy for “chunking” multisyllable words, when compared to a control group that is not taught the strategy.

## Definitions

The following word definitions are offered to facilitate a shared understanding of the technical words used in this thesis. In addition, definitions of words will also be embedded within the text to help clarify meaning.

*Accuracy*: Condition or quality of being true, correct, or exact (Stein, 1971).

*Affix*: A word part attached to a base word, stem, or root, such as a prefix or suffix (Bear, Invernizzi, Templeton, & Johnston, 1996).

*Alphabetic understanding*: Understanding that letters represent sounds and that whole words have a sound structure consisting of individual sounds and patterns of groups of sounds, the combinations of alphabetic understanding and phonological awareness becomes the larger construct, alphabetic principle (Smith et al., 1995).

*Automaticity*: Quality of fluency; implies automatic level of response with various tasks, such as speed of retrieving a sound for a specific letter (Smith et al., 1995).

*Chunking*: The process of dividing multisyllable words into two- to four-letter sections, identifying the vowel sound in each section, and then saying each section until the word is identified or decoded (Archer et al., 2000).

*Decoding*: Translating individual letters and or groups of letters into sounds to access the pronunciation of a word (Smith et al., 1995).

*Fluency*: Not a synonym for sheer speed in reading, but the ability to read with enough speed to comprehend what is read; not reading word by word but with natural sounding phrases (May, 1994).

*Grapheme*: A letter or letter combination that represents a single speech sound (Lindamood, P. C. & Lindamood, P., 1998).

*Morpheme*: A sound or syllable that signals or changes meaning (Lindamood, P. C. & Lindamood, P., 1998).

*Multisyllable*: Words with more than one syllable; for this thesis a syllable is a chunk of a word that has only one vowel sound (Archer et al., 2000).

*Multisyllablism*: The act or practice of dividing words with more than one syllable into chunks to decode the word.

*Onset*: The onset of a single syllable or word is the initial consonant(s) sounds (Bear, Invernizzi, et al., 1996).

*Orthographic*: Having to do with the written form of words; the way words are symbolized by using the alphabet (Lindamood, P. C. & Lindamood, P., 1998).

*Phoneme*: Individual sounds, smallest unit of sound (Smith et al., 1995).

*Phonemic awareness*: Awareness of phonemes, discrete individual sounds that correspond to individual letters (Smith et al., 1995).

*Rime*: A rime unit is composed of the vowel and any following consonants within a syllable (Bear, Invernizzi, et al., 1996).

*Word sort*: A basic word study routine in which students group words into categories (Bear, Invernizzi, et al., 1996).

### Limitations

This study can only be generalized to middle school students with learning disabilities in reading, which live within the researched Central Washington school

district. The length of the study from the pretest to the posttest could have been a factor in students' lack of reading fluency gains, in that there was no time to actually use the covert strategy over time to increase reading level and fluency. It would be interesting to see the rate of reading fluency gain from the previous fall, prior to REWARDS, with the next fall's reading level scores after students have been able to internalize the strategy for a year.

A third limitation of the study was the possibility of inconsistency in presentation of the material due to three different teachers presenting the material and administering the pre/post testing. Even though the material taught was scripted, individual differences existed, in deciding if mastery was gained and what was an acceptable time for decoding the multisyllable words on the pretest and post test. Some gave as much time as the student wanted, while others would have the student move on after a few seconds.

The last limitation was the selection of students for the treatment group and the control group. Since this was a true classroom situation it was up to each teacher to select who got treatment and who was part of the control. Was need for decoding skills a determinate for which group the student was placed?

### Overview

In Chapter One, a basic premise for teaching decoding skills of multisyllable words explicitly has been established. This premise was explored in much further detail in Chapter Two, including research supporting how to teach decoding of multisyllable words. In addition, Chapter Two will include the basic stages of reading and spelling development which a learner progresses through, reading and spelling connections, other

studies on teaching multisyllablism, suggested best practices on how to teach multisyllablism, and why REWARDS was selected for this study.

Chapter Three spells out in detail the experimental design of non-randomized groups utilizing a pretest-posttest method for statistical comparison. The subjects for this thesis were selected from two middle schools in a Central Washington school district. The 23 subjects selected were sixth and seventh graders who were enrolled in special education classes for reading difficulties or disabilities. There were nine measurement tools used to compare pre/post and generalization tests in decoding skills, reading fluency, and spelling accuracy. Teacher training was detailed as well as instructional procedures.

In Chapter Four, the *t*-test was utilized to determine the statistical significance of the data collected from the study. Of the five *t*-tests calculated, four of five demonstrated no significance ( $p > .05$ ). There was a probability of error rate from .39 to .09 for the four *t*-tests that included the pretest to posttest reading decoding, the pretest to generalization reading decoding, the reading fluency, and pretest to posttest spelling accuracy. The only *t*-test that demonstrated an error or probability of less than .05 was the pretest to generalization spelling accuracy test ( $p = .002$ ).

Chapter Five includes an interpretation of results, a conclusion, as well as recommendation and interpretations. As a result of the data analysis from Chapter Four, the null hypothesis was accepted. Possible reasons for acceptance of the null hypothesis were too small of a sample size to truly use statistical analysis appropriately and there was not enough time between finishing the twenty lessons of REWARDS and posttest or

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

Does teaching a strategy of “chunking” multisyllable words to middle school students with reading difficulties help increase reading decoding, reading fluency, and spelling accuracy? New research today is advocating for continued teaching of reading and spelling skills to students well beyond the primary years (Archer et al., 2000; P. Cunningham, 1998; Gentry, 1982). Goswami and Bryant (1990) contend that how children spell influences how they read, and how they read influences how they spell. There is a cause and effect relationship in both directions for spelling and reading. This emerges after about two years of instruction when children begin to connect spelling and reading. There is a time and a place for multisyllable instruction, which must begin when the learner is at that stage of development in learning to read and spell.

In this review of the literature a brief understanding of the developmental stages of reading and spelling in the learner, and how reading and spelling are connected will be discussed to facilitate understanding of the following questions. Why do students need to know how to decode multisyllable words? What does the current research suggest about how and when to teach multisyllablism? What other studies exist on the subject of teaching multisyllablism? And lastly, why was the REWARDS program selected as an appropriate strategy for decoding multisyllable words, increasing reading fluency, and increasing spelling accuracy?

## Stages of Reading and Spelling Development

### *Stages of Spelling Development*

Bear, Invernizzi, et al., (1996), Bear, Truex, and Barone (1989), Gentry (1982), Henderson and Templeton (1986), and Rees and Rivalland (1994) outlined five stages of English orthographic development, or more simply known as spelling development. Each gave the title of the five stages somewhat different names but the characteristics of the speller within each stage were described similarly. While others named each stage, Henderson and Templeton (1986) just described the stages and called them stages I-V.

The first stage of spelling development is called Preliterate, Prephonetic Precommunicative, or the Preliminary Spelling stage (Bear, Invernizzi, et al., 1996; Bear, Truex, et al., 1989; Gentry, 1982; Rees & Rivalland, 1994). At this stage, children use symbols from the alphabet to represent words. Learners demonstrate little or no knowledge of letter-sound correspondence. The spelling may or may not have the left to right direction of the English language. There is random use of upper and lower case letters, sometimes mixed with numbers, but there is a definite difference between writing and drawing.

Stage two is called Letter Name, or Semi-Phonetic Spelling (Bear, Invernizzi, et al., 1996; Bear, Truex, et al., 1989; Gentry, 1982; Rees & Rivalland, 1994). In this stage children demonstrate the left to right and top to bottom sequence for writing English. Letter formation is more complete. There is some correspondence between letters used and sound represented, such as hard letter sounds of /r/ or /u/. Often the beginning sound



is represented in the words being spelled. One to three letters may represent a whole word and children understand that a string of letters represents a word.

