

The Effects of Word Sorting
on Spelling Retention

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Jennifer L. Cook

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CHAPTER 1: INTRODUCTION

Schools across the country employ a wide variety of teaching methods and programs for spelling, from published basal spelling programs to teacher-created individualized spelling lists (Traynelis-Yurek & Strong, 1999). Despite the variety of techniques used in spelling instruction, one unifying theme among teachers is dissatisfaction with the spelling instruction they are offering students. Of the 42 second through fifth grade teachers surveyed by Johnston (2001), 74 percent of them thought that children are spelling worse today than they have in the past and that spelling instruction is not adequately addressed in the elementary curriculum. One complaint many teachers make is that spelling retention is not adequate (Johnston, 2001). For example, Templeton and Morris (1999) reported that students who memorize the spelling words with 90 percent accuracy on a weekly posttest are unable to understand the underlying patterns of the language. This pattern knowledge is essential for long-term spelling effectiveness (Templeton & Morris, 1999).

One reason for the dissatisfaction teachers feel towards spelling may be that the teachers do not adequately understand how children learn to spell (Templeton & Morris, 1999). Many researchers agree that spelling is a developmental process in which children build upon prior knowledge of words to develop their understanding of the way words are spelled (Abbott, 2000; Bear, Invernizzi, Johnston, & Templeton, 1996; Bear & Templeton, 1998; Ganske, 1999; Johnston, 1999). Orthographic knowledge develops from letters and sounds, to letter patterns and syllable patterns, to meaning represented through spelling (Abbott, 2000; Bear & Templeton, 1998; Ganske, 1999). “The challenge ahead is to blend our understanding of the developing learner with a better understanding of the system to be learned,” in this case, spelling (Templeton & Morris, 1999).

Word study, specifically word sorting, has emerged as one method that meets the challenge. Bear and Templeton (1998) explain that word study combines phonics, spelling, and vocabulary instruction. Students engage in problem solving activities that are at the student's developmental level. Student achievement on assessments improved when word study activities are used (Brandt & Gielbelhaus, 2000; Elliott & Rietschel, 1999; Fresch, Wheaton & Zutell, 1998; Fresch, 2000; Joseph, 2000, 2002). The existing research does not, however, address the long-term retention of the words studied. In this study, fourth and fifth grade students participated in word sorting activities. The effect of word sorting on spelling retention was measured.

Statement of Problem

The purpose of the study was to determine the effects of word sorting activities on spelling retention of fourth and fifth grade students.

Research Question

What is the effect of word sorting activities on the spelling retention of fourth and fifth grade students?

Null-Hypothesis

Word sorting activities in spelling will have no effect on fourth and fifth grade student retention.

Definitions of terms

For the purpose of the study, the following terms will be defined:

1. *Closed sort* – A classification of words using predetermined categories (Ganske, 2000). Developmental spelling - “Children progress in their knowledge of the English spelling system from concrete letters and sounds to more abstract pattern and meaning relationships” (Ganske, 2000, p. 325).
2. *Derivational Constancy spelling stage* – “The last stage of spelling development. Spellers study relationships between *derived* forms of words – namely, between words that share a common root. They learn that many spelling patterns remain constant across derived forms despite changes in sound. The *g* in *sign* is retained because of its meaning connection with *signal*” (Ganske, 2000, p. 325).
3. *Environmental print* – print that is displayed on classroom walls, signs, product boxes, posters, word walls, etc.
4. *ESL students* – Children learning English as a second language.
5. **Flexible groups** – ***Children are grouped based on developmental spelling level, but groups may change several times throughout the school year.***
6. *Key words* - “Words or pictures that are used as category headers during word sorts. They clearly reflect the feature represented by the category” (Ganske, 2000, p. 327).
7. *Letter Name spelling stage* – “The second stage of spelling development in which students begin to represent beginning, middle and ending sounds with letters that are phonetically accurate. Letter choice is often based on the sound of the letter’s *name* rather than on the more abstract letter-sound association. Thus, *y* may be used to represent the first sound in *wet* because the letter’s name produces a “wuh” sound. The name of the correct letter *w* (“double-u”), bears no resemblance to the desired sound” (Ganske, 2000, p. 327).