The third stage of orthographic development is called Within-Word Pattern, or Phonetic Spelling (Bear, Invernizzi, et al., 1996; Bear, Truex, et al., 1989; Gentry, 1982; Rees & Rivalland, 1994). In this stage actual writing takes a variety of forms, such as letters, lists, stories, cards, and direction labels. This is the first time a student maps all the phonic sounds of a word. Letters in words are assigned by the sound they make, not necessarily matching conventional spelling patterns. Children may invent particular spellings for words used frequently. Often at this stage there are spaces between words and words are written in a line form, but not always. Children's writing at this stage is easier to decipher because most audible sounds are represented in their spelling.

Stage four called Transitional Spelling, or Syllable Juncture, observes students' use of conventions in English to spell most words (Bear, Invernizzi, et al., 1996; Bear, Truex, et al., 1989; Gentry, 1982; Rees & Rivalland, 1994). Vowels are used in every syllable. Short vowel patterns are used with accuracy and long vowel patterns are the experiment. The learner will move from a strictly phonic to a more morphological or visual strategy of spelling. The transitional speller may use many correctly spelled words. Basically in this fourth stage the learner moves from sound to structure of words.

The fifth and last stage of spelling development is called the Derivational Constancy, Correct, or Independent Spelling stage (Bear, Invernizzi, et al., 1996; Bear, Truex, et al., 1989; Gentry, 1982; Rees & Rivalland, 1994). Students at this stage understand affixes and how spelling and meaning relationships stay the same when using

prefixes and suffixes. They understand that word parts remain constant across different words. They use word knowledge to extend word uses, including contractions and compound words. They use silent consonants appropriately. Misspelled words are recognized and there is use of alternate spellings. Finally, spellers in this stage know and use regular and irregular forms of words.

Gentry (1982) believes that the correct level of instruction for a learner can only be obtained by identifying the stage of orthography development. Analysis of a student's miscues in spelling is used to figure out what stage of spelling development a student is functioning. Once the correct stage of development has been identified for a student, then objectives for teaching can be determined. Gentry further contends that when the learner enters the transitional stage, frequent writing and formal spelling instruction over a period of five to six years facilitates spelling growth. Spelling can be taught systematically and is central to literacy development (Henderson & Templeton, 1986).

### *Stages of Reading Development*

In the First Steps *Reading Developmental Continuum* there are five basic stages of reading development. This book names these stages as Role Play Reading, Experimental Reading, Early Reading, Transitional Reading, and Independent Reading (Rees & Shortland-Jones, 1994).

In the Role Play Reading stage students become aware of print. Adams (1990) called this stage Print Awareness. Ehri and McCormick (1998) called this stage the Pre-Alphabetic phase. Students begin to behave like readers; they hold a book the right way,

turn pages, and look at the words and pictures within the book. Children in this stage become aware that print has a message and print is everywhere, but the words may change. This stage occurs at the preschool level and Adams (1990) points out that print-rich environments are very necessary for children to develop this awareness of print.

The next stage of reading development is called Experimental Reading because kids do exactly that—experiment. Ehri and McCormick (1998) called this stage the Partial-Alphabetic phase. Students use memory of pre-read materials to match some words with written words (Rees & Shortland-Jones, 1994). Here again, students realize that print carries a message but that written words remain the same when oral words change. They begin to point to known words on a page and recognize personally significant words. Students will use prior knowledge to make meaning of the text and match written words with spoken words.

The Early Reading stage of development is the third phase, also called the Full-Alphabetic phase (Ehri & McCormick, 1998). Students may read unknown text but with much deliberation. The reader focuses on each word, usually having to decode each one. This takes a lot of energy, and often the meaning of the text is lost in the decoding. Readers are beginning to use their own strategy for decoding. Many readers at this stage rely extensively on the first and last sounds to help decipher words. Picture cues and knowledge are frequently used to check for understanding. But, in addition to strategy use, students begin to have a bank of sight words to aid in fluency.

The fourth stage in reading development is called Transitional Reading. Ehri and McCormick (1998) called this stage the Consolidated-Alphabetic phase. Students in this

stage are practicing to become efficient in using many strategies to comprehend and decode words. Students have a much greater sight-reading vocabulary and are good at self-correcting through the use of their personal cueing systems. They understand and can retell the text, while giving their own view of the information given. This stage is definitely the step between the beginning reader and the independent reader. They use all the strategies but just not fully proficient at reading as yet.

The Transitional Reader needs to know many strategies to comprehend text. The following is a list of strategies suggested by Rees and Shortland-Jones (1994) that readers should know and practice using: make predictions, self-correct, change reading pace depending on material, substitute familiar words, and use all types of decoding skills including syllabication.

If students are not using all these strategies by the time they are in middle school then they must be taught, modeled, and practiced in order for the learner to move into the next stage of development to become independent readers (Archer et al, 2000; P. Cunningham, 1998; Ehri & McCormick, 1998; Zutell, 1998).

Rees and Shortland-Jones (1994) called the last stage of development the Independent Reader. Ehri and McCormick (1998) called this stage the Automatic-Alphabetic phase. The readers are independent. Students can recognize structures of text, such as reports, procedures, narrative, or biographies. They use a wide range of strategies to make meaning from text, such as self-correct, re-read, read-on, slow-down, or voicing. These all aid in word identification and comprehension. Students at this stage use word parts, such as root words, prefixes, suffixes, and morphographs to identify unknown

words for both pronunciation and meaning. The Independent Reader is proficient with the list of strategies in the Transitional Reading stage.

### The Spelling, Writing and Reading Connection

Please note in the next section of this review of the literature the word “writing” is somewhat synonymous with the word “spelling.” After all, writing is the application of spelling; just as reading sight word lists are a helpful tools for actual reading.

In the last couple of years, phonemic awareness has come to be the new skill word for reading and writing development. Phonemic awareness is the ability to distinguish the discrete sounds within spoken language that correspond to individual letters (Smith et al., 1995). Schools around the country have had resurgence of phonics instruction within the reading program and begun to teach phonemic awareness at preschool and kindergarten levels. This instruction will give more children a greater chance of becoming good readers. Several studies have shown that the amount of phonemic awareness a student has at the kindergarten is a correlate of future reading success. Good readers have it and poor readers do not (A. Cunningham, 1990).

Phonemic awareness is a skill that relates well to the first and second stages of both reading and writing. As the learner is able to apply the sound-letter correspondence, or the alphabetic principal, awareness of sounds is crucial. The learner no longer just picks a letter or symbol out of the sky to represent an idea in writing but consciously chooses a letter for its sound relationship. In addition, when learners are trying to decode a written word, they use the sound represented by the letter within the word they are trying to comprehend.

The next stage in reading and spelling development is the use of word patterns to expand both spelling and reading acquisition. Rees and Shortland-Jones (1994) suggested that reading instruction should model word attack skills such as first and last word sounds, common word patterns, as well as chunking parts of words. They, as well as others, suggested that in addition to word attack skills there should be development of basic sight words through the use of word walls, which systematically study word patterns (Bear, Invernizzi, et al., 1996; P. Cunningham, 1995; Rees & Rivalland, 1994; Rees & Shortland-Jones 1994).

P. Cunningham (1995) established that a reader gains information about a word in reading from the orthography, its phonology, its semantics, and the context in which the word occurs. In other words, readers use its spelling, pronunciation and its meaning within context. Bell (1991) called these three systems the auditory, visual, and language systems, which must be intact for comprehension. P. Cunningham (1995) further stated, “Readers look at every word and almost every letter of each word” (p. 184). As readers we expect certain letters to occur in sequence with other letters, and this is using spelling patterns to analyze and decode words. Successful decoding occurs when the brain recognizes a familiar pattern, or if not a familiar pattern our brain will search for a similar pattern. Good readers chunk or divide polysyllable words into units based on the individual’s knowledge of what letter patterns have previously been decoded.

P. Cunningham (1995) helps us further understand that sight words are first learned through decoding or phonological processing and then internalized and instantly recognized. Good readers just read more and have more instant words in their reading

and writing vocabulary. So poor readers should read more, but make sure that they can recognize the words instantly (Archer et al., 2000; P. Cunningham, 1995; Zutell, 1998).

As readers and writers have been introduced to, and some have mastered, the basic vowel and consonant patterns, instruction in word patterns usually stops in the primary years. The problem occurs when many students try to enter the upper phases of reading and spelling development and seem to get stuck there. Bear, Invernizzi, et al. (1996) suggested that to help a reader/speller reach the syllable juncture stage, further instruction in prefixes, suffixes and rules for adding morphemes should be taught. Morphemes are the smallest units of sound that have meaning. For example, the letters “re” put at the beginning of a word can mean “again.”

Recently a principal stated that he had several children stuck between the second to fifth grade reading level in the sixth to eighth grade; more reading just does not seem to help the students get to the next level (K. Pearl, personal communication, January 7, 2002). This makes sense with the current research and literature about reading and spelling development. Archer et al. (2000), P. Cunningham (1998), Freyd and Baron, (1982), and White, Sowell, and Yanagihara (1989) each believe that further instruction in word parts, or more specifically the ability to identify and understand word parts within larger words, is the key to the next stage of development for students in reading and spelling.

Archer et al. (2000) and P. Cunningham (1998) both quoted Nagy and Anderson (1984) as saying that each year from the fifth grade on students encounter on average ten thousand new words each year. Most of these new words are big or more than two

syllable words. In addition most of these words are the meaning carrying words of the text students are trying to read. No wonder students are stuck, instruction in word decoding stopped about the second grade for most of these students. Both authors state that little is known about how children decode multisyllable words.

### Why Do Students Need to Explicitly Learn How to Decode Multisyllable Words?

For the past seven decades various names such as, “look and say,” “sight method,” “whole word,” and lately “whole language” methods of teaching reading have dominated the textbooks. These curriculums have been whole word focused and meaning emphasis (Chall, 1997). In whole language there is a basic premise that, “Whole word recognition and phonics are natural outcomes of connected reading not needing to be taught directly” (p. 258). They basically require students to memorize over 2 million individual words.

In a grounded theory study, Nagy and Anderson (1984) set out to estimate how many words were printed in school English. They wanted to find out just how many words students must learn to function in school. Their findings indicated that even the poorest readers in the fifth grade and up will encounter at least 10,000 new words per year. They concluded that teaching students word by word would be futile. “Vocabulary instruction ought, instead, to teach skills and strategies that would help children become independent word learners” (p. 328).

During the past 70 years phonics instruction became known as the “drill and kill” method, which has been equated with being boring and un-motivating to a student (Palmaffy, 1997). However, it seems much easier to teach the 44 sounds heard in speech



and relate them to the 200 letter combinations found in the English language than this whole mass of words.

Smith et al. (1995), in a review of research using thirteen studies on reading acquisition, reported on documented studies that phonological awareness was the greatest predictor of reading acquisition. Their definition of phonological awareness is the conscious ability to detect and manipulate sound (e.g., move, combine, and delete), access to the sound structure of language, and awareness of sound in spoken words in contrast to written words. It was noted by Diegmueller (1996) that good readers see every single word and de-code so fast that it seems they are skimming. Poor readers use every technique available to them in whole word reading instruction such as, context clues, visual clues, skipping and reading on, and just guessing so often that too much energy is spent on reading and comprehension is lost (Adams, 1997; Chall, 1997; Lyon, 1997; Smith et al., 1995; Sweet, 1997). Teaching reading is more than meaning emphasis, but must include the alphabetic understanding as well.

The definition of alphabetic understanding is the understanding that letters represent sounds, and that whole words have a sound structure consisting of individual sounds and patterns of groups of sounds. The combination of alphabetic understanding and phonological awareness becomes the larger construct, alphabetic principle (Smith et al., 1995).

The debate now becomes not if phonemic awareness and phonics should be taught, but how and when to teach them. Research calls for explicit and early instruction (Adams, 1997; Chall, 1997; Diegmueller, 1996; Lyon, 1997; Smith et al., 1995). Explicit

phonemic awareness should be taught as early as preschool and continued until the child has mastery. Phonological awareness is necessary, but not sufficient for reading acquisition.

As well as phonemic awareness, the alphabetic code must be mastered through explicit phonic instruction (Smith et al., 1995). Students need to be taught the alphabetic code so that they have a system of language. Students need a way to take the guesswork out of reading. The two types of curriculum, look and say method versus phonics instruction, differ in how fluency is obtained. Both agree that rapid naming or fluency is critical for comprehension (Diegmueller, 1996; Weaver, 1994). Once fluency is rapid enough, comprehension should happen in a child's own reading. In look and say method, a student is told the whole word and expected to memorize it. With the use of the decoding, students are given the tools to decipher words encountered in print that are not automatic to them.

One way to teach decoding is through segmentation of single letters that represent sound phonemics. However, for most students who struggle with reading, blending these single sounds together to make a comprehensible word is the most difficult task in phonemic awareness. First sound, last sound, and segmenting all seem to be easier than putting sounds back together again (O'Connor, 1992). Perhaps one easier way to blending single sounds is through syllabication. Archer et al. (2000) have developed a curriculum called REWARDS that teaches older students how to divide multisyllable words into smaller units to decode larger words. If students learn how to identify and pronounce common prefixes and suffixes, and break the rest of a word into three- to four-

letter units that include a vowel, then maybe blending units will be easier. This could be especially true for older students who struggle with reading fluency yet have comprehension of individual letter-sound correspondence.

This is not to suggest that the immersion in a strong literature program should not exist until fluency is obtained. Children should be constantly read to with rich literature. They need to be surrounded by good books to look at and to read. Students need to talk about, summarize, predict, and infer information found in good literature (Flippo, 1999; May, 1994).

Archer et al. (2000) wrote,

While the ultimate goal of reading instruction is comprehension, not word recognition, all of us recognize the importance of word recognition skills. If I am unable to read the words, I have no pathway to comprehension. In fact many researchers have concluded that poorly developed word recognition skills are the most pervasive and debilitating source of reading challenges. (p. 3)

Educators must take it upon themselves to help millions of students who have not had formal instruction in decoding. Now that research fully supports both immersion in literature and teaching explicit decoding skills, teachers need to find ways to teach decoding to students who have letter-sound recognition but still struggle with decoding.

### What Does Current Research Suggest About How and When to Teach Students Multisyllabism?

Currently in most schools across the United States, the actual teaching of reading decoding skills stops after the second grade (Archer et al., 2000; P. Cunningham, 1998). However, most of the decoding skills students learn, such as sound out, skip and read on,

use the first letter, put what makes sense in the blank, and using picture clues, have been taught for single syllable words. After about the fourth grade most of the words that students encounter are multisyllable and these words are the content meaning words of the reading selection.

In a report, P. Cunningham (1998) presented results of research on the multisyllabic word dilemma. What was the best way to help students gain meaning, spell, and read big words? In her report she referenced a study done by Shefelbine (1990), in which the results supported directly teaching students how to identify and pronounce syllables, and then understand how those syllables work within multisyllable words. P. Cunningham further suggested that after the third grade students be explicitly taught to look for the word patterns, use familiar related words to connect to the unknown word, and teach prefixes, suffixes, and roots of words within the context of reading and spelling.

Zutell (1998), also in a report, maintained that both spelling and reading were a developmental process. He concluded that all students proceeded through the same stages of development whether a normal achieving student or a delayed learner. For learning to go forward, the instructor must understand the stage of development the learner is in—zone of proximal development, coined by Vygotsky. Zutell maintained that word sorting should be the basis for all reading and spelling development. He asserted that the English spelling system is systematic, but not at the letter-to-sound level. It is an organization of patterns within the English language pronunciation. The understanding of this system progresses over time, and as the reader and writer develops, the organization

of patterns become more complex. This is not a rote memorization process, but a conceptual understanding of words for spelling and reading.

Ehri and McCormick (1998) also reported that word learning progressed by stages. They emphasized a teacher's knowledge of the phases is needed to assess what phase a student is functioning at in order to facilitate learning. In the fourth phase of learning to read or write, Ehri and McCormick further stated that students gain the ability to chunk letters that occur repeatedly in different words is an important form of acquisition during this stage. Those letter chunks can be root words, prefixes, suffixes, onsets, rimes, and syllables. The value of knowing these chunks is that it helps facilitate with decoding, automaticity, fluency, and sight word knowledge.