8. *Open sorts* – “A categorizing of words or pictures according to a student’s own judgement” (Ganske, 2000, p. 327).
9. *Orthographic/Orthography* – “Literally, ‘straight’ or ‘correct’ (*ortho*) ‘writing’ (*graphy*). Orthography refers to the writing system of a language. Some writing systems are based on ordered characters or symbols. English orthography relies on correct sequences of letters, standard spelling” (Ganske, 2000, p. 327).
10. *Phoneme* – The smallest unit of speech that distinguishes one word from another. For example, the *t* in *tug* and the *r* of *rug* are two English phonemes (Bear et al., 1996).
11. *Phonology* – the study of speech sounds and their relationships to letters in words.
12. *Spelling retention* – A child’s ability to recall the accurate spelling of a word after some time has passed.
13. *Syllable Juncture spelling stage* – “The fourth stage in spelling development. Students work with words of more than one syllable. They learn how syllables join and when to double a final consonant or drop a final *e*; they also learn to extend their vowel pattern knowledge and to correctly represent vowel sounds in unstressed syllables” (Ganske, 2000, p. 330).
14. *Within Word spelling stage* – “The third stage in spelling development. Students at this stage move beyond strict one-letter-one-sound correspondences and learn to spell by pattern. A primary instructional focus is the marking of long vowels (*gave*, *wait*, *tray*, and *vein*), but other vowel and consonant patterns also receive attention (*dart*, *boil*, *crouch*, *caught*, and *pitch*, *fudge*, and *squid*” (Ganske, 2000, p. 331).
15. *Word box* – a drawn rectangle around a word that is divided into boxes with each box containing a separate phoneme (Joseph, 2000).

16. *Word sorts* – “Compare and contrast activities in which students group like words into categories according to their sound, pattern, or meaning. Each category is usually headed by a key word. See key words” (Ganske, 2000, p. 331).
17. *Word study* – “A student-centered approach to phonics, spelling, and vocabulary instruction that actively engages the learner in constructing the concepts about the way words work” (Ganske, 2000, p. 332).

Limitations

For the purpose of the study the following limitations are noted:

1. The sample was limited to a convenience sample rather than a random sample, thus the results of this study may not be generalized to all fourth and fifth grade students.
2. Students with Individualized Education Plans may or may not have been included in the study, depending on their plans.
3. The sample was its own control group.
4. The length of the study may have been insufficient to show changes in spelling retention.
5. There may have been confounding variables that affected the results of this study that were beyond the control of the researcher.
6. The researcher had limited control over students’ prior knowledge of the words that were used on the assessment tools.

Delimitations

1. The researcher was absent on one testing date and tested a day early for the final data collection.
2. Three students did not consistently test on the same words for each test.

3. Students who were absent on testing dates did not submit three tests for each testing period.
4. One student moved out of the district.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

The purpose of this study was to determine the effects of word sorting on spelling retention of fourth and fifth grade students. The following is a summary of the related professional literature and a synthesis of its pertinence to this research. This chapter is organized in a topical pattern beginning first with a review of the thirty years of research on spelling developmental levels and the way children learn to spell. Next is a summary of a variety of spelling instruction methods and philosophies. Finally, the research specific to word sorting is reviewed.

Developmental Spelling

Recent research has encouraged educators to explicitly teach spelling generalizations to children at their developmental spelling level. Beginning with what are now known as the “Virginia Studies” in the early 1980’s, researchers under the direction of Ed Henderson of the University of Virginia explored the developmental course of spelling knowledge (Bear & Templeton, 1998). The research suggested six stages of spelling development that directly correlate with reading and writing development (Bear & Templeton, 1998).

Since the Virginia Studies, other researchers have expanded upon the findings of the original studies to better understand and fine-tune each of the developmental levels. To broaden the belief that children progress from one stage to the next, Reece and Treiman (2001) examined how the spelling process of first grade children changed from the fall to the spring. Reece and Treiman studied first graders’ letter-name vowels and r-controlled vowel spellings of non-words. They found that children progressed through smaller transitional stages when moving from one developmental spelling stage to the next. For example, when children are learning to add final “e” to long vowel words they first do not include the vowel, then use an incorrect vowel to mark

the long vowel, and, finally, approach correct spelling. These small steps occurred as the children progressed within the Letter Name stage of spelling development.