The book titled *Words Their Way: Study for Phonics, Vocabulary, and Spelling Instruction* written by Bear, Invernizzi, et al. (1996) specified that literacy is made up of four strands. The four strands are oral language, stories, writing, and reading. They promote understanding phases of development in terms of orthography by knowing what phase an individual student is functioning, through assessment, and stimulating, through word study, growth to the next phase. "Word study is the active process in which students categorize words or pictures" (Bear, Invernizzi, et al., 1996, p. 66). Students look for patterns in both oral and written forms as the sorts become more sophisticated through the final phases of syllable juncture and derivational constancy. This facilitates orthographic knowledge as well as vocabulary growth.

There is much support for understanding the phases of word development in order to understand the present level of function for each student. Each learner passes through

these stages, and a good facilitator will provide activities at the appropriate stage to promote growth in the learner to the next phase. The second to last stage seems to be the syllable stage. In this stage, introduction to see and hear spelling patterns within a word are supported through studies of onset, rime, prefixes, suffixes, root words and understanding syllables (Bear, Invernizzi, et al., 1996; P. Cunningham, 1998; Ehri & McCormick, 1998; Zutell, 1998).

### Other Research Studies on Teaching Multisyllabism

Syllabication and the rules for dividing words into syllables for both pronunciation and spelling are still published in some English dictionaries (Stein, 1971). But are children being taught those rules? And does it work to help students read or spell better? Canney and Schreiner (1976-77) conducted an experiment to study the effectiveness of select syllabication rules and phonogram patterns for word attack skills over a four-week period to second grade students. The study contained three experiment groups: syllabication rules, phonogram patterns, and a control group. The results indicated that the control group gained as much as the experiment groups in word attack and reading comprehension, due to the block scheduling of reading instruction. The syllabication group scored higher in the test of syllabication rules only. Their study did not evaluate the effectiveness of syllabication instruction on spelling achievement. Canney and Schreiner further suggested instruction in syllabication rules to third or fourth grade students, over a longer period of time, may improve word attack and reading comprehension.

In 1982, Freyd and Baron conducted an experiment on fifth and eighth graders with both groups reading at about the same level of proficiency. They tried to answer the following question: Through morphological learning, was vocabulary acquisition of complex words used more by good word-learners (fifth graders) versus average word learners (eighth graders)? They concluded that faster learners used the root of word and its affix more often to gain the accurate meaning of a word. In a test of pseudo-words the fifth graders gained the meaning of words more readily when the words were derivationally related. When the pseudo-words were not derivationally related, the scores between the fifth and eighth graders were about the same. The implications of this research indicated that all learners would benefit from more knowledge about affixes and their effects on the meaning of a word.

Cox and Hutcheson (1988) reported the teaching strategies of syllable division, which were derived from a ten-year study conducted at the Texas Scottish Rite Hospital in Dallas. Over 1,000 children with dyslexia (ages 7 to 15) were used to develop and test this curriculum. The curriculum was based on the Orton-Gillingham techniques because that method had worked for many years. This method is based on the inability to visually remember two-dimensional symbols, so it couples associating the visual and kinesthetic aspects of a symbol with the auditory memory of a spoken word. The outgrowth of this research was a program called Alphabetic Phonics. Alphabetic Phonics is a step-by-step way to introduce and master phonic awareness, letter sound correspondence, monosyllable, and two syllables to multisyllable words through the use of multisensory

procedures of coding and self-generated formulas for pronouncing words through discovery.

There is evidence that multisyllable words can be taught to students by using word parts or morphological analysis. White, Power, and White (1989) conducted a study, which found direct support of teaching morphological analysis for vocabulary growth in students above the fourth grade. Morphological analysis was defined as the ability to break an unfamiliar word into parts and then recombine the parts into a meaningful whole (White, Power, et al., 1989). That study involved teaching prefixes, suffixes, and root words. They found affixed words outnumbered the root words in printed school English by almost 4 to 1. This study also contended that if students understood a root word and added different affixes, most of the time the meaning of the word would be understood.

It was interesting to note that 58% of prefixed words used only four different prefixes. The four prefixes are “un-”, “re-”, “dis-”, and “in-.” Three suffixes in the English language account for 65% of the affixed words; the three suffixes are plural or third person singular “-s”, “-es,” past “-ed,” and the progressive “-ing.” White, Power, et al. (1989) also supported the orthographic teaching of three morphographic rules for adding suffixes to words. They are delete silent “e,” change “y” to “i,” and double the consonant. If teachers were to teach just the seven affixes and three rules to those affixes both in spelling and pronunciation, students would have conquered at least 58% to 65% of new words encountered.



In another study White, Sowell, et al. (1989) taught word part clues to middle elementary students using 9 prefixes and 10 suffixes to promote meaning of unfamiliar words. The 9 prefixes were: “un-”, “dis-”, “in-”, “im-”, “ir-”, “non-”, “re-”, “en-”, and “em-”. The 10 suffixes were: “-s”, “-es”; “-ed”; “-ing”; “-ly”; “-er”, “-or”; “-ion”, “-tion”, “-ation”, “-ition”; “-ible” “-able”; “-al”, “-ial”; “-y”; and “-ness”. This study found significantly higher scores for the instructed group than the control group, thus supporting the need for explicit instruction in the 9 prefixes and 10 suffixes which account for 75% and 85% respectively of the words introduced in third to ninth grade according to Carroll (1971).

Lenz and Hughes (1990) replicated a quantitative study three times using a multiple-baseline design with 12 subjects from middle school and high school with reading disabilities. The adolescents were taught a seven-step word identification strategy called DISSECT, which is an acronym for a strategy to decode unknown words. The seven progressive steps were: discover the context, use meaning to guess; isolate the prefix; separate the suffix; say the stem by looking for a recognizable phonemes; examine the stem, by dissecting it into two or three letter word parts each containing a vowel; check with someone; try a dictionary. At any point, when the student understood the word, the DISSECT process would stop. Students did decrease in the number of word identification errors, but an increase in comprehension was not found in all subjects. The positive results support direct teaching of word identification tactics, but cautioned of a possible loss in comprehension while acquiring the new decoding strategy. The loss of temporary reading comprehension needed further study.

Abbott and Berninger (1999) found that it was never too late to remediate word recognition skills to students in grades four to seven with reading disabilities. In this randomized group pretest-posttest design, with one treatment group and one control, all participants scored higher in reading measures from pretest to posttest. Each group of students was taught phonological and orthographic awareness, the alphabetic principle, decoding phonologically and oral reading. However, one treatment group was taught structural analysis to find affixes and syllables to decode and spell unknown words. Even though Abbott and Berninger found no statistical significance between the two treatments, the positive growth in reading scores did support explicit instruction in early reading skills, especially the alphabetic principle.

### Why Was the REWARDS Program Selected as an Appropriate Strategy for “Chunking” Multisyllable Words?

The REWARDS program was selected because it incorporated many aspects of past and current research that suggested appropriated strategies for teaching multisyllabism. REWARDS is a strategy that is taught over twenty lessons and is recommended for students who are at the fourth to eighth grade, but read at the upper second to sixth grade level. It teaches vowels vowel combinations in isolation and within the word. It teaches basic identification and spelling of prefixes and suffixes. It has students practicing hearing and spelling words, and word parts. And it gives repeated practice of the strategy in all contexts of reading, such as single letters, word parts, whole words, words within a sentence, and finally paragraph reading to increase word decoding and reading fluency.

The first reason the REWARDS program was selected was because it was a strategy for decoding multisyllable words. The strategy is first taught overtly, then internalized covertly. Pressley and Harris (1990) brought to our attention that strategy instruction can be very powerful in improving students' learning, but not much research has been conducted to find the effectiveness of specific strategies. This thesis attempts to find out the effectiveness of this strategy and what effects it has on increasing decoding skills, reading fluency and spelling accuracy.

The REWARDS program is commensurate with the stages of development in both spelling and reading in that it is suggested for use with readers who are reading above the second grade level. In other words, students have a basic sight word and spelling bank of single syllable words with some two syllable words, but not fluent with multisyllable words. This program practices the activities that need to be mastered to move beyond the fourth stage of reading development (Rees & Shortland-Jones, 1994). Furthermore, this program practices some of the activities that need to be mastered to move beyond the third and fourth stages of spelling development, such as long and short vowel patterns and prefixes and suffixes (Bear, Invernizzi, et al., 1996).

Current research in decoding multisyllable words revealed the need to teach word parts or word sorts through patterning, vowel identification, and recognition of prefixes and suffixes. (Bear, Invernizzi, et al., 1996; Bear & Truex, et al., 1989; Canney & Schreiner 1976-77; Cox & Hutcheson, 1988; P. Cunningham, 1998; Freyd & Baron, 1982; Gillet & Kita, 1978; Lyon, 1997; White, Sowell, et al., 1989; White, Power, et al., 1989; Zutell, 1998). The REWARDS program teaches the learner to look for prefixes and

suffixes and then look for the identifiable word parts that remain. It gives direct instruction with repeated modeling and practice in identifying vowel sounds in isolation, in word parts, in multisyllable words, in sentences and in multiple paragraphs.

The prefixes and suffixes that are taught in the REWARDS program are the most use in the English Language as outlined by P. Cunningham (1998), Stanback (1992), White, Power, et al. (1989), and White, Sowell, et al. (1989). The prefixes used in the REWARDS program match these authors' lists. In addition, the vowel sounds presented in this program were also the most frequent encountered in our language as outlined by the above authors. Teaching students to look for patterns, or known chunks, in words allows the use of a strategy to decode and spell all words, rather than the enormous time it would take to learn each word separately (Nagy & Anderson, 1984; Stanback, 1992).

Reading fluency is practiced by repetition of single sounds and progresses to repeated timed reading of whole passages in content areas. The REWARDS lessons are designed with introduction of new material daily and repeated practice of previously learned material. Bate (2002, Winter), Carreker (2002, Winter), and Smith et al. (1995) all contended that rapid naming of word or word parts was a critical step toward increasing reading fluency.

Meyer (2002, Winter), in a report, revisited the concept of repeated reading to increase reading fluency. She reported on 35 years of evidence that supported repeated reading to increase reading fluency. The method which Meyer wrote about was one in which the student read a passage several times until the target rate of reading was reached. This included the one-minute timings of correct words per minute (CWPM),

which were charted to show progress (Meyer & Felton, 1999). The REWARDS program included repeated reading, timings, and charting in the last seven lessons.

The REWARDS program was chosen because it seemed to be well grounded in current research theory on how to teach students how to decode multisyllable words through the use of “chunking” and repeated practice. It was chosen because it was a strategy that could apply to any word anywhere for the rest of the student’s life. It was also chosen because the program was already written with 20 direct instruction lessons. The materials included were pretests, posttests, and a generalization test. Each lesson took about 45 minutes, which was the amount of time for each class period for the middle school students in the study. And, it was written at an appropriate interest level for middle school students. Why not try a program that is grounded in theory, direct in instruction, short in duration, age appropriate for middle school students, and could conceivably show long-term growth in reading quickly?

### Summary and Conclusion

When the history of spelling and reading instruction is analyzed there is support to not separate the two subjects. Spelling and reading are interrelated. Reading starts with the learning of letter sounds and spelling starts with the learning of sounds and the letters they represent. As Goswami and Bryant (1990) stated, there is a cause and effect relationship.

In the factory model of teaching in the 19th century, educators tried to compartmentalize everything in life as they did when the two areas of language development were divided (Perkinson, 1995). It has taken educators nearly two hundred

years to understand the relationship between the two. In the whole-word era, they tried to get away from the drudgery of teaching basic skills, but it was those very skills in both reading and spelling that allow students to enjoy the rich literature and writing of the whole language movement. As educators tried to bring compartments of curriculum back together, parts were, and still are, left out without understanding the consequences of the deletion.

Only now do educators understand the consequence of the lack of instruction when so many children do not read, write, or spell at grade level. Educators must understand the stages of development in reading, writing, and spelling and how they are interrelated. Only by thoroughly understanding the stages of development can an educator use the miscues of students. When miscues are understood, a teacher can meaningfully develop appropriate lessons to help guide a learner to the next stage of development.

Over the last 10 years, educators have done a good job of implementing current research in phonemic awareness and understanding the value of explicit phonic instruction for the developing learner. However, educators must still pay the price of students who never got the instruction or were not developmentally ready to understand the instruction. The importance of spelling and reading instruction beyond the primary grades is now starting to be understood. This instruction, supported by research, should be continued into the intermediate and middle school years with the development of understanding and decoding multisyllable words.

Programs to teach multisyllable words are just beginning to be available to the education teacher, such as REWARDS. What is common to each research study and teaching program is the support for chunking words into word parts through teaching prefixes, suffixes, and root words, including vowel sounds, instead of the old dictionary rules for dividing words into syllables.

The final commonality is the support for teaching the interrelatedness of reading, writing and spelling, as one cannot exist without the other. After all, the reader is reading what has been written. Without writing there would be no reading, and without reading what is the point of writing? It is time for educators to move all of their students to be independent readers and spellers. Right now research is telling educators what the next step is in order to increase fluency in both reading and spelling, and the first step is through teaching word chunking, or multisyllablism.

## CHAPTER III

### PROCEDURES OF THE THESIS STUDY

#### Experimental Design

This experiment was a non-randomized group pretest-posttest design. It employed non-randomized groups, but teachers did randomly select, within each classroom, those whom they thought could benefit from the reading and spelling strategy instruction. If the results showed improvement then the rest of the students within each classroom would receive the program in the following two quarters of school that year. The experiment was replicated with two different teachers, in two separate classrooms, in the same school district. The control groups came from the three separate teachers and four different classrooms. The control group for the most part was using the Academy of Reading, a computerized reading program that teaches phonics and phonemic awareness as well as reading comprehension.

#### Subjects and Setting

The 23 subjects were sixth and seventh graders who met requirements for special education resources in the areas of reading or written language. Each subject was served in special education in the areas of reading or written language as outlined by the State of Washington Administrative Code. The qualifying area, such as serious learning disability, mentally retardation, health impairment, and serious behavior disorder did not matter as long as the Individual Education Program (IEP) team for each student, deemed it necessary for that student to be served through special education in reading or written language. The IEP team in Washington State consists of the parent, the student, an



administrator, a school psychologist, a special education teacher, one or more general education teachers of the student, and sometimes a school psychologist or other related service personnel.

Subjects attended two different middle schools in a Central Washington community and were served in special education classes for three or less periods per day. No more than two language arts classes could be taken. The third period takes into account that the student may be served in a special education math class as well. In addition, subjects were only selected if they met the following criteria: reading comprehension at or above the second grade level. The Brigance Comprehensive Inventory of Basic Skills-Revised (Brigance CIBS-R) was used to determine reading level. The mean reading grade level for the experimental group was 3.36, with a range of 2 to 6. The mean reading grade level for the control group was 3.83, with a range of 2 to 8.

The intervention took place in three classrooms in two schools, from early October through January. All three classes were taught in the morning. Total class size ranged from 4 to 11. The instructional group size ranged from 4 to 9. A total of 25 students met the selection criteria for reading at the second grade level or above. Twenty-five students were selected as subjects for this study. Two female subjects in the experimental group were discontinued in the data collection due to moving or leaving, resulting in a sample size of 23.

There were 5 females and 18 males that composed the student sample. Student ages ranged from 10.10 to 13.10 years old, with a mean of 12.3 years old for the 23-

subject sample. The mean age for the experimental group was 11.11 years old, with an 11-subject sample. The mean age for the control groups was 12.5 years old with a 12-subject sample.

There were 15 sixth graders, of which 11 were males and 4 were females. There were 8 seventh grade subjects in the study, 7 of which were male and 1 was female. The experimental group had a total of 11 subjects; 4 female sixth graders 7 male sixth graders, and no seventh graders. The control group consisted of 12 subjects; there were 4 male sixth graders, 1 female seventh grader, and 7 male seventh graders.