Vernhagen, Boechler and Steffler (1999) examined phonological and orthographic information, the two types of linguistic information children use during spelling. The researchers predicted a shift across grades from relying solely on phonological information to beginning to use orthographic information when spelling selected non-words that contain an ambiguous vowel. In addition, they suggested that it takes less time to spell words when relying on orthographic patterns than phonological information. Their findings indicated an increase in the number of plausible spellings as children aged. Younger children made spelling decisions based on phonological information. As children gathered more information about the English language, they began to recognize other spelling options and made spelling decisions based on comparisons of known words (Varnhagen et al., 1999).

In a study of older children, Goldsmith (1995) investigated students' word knowledge in an attempt to show the correlation between age and grade and spelling development. Goldsmith searched for a pattern of use of lower to higher order strategies in students' attempts to spell words. Her findings confirmed that older students generally used fewer lower order strategies as they acquired higher order spelling strategies (Goldsmith, 1995).

Abbott (2000) summarized the historical development of orthographic knowledge since the early 1960's and the new insights that came with the "Virginia Studies" in the 1980's. The conclusions of the study were three-fold. First, the research that shaped the pedagogic practices during the sixties may have been unreliable and need to be revisited within the newer context of word study. Second, Abbott indicated a need for orthographic generalizations to be translated into teacher-friendly language because teachers showed a lack of knowledge about the

orthographic system. More complete orthographic knowledge better equips teachers to guide children through spelling development. Third, educators need to move beyond the ideas that phonics generalizations consist only of sound-letter relationships. It is generally accepted that basic knowledge of sound-symbol relationships is a skill needed for most children to learn to read a spell. Phonics instruction has focused on only that concept, but needs to expand to an ongoing word study (Abbott, 2000).

Methodology for Teaching Spelling

The following summary of studies will outline the research of common teaching strategies for spelling including phonology-based instruction, visual training, and rule-based instruction. Also included in the summary are studies of a whole language approach and basal spelling instruction philosophies.

In a 1999 study, Traynelis-Yorek and Strong surveyed school districts and teachers from 41 states to determine whether spelling texts are still the predominant form of spelling instruction in the United States. The survey asked school districts to choose which of four basic spelling methods best described the district's approach to spelling instruction. The methods included a published spelling text, individualized spelling, developmental spelling with direct instruction, or developmental spelling without direct instruction. Traynelis-Yorek and Strong defined developmental spelling with direct instruction as words that are taught in context. "Students are evaluated in individual conferences and given direction as to the appropriate strategies which can be used for spelling the word" (Traynelis-Yorek & Strong, 1999, p. 280). In developmental spelling without direct instruction, "the child has been immersed in many various reading and writing experiences. Teaching reflects and builds upon the developmental spelling stages.

Evaluation can reveal where the child is located in the developmental stages” (Traynelis-Yorek & Strong, 1999, p. 280).

Traynelis-Yorek and Strong’s findings showed that there appeared to be no definite trend in spelling instruction across the United States. Slightly more than half (53 percent) of the school districts in the study used a published spelling text. Even after organizing the data by school district size and by region of the United States, the researchers were still unable to discern a consistent pattern for teaching spelling. They reported that the status of spelling instruction seemed unclear.

Arra and Aaron (2001) compared the effectiveness of phonology-based instruction to visual training in 93 first grade students. In the first of two studies, the researchers administered a spelling pretest and then created two groups of children. One group received visual training and the other group received linguistic training. Researchers showed ten flash cards of correctly spelled words to the children in the visual group. While looking at the word, the visual group children were instructed to say the word out loud and spelled it orally. Children in the linguistic group viewed flash cards that showed the child’s answers from the pretest with the incorrect portion of the word highlighted. The researchers provided corrective instruction by drawing attention to the misspelled vowels and consonants in the spelling errors from the pretest. The children and the researcher discussed the placement of the letters and the sounds that were missing or inserted. The children also said and spelled the word while looking at a flashcard. Upon analyzing the results, researchers detected no significant difference between the visual and linguistic groups.