There were 5 English as a second language students, 3 females and 2 males, in the experimental group. No English as a second language students were in the control group. The ethnic break down in the experimental group consisted of 2 Hispanic males, 4 Hispanic females, and 5 white males. The ethnic break down of the control group consisted of 11 white males and 1 white female.

### Teacher Training

There were three middle school teachers used in the study. One teacher received no training as her students were used as a control group in the same school as the investigator. The investigator was given no training in teaching the REWARDS program, as this was the third year she had used the program. The teacher from the second school was given about two hours of training. The teacher had a copy of the REWARDS program, which she read through to become familiar with the book. In the first training she asked questions on sections she was unsure about. It was agreed to use the script as closely as possible without making it seem that one was reading to the students.

The second one-hour training had to do with testing and data taking. Each teacher already knew how to give the Brigance CIBS-R. All teachers agreed to give all students at the start of the school year the reading comprehension subtest. In addition, each teacher agreed to use Read Naturally at each student's instructional reading level determined by the San Diego Quick, to use as a reading fluency indicator. The cold one-minute timing would be used for purposes of this study. There would be at least three pre-intervention timings and three post-intervention cold timings. The CWPM scores were used to obtain the average pretest and posttest fluency scores. Using Read Naturally was a normal reading procedure for the students in special education in that district. The teacher from the second school and the paraprofessional from the investigator's classroom were instructed in how to score the San Diego Quick as a level indicator for the Read Naturally. The instructional level would be used as grade placement in Read Naturally. For reading decoding scores, the REWARDS Pre/Post test was demonstrated to the second teacher and the investigator's paraprofessional. In accordance with the directions, a point would be awarded for each correct syllable (word chunk) in a word read regardless if they knew the word or not. The Generalization test, to be used after the posttest, was introduced and demonstrated like the Pre/Post test was for reading.

The spelling Pre/Post test adapted from the REWARDS program was used after the reading test. It was demonstrated how to give the spelling test: Say the word, use the word in a sentence, and repeat the word one more time. It would be given as whole group and then scored on the scoring form afterwards. The same format would be used for the spelling Generalization test to be given after the reading Generalization test.

## Instructional Procedure

Lessons 1 to 12 consisted of 10 activities as printed in the REWARDS teaching guide. In Activity A, the teacher begins with an oral activity saying multisyllable words slowly one syllable at a time and then asks the students to say the whole word.

Activity B is learning vowel combination sounds (e.g. /ay/, as in say). Each lesson added more vowel combination sounds until 21 vowel combinations were covered. The /ay/ was used sixteen times in vowel combination review in the twenty lessons. The /au/, as in sauce, was used in vowel combination 26 times.

Activity C was called Vowel Conversions. Students were taught the sound of single vowel sounds as in commonly used short vowel sounds and, at the same time, taught to say the letter name as in long vowel sounds: Say the sound and say the letter name. All five vowel letters were used.

In Activity D, students read using word parts that practiced the vowels and vowel combinations learned to that point (e.g. cay: /ay/, cay). Activity E consisted of students underlining vowel sounds in multisyllable words. Once the vowel underlining was finished, students practiced reading all the vowel sounds within the word and then read the word (e.g. waylay: /ay/, /ay/, waylay).

Activity F was an oral activity to correct close approximations in using context. A word was read by word chunks and then used in a sentence. Students then stated the correct pronunciation of the word (e.g. hot el, when we were on vacation we stayed in a hot el).

Activity G introduced affixes which were called word parts starting at the beginning of words and at the end of words. Not all the word parts carried meaning, which is why the book called them word parts. Students were told the word and the word part, and then practiced reading just the word parts.

In Activity H, students circled the beginning and ending word parts learned so far. After checking their circling, students went through and read each word part, then the word.

Activity I was a focus on meaning. Students read a definition and found a word from Activity H that matched the definition. Students were given a line clue and then wrote the word next to the definition in the student workbook.

The last, Activity J, was spelling dictation. Students spelled four words from the lesson. The word was stated, said in word parts, and then students were encouraged to say the word parts to themselves as they wrote the word. These were the ten activities of lessons one through twelve.

Lessons 13 through 20 changed somewhat; there were nine activities. Activities A and B were the same as activity B and C in the first 12 lessons. Activity C was reading individual word parts at the beginning and end of words, reviewing what was previously covered.

Activity D was strategy instruction. It practiced using the overt strategy of circling beginning and ending word parts, underlining the vowel sounds in the rest of the word, saying the word parts, and then saying the whole word. Activity E was using the

strategy from Activity D. Activity F was word reading review using the covert strategy and the overt strategy in part D only if needed. These were words already practiced.

Activity G was spelling dictation as outlined in Activity J in lessons 1 to 12.

Activity H was sentence reading. It included words already practiced in the lesson.

Students read the sentences in a variety of ways: oral, individually to themselves, or with a partner.

Activity I was passage preparation. In part one, the teacher told the students the words and the students practiced them. In part two, the students practiced the words of the story using the strategy learned.

The last activity was passage reading. First the students read the passage for accuracy in a variety of ways: silently, orally, individually out loud, and to a partner. This was varied daily or depending upon need of the student. The second part was a series of comprehension questions that the teacher asked and the students answered orally. The third part was to build reading fluency. Using the same article, the students whisper-read the article from the beginning for one minute. At the end of the minute, the students circled the last word read. Next, the students would read from the beginning again for one minute and draw a square around the last word read. Last, the students read to a partner from the beginning for one minute. While one partner was reading, the other partner was underlining words that were missed or omitted. A line was drawn on the last word read. The total amount of words was counted minus the errors or omitted words for a total of correct words per minute. The last eight lessons consisted of these nine activities.

In Archer et al. (2000), the covert strategy consisted of the following four steps:

1. Look for the word parts at the beginning and the end of the word, and vowel sounds in the rest of the word.
2. Say the parts of the word.
3. Say the parts fast.
4. Make it a read word (p. 314).

### Measurement Tools

Seven measures of reading and three measures of spelling were used in this study.

For Reading, each subject was given a pretest in the Brigance CIBS-R in reading comprehension, the San Diego Quick, three one-minute cold fluency timings, and the REWARDS reading pretest. The posttests consisted of three one-minute cold fluency timings, the REWARDS post reading test and the reading Generalization Test. The Brigance CIBS-R in reading comprehension was used to make sure all students for the study could read at the second grade level or above. In addition, it was used to check the reliability of the San Diego Quick scores for the individual student. If there was a discrepancy between grade level scores of more than one grade, the San Diego Quick was given again.

The San Diego Quick is a single word recognition test and was used to place students at their instructional level for the reading fluency timings in Read Naturally leveled reading material. The CWPM read on the cold timing from Read Naturally were used to determine fluency for this study. Each student was given at least three one-minute timings before the intervention began, and at least three one-minute timings post-

intervention. The average of these three-minute timings was used as a CWPM score for fluency, both pre-intervention and post-intervention.

Each student was given the twenty-word reading pre/post test from the REWARDS program before instruction began and again after completion of the 20 lessons. A post Generalization Test developed by the program was also administered. The REWARDS Pre/Post test and Generalization Test were used, as intended, to show growth in ability to decode multisyllable words.

For spelling, the Pre/Post and Generalization tests from the REWARDS program were also used as spelling discrimination tools. Just as students received credit on the reading test for parts of words read correctly students were given credit for each “chunk” of a word spelled correctly. For example, the word impression had three word parts: “im press sion.” If students correctly spelled two parts, they would receive two points, or if the whole word was spelled correctly, they would receive three points. This gave the spelling accuracy tests the same score as the reading with a possible score of 78 points for 20 words. This gave a more precise measurement of spelling gains on practiced words, as well as words not encountered in the program through the Generalization test.

### Measurement Analysis

The measurement tools were used to determine the statistical significance of the experimental group to the control group by calculating the difference between pretests and posttests. Five separate two-tailed *t*-tests were utilized. The first *t*-test calculated the statistical significance between the REWARDS pretest and posttest in reading for the first variable of decoding. The second *t*-test measured significance between the pretest and the



Generalization test for decoding. The third  $t$ -test measured the significance between the pre-intervention and post-intervention of the one-minute cold timings for CWPM in reading fluency. The fourth  $t$ -test measured the significance between the pretest and the posttest in spelling, for the spelling accuracy variable. The last measurement was between the pretest and the Generalization test in spelling. These five  $t$ -tests were used to support the null hypothesis.

## CHAPTER IV

### RESULTS OF THE STUDY

#### Results

The experimenters administered the following tests to the subjects: Brigance CIBS-R reading comprehension subsection; the San Diego Quick; Pre and Post scores on cold one-minute timings for leveled reading fluency; the REWARDS Reading Pre/Post and Generalization tests; and adaptations to the REWARDS Pre/Post and Generalization reading tests, using the same test samples two spelling tests were created (see Appendixes A and B). Several *t*-tests were used to compare the difference of pretest to posttest for individual students, and then the mean difference was compared as a group to the experimental group and to the control group. The *t*-test was repeated for reading decoding, reading fluency, and spelling fluency to determine statistical significance to accept or reject the null hypothesis. A two-tailed *t*-test was utilized because the null hypothesis could have been rejected in either a positive or negative direction.

The Brigance CIBS-R was used to determine reading comprehension scores of a 2.0 grade level or better to be included in the study. The range in the experimental group was 2.0 to 6.0, *n* (13), *M* = 3.26. The range of the control group was 2.0 to 8.0, *n* (12), *M* = 3.83.

The REWARDS Pre/Posttest was used to determine decoding gains, the first dependent variable, in the subjects. The difference in scores between the pretest and the posttest were used to determine a mean score for the experimental group and the control group. This difference calculated a mean score of 24.27 for the experimental group and a

mean score of 12.9 for the control group. Computing the  $t$ -test for reading decoding data yielded no significance ( $t(16) = 1.67, p > .10$ ). The  $t$ -test produced a calculated  $t$  value of 1.67. The  $t$  critical value for a two-tailed test ( $p < .05$ ) with 16 degrees of freedom is 2.119. Since the obtained  $t$  value ( $t = 1.67$ ) was less than the table  $t$  value ( $t = 2.119$ ), there was no statistical significance. The effect on reading decoding was not statistically significant ( $t(16) = 1.67, p = .11$ ) (see Table 1).

Table 1

Pre/Post Reading Decoding  $t$ -Test: Two-Sample Assuming Unequal Variances

Source	$M$	$n$	$df$	$t$ statistic	$p$	$t$ critical
Experimental	24.27	11				
Control	12.90	10				
Results			16	1.67	.11	2.11

*Note: The probability of error score, or  $p$  value, must be  $< .05$  to be statistically significant.*

After the pre/posttest comparison of reading scores, next the pretest and the generalization test were compared and analyzed for statistical significance. The generalization test included decoding multisyllable words not included in the training for either the experimental group or the control group. The  $t$ -test produced calculated  $t$  value of 1.53. The  $t$  critical value for a two-tailed test ( $p < .05$ ) with 12 degrees of freedom is 2.18. Since the obtained  $t$  value ( $t = 1.3$ ) was less than the table  $t$  value ( $t = 2.119$ ), there was no statistical significance in the reading pretest and generalization test comparison.

The effect on reading decoding for multisyllable words not previously studied was not statistically significant ( $t(12) = 1.53, p = .15$ ) (see Table 2).

Table 2  
Pre/Generalization Reading Decoding  $t$ -Test: Two-Sample Assuming Unequal Variances

Source	$M$	$n$	$df$	$t$ statistic	$p$	$t$ critical
Experimental	20.25	8				
Control	5.83	6				
Results			12	1.53	.15	2.18

*Note: The probability of error score, or  $p$  value, must be  $< .05$  to be statistically significant.*

The San Diego Quick was reported as grade equivalent scores. The San Diego Quick instructional level score was then used to level students in appropriate reading material for the one-minute timings for the reading fluency scores, the second dependent variable. In the one-minute timings, an average CWPM score was then recorded for pre-intervention and post-intervention; the same level of material was used pre- and post-, regardless of any individual gains in reading fluency. The range of CWPM for the pretest experimental group was 38.6 to 85.5,  $n(10)$ ,  $M = 62.36$ . The range of CWPM for the post experimental group was 29 to 115,  $n(10)$ ,  $M = 72.65$ . The range of CWPM of the pretest control group was 43 to 103,  $n(6)$ ,  $M = 74.26$ . The range of CWPM of the posttest control group was 64 to 105.6,  $n(6)$ ,  $M = 90.52$ . A  $t$ -test was then utilized to determine the statistical significance between the reading fluency mean difference of the pretest and posttest of the experimental group compared to the control group. Computing the  $t$ -test

for the reading fluency data yielded no significance ( $t(13) = -0.89, p > .10$ ) between means of this dependent variable. The reading fluency  $t$ -test produced a calculated  $t$  value of  $-0.89$ . The  $t$  critical value for a two-tailed test ( $p < .05$ ) with 13 degrees of freedom is 2.16. Since the obtained  $t$  value ( $t = -0.89$ ) was less than the table  $t$  value ( $t = 2.16$ ), there was no statistical significance. The effect on reading fluency was not statistically significant ( $t(13) = -.89, p = .39$ ) (see Table 3).

Table 3

Reading Fluency  $t$ -Test: Two-Sample Assuming Unequal Variances

Source	$M$	$n$	$df$	$t$ statistic	$p$	$t$ critical
Experimental	10.29	10				
Control	16.25	6				
Results			13	-0.89	.39	2.16

*Note: The probability of error score, or  $p$  value, must be  $< .05$  to be statistically significant.*

The third dependent variable data was taken from the adapted REWARDS spelling pre/post tests. These tests were used to determine spelling accuracy in the subjects for the experimental and control groups. The difference in scores between the pretests and posttests were used to calculate the means for the experimental and control groups. The mean scores were then used to determine statistical significance using a  $t$ -test. The mean score for the spelling accuracy experimental group was 14. The mean score for the spelling accuracy control group was 6.7. Calculating the  $t$ -test for spelling accuracy yielded no statistical significance ( $t(17) = 1.78, p > .05$ ). The  $t$ -test produced

calculated  $t$  value of 1.78. The  $t$  critical value for a two-tailed test ( $p < .05$ ) with 17 degrees of freedom is 2.11. Since the obtained critical  $t$  value ( $t = 1.78$ ) was less than the table critical  $t$  value ( $t = 2.11$ ), there was no statistical significance ( $t(17) = 1.78, p = .09$ ) (see Table 4).

Table 4

Pre/Post Spelling Accuracy  $t$ -Test: Two-Sample Assuming Unequal Variances

Source	$M$	$n$	$df$	$t$ statistic	$p$	$t$ critical
Experimental	14.0	10				
Control	6.7	10				
Results			17	1.78	.09	2.11

*Note: The probability of error score, or  $p$  value, must be  $< .05$  to be statistically significant.*

After the Pre/Posttest comparison of spelling scores, next the pretest and the Generalization test of spelling were compared and analyzed for statistical significance. The Generalization test included multisyllable spelling words not included in the training for either the experimental group or the control group. The  $t$ -test produced calculated  $t$  value of 3.68. The  $t$  critical value for a two-tailed test ( $p < .05$ ) with 16 degrees of freedom is 2.119. Since the obtained  $t$  value ( $t = 3.68$ ) was more than the table  $t$  value ( $t = 2.119$ ), there was statistical significance in the spelling pretest and generalization test. The effect on spelling accuracy for words not previously studied had a probability of error equal of .002 (see Table 5).

Table 5

Pre/Generalization Spelling Accuracy *t*-Test: Two-Sample Assuming Unequal Variances

Source	<i>M</i>	<i>n</i>	<i>df</i>	<i>t</i> statistic	<i>p</i>	<i>t</i> critical
Experimental	16.90	10				
Control	3.33	6				
Results			16	3.68	.002	2.12

*Note: The probability of error score, or *p* value, must be < .05 to be statistically significant.*

### Conclusion

Therefore, the null hypothesis was not rejected in all three variables utilizing five separate *t*-tests for analysis of data. The study results fail to reject the null hypothesis in four out of five *t*-tests. There is no statistical significance between middle school students with reading disabilities in multisyllable word decoding, reading fluency, and spelling accuracy when taught a strategy for “chunking” multisyllable words compared to a control group that is not taught the strategy.

## CHAPTER V

### INTERPRETATION OF RESULTS, CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

#### Interpretation of Results

The goal of this thesis was to accept or reject the null hypothesis that the REWARDS program would not increase reading decoding, reading fluency, and spelling accuracy of middle school students with reading difficulties. Even though the null hypothesis was accepted, the analysis of results does demonstrate some degree of educational significance.

The training in the REWARDS strategy was effective in increasing decoding skills in all of the experimental subjects of the study. However, an increase also occurred in the control group. This increase was measured by administering a pretest and a posttest to find the difference. The difference was then used to find the mean of each group. The mean difference for the experimental group was 24.27 more word parts read from pretest to posttest, with the control group mean score of 12.9 more word parts read. Within multisyllable words, there was definitely a larger increase of word parts read in the experimental group by a margin of almost 2 to 1. Canney and Schreiner's (1976-77) research of different types of programs to teach word attack skills also supported the null hypothesis results achieved in this study, in that it does not matter how it is taught, but the fact that decoding skills are taught. Still, the experimental group was able to read word parts in multisyllable words better. Even though the probability of error was greater



than .05, it was equal to .11, and given the small sample of 16 degrees of freedom, perhaps this would be significant with a larger sample size.

The second dependent variable of reading fluency demonstrated no gains. Even though the decoding and spelling variables did show gain from the pretest to the posttest the reading fluency was not greatly effected. Students did not demonstrate marked improvement. Some subjects even demonstrated a decrease in reading fluency. This may be attributed to the lack of time for adequate practice using the strategy for chunking and decoding multisyllable words. It may be that the added time it takes to decode a word, which was previously skipped over, slowed down the words per minute in the short term. It would be interesting to do a follow-up fluency measurement taking into account number of errors and, in addition, advances in grade levels attained in reading comprehension. A temporary slow down in reading comprehension was also noted in Lenz and Hughes's study (1990) using the DISSECT method for decoding larger words.

The best result of the three dependent variables was found in spelling accuracy. The experimental group was taught direct spelling of word affixes, and then to hear, speak, and write vowel sounds within word parts. The REWARDS program practiced both expressive and receptive language. All students, except two, of the control group worked two or more days per week on the Academy of Reading. This program only taught receptive language skills. With the use of a *t*-test, the analysis of the pre/post spelling accuracy variable was significant at a rate of .09 probability of error for 17 degrees of freedom. Even though this was not at the  $< .05$  rate, it again may be more significant with a larger sample size.

The most surprising result came from the pretest to generalization test in spelling accuracy. The *t*-test yielded a probability of error rate of  $< .002$ . This is a statistically significant score. However, due to the small sample number, caution must be taken to draw conclusions. Was it a fluke? Did the experimental group have additional time to internalize the strategy taught? Further research is needed.

Each of these levels of significance is truly hard to determine due to the small sample number, but the significant rate is fairly low considering the small sample number. The REWARDS strategy did improve students' decoding and spelling skills in a single twenty-lesson program. However, the important findings may still exist in further analysis of the data comparing all dependent variables together at one time, which is beyond the scope of this current research project.

### Conclusion

Even though the null hypothesis was accepted, this program may have educational merit. This strategy was easily and quickly taught to students who lacked decoding skills and accurate spelling skills. It gave individuals the knowledge of word parts and reviewed vowel sounds within multisyllable words. Students practiced both expressive and receptive language, thus combining reading and writing, which is commensurate with current research. The only drawback occurred with reading fluency. It did not, in the short-term, increase reading fluency, even though fluency was practiced during the last seven lessons. The posttest reading fluency in some cases even decreased. This may show that another method of reading practice may be necessary for fluency to increase. For the classroom, giving middle school students with reading difficulties a strategy to decode

and spell more accurately is worth the time spent, even though an alternative is needed for fluency.

### Recommendations and Implications

Further research is needed to truly determine the significance of this strategy for decoding and spelling multisyllable words. The size of the sample had a great effect on the level of statistical significance. As a plausible explanation for sample size, the data from the spelling results were tripled and another *t*-test of statistical analysis was done to find the level of significance. The result was ( $t(56) 3.20, p < .001$ ). This suggests that another replicated study, with a pre-post test design, be done on a larger scale over the period of a school year. This larger and longer study would give subjects time to internalize the “chunking” strategy and allow time for fluency to increase over several months after the intervention was finished. The suggested timeline would be to teach the 20 lessons of the REWARDS program after initial pretesting is done in the fall, followed by initial posttests, then continuing with extensive reading fluency and comprehension practice throughout the second half of the school year, and ending with final posttests at the end of the school year.

Finally, while positive results in increased decoding and spelling skills were found in most students, a few students showed very little gains, demonstrating that another strategy for teaching reading skills is needed for those students. The student may not be appropriately placed at the correct stage of reading or spelling development to gain from this learning strategy. Further testing should be done to determine if the program is appropriate for the student. For example, where is the deficit in reading, is it at the

phoneme level, phonic level, sight word or fluency level, or is comprehension blocked for some other reason with the previously stated areas in tact? Additional research is required before any results of this endeavor can be thought of as significant, thus leaving the author with many more questions than answers.

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# APPENDIX A: PRE/POSTTEST SPELLING TEACHER RECORDING FORM

Word	Word Parts Correct (Cross out correctly spelled word parts)	Word Correct (+) Incorrect (-)
1. consider	1. con sid er 3	
2. distasteful	2. dis taste ful 3	
3. promotion	3. pro mo tion 3	
4. abnormal	4. ab norm al 3	
5. continent	5. con tin ent 3	
6. argument	6. ar gu ment 3	
7. disturbance	7. dis turb ance 3	
8. comprehensive	8. com pre hen sive 4	
9. expressionless	9. ex pres sion less 4	
10. meaningfulness	10. mean ing ful ness 4	
11. entertainment	11. en ter tain ment 4	
12. unavoidable	12. un a void able 4	
13. circumstantial	13. cir cum stan tial 4	
14. glamorously	14. glam or ous ly 4	
15. confederate	15. con fed er ate 4	
16. astonishingly	16. a ston ish ing ly 5	
17. instrumentalist	17. in stru ment al ly 5	
18. fundamentally	18. fun da ment al ly 5	
19. impractically	19. im pract ic al ly 5	
20. communication	20. com mun i ca tion 5	
	Total number of correct letters ____/78 Percentage correct ____%	Total correct words ____/20 ____%

[Adapted from the REWARDS Pre/Posttest by Archer, A., Gleason, M., & Vachon, V. (2000)]

## APPENDIX B: GENERALIZATION SPELLING TEACHER RECORDING FORM

Word	Word Parts Correct (Cross out correctly spelled word parts)	Word Correct (+) Incorrect (-)
1. impression	1. im pres sion 3	
2. communism	2. com mun ism 3	
3. bedazzle	3. be dazz le 3	
4. conference	4. con fer ence 3	
5. refreshments	5. re fresh ments 3	
6. miserable	6. mis er able 3	
7. donation	7. do na tion 3	
8. comprehensive	8. ex pen sive ly 4	
9. development	9. de vel op ment 4	
10. admiration	10. ad mir a tion 4	
11. competitor	11. com pet it or 4	
12. affectionate	12. af fec tion ate 4	
13. confidential	13. con fid en tial 4	
14. explosively	14. ex plo sive ly 4	
15. hospitality	15. hos pit al ity 4	
16. occasionally	16. oc ca sion al ly 4	
17. misrepresenting	17. mis rep re sent ing 5	
18. enthusiastic	18. en thu si ast ic 5	
19. international	19. in ter na tion al 5	
20. irregularity	20. ir reg u lar ity 5	
	Total number of correct letters ____/78 Percentage correct ____%	Total correct words ____/20 ____%

[Adapted from the REWARDS Generalization Test by Archer, A., Gleason, M., &amp; Vachon, V. (2000)]