In the second study, Arra and Aaron (2001) instructed the linguistic group of children in phonemic awareness, while they exposed the visual group of children to printed words only. The

children taught with phonemic awareness and linguistics methods outperformed the visual training group with gains in retention after a two-week period.

Darch, Kim, Johnson, and James (2000) conducted two studies of spelling strategies of children with learning disabilities. The first study examined the types of strategies children with learning disabilities employed and found that they frequently called on a variety of strategies that the researchers considered “inappropriate.” The second study compared the effectiveness of a rule-based approach with an activity-based approach. According to the researchers, rule-based instruction taught students to use spelling rules in a direct and uncompromising way. The activity-based program utilized writing activities based on word families, spelling practice (including organizing word pairs, writing practice, and fill-in-the-blank sentence completion), and motivational activities. The researchers concluded that left alone, children with learning disabilities were not effective in using appropriate spelling strategies so they needed to be explicitly taught the spelling rules. In this study students became more proficient spellers with the rule-based program (Darch et al., 2000).

In a published basal series, often referred to as the “traditional” method, children progress through weekly lessons that teach words that follow spelling “rules” or generalizations. Activities usually include workbook pages, defining the words and using them in sentences. Phonics and spelling are taught as separate lessons, but in conjunction with reading and writing. Each lesson stresses a particular sound or spelling unit (Bruck, Treiman, Caravolas, Genesee, & Cassar, 1998).

Rymer and Williams (2000) studied the influence of explicit spelling instruction and weekly tests on first-grade children’s independent writing. In this study researchers documented (a) words learned without explicit instruction, (b) words spelled correctly (learned) on a Friday

posttest, (c) words learned and transferred to journal writing correctly, and (d) words learned and transferred to journal incorrectly. The average number of words learned from the spelling program in eight months was 65 words. The average number of words learned without explicit instruction was 184. Spelling results were not always indicative of children's overall spelling development. Some students consistently spelled accurately on tests but showed poor spelling in their written work. Other students performed poorly on the tests but journal writing indicated more sophisticated spelling attempts. Overall, children transferred relatively few spelling words to their journals. Children did not frequently use words from the spelling list in their writing, and when they did, words were often spelled wrong.

Angelisi (2000) compared phonemic awareness, word identification teaching strategies and the traditional basal method. The researcher instructed her third grade class using the three different methods and tested them after each instruction period. The test results did not indicate much difference between methods. Angelisi focused the conclusion on the improved morale of her students while they participated in phonemic awareness and word identification tasks. The data did not clearly indicate a superior teaching method for spelling instruction.

In a 1998 study, Bruck et al. located third grade students who had either experienced all whole language instruction or all basal spelling instruction throughout their education. They studied 54 public school students that were exposed exclusively to whole language methods. The second group of children included 22 students who attended a parochial school that used phonics-based methods to teach reading and writing. These students used a spelling book, phonics book, and a basal reading series (Bruck et al., 1998).

All students in the study were given spelling tests that assessed their knowledge of a wide range of spelling patterns and orthographic structures. Researchers found that third grade

children who received explicit phonics instruction produced more accurate word spellings than third grade children who received whole language instruction. The whole language students scored lower than what was acceptable for their age level or their reading level, which suggested that the absence of explicit phonics instruction had a high negative impact on spelling (Bruck et al., 1998). They concluded that children in whole language classrooms did not progress at the same rate as children who received explicit spelling and phonics instruction.

Whole Language proponents encourage children to express themselves freely in their writing by using invented or temporary spellings. Spelling instruction in whole language classrooms occurs during shared writing or journal experiences. Brasacchio, Kuhn, and Martin (2001) studied the effects of invented spelling on a children's writing. Three first grade classes participated in the study. Researchers taught two creative writing lessons to the students. In the first lesson, students were highly encouraged to use invented or temporary spellings to produce their stories. The researchers randomly chose students to interview about how they arrived at the spellings of some of the words used in their writing. The second lesson, carried out two days later, was also a creative writing task. However, students were encouraged to use conventional spellings. Students were allowed to use environmental print, but not dictionaries to complete the assignment.

Upon analysis of the results, Brasacchio et al. observed a significant decline in the number of words the students wrote during the second assignment when compared to the first. Together, the three classes wrote 2,475 words when they were encouraged to use invented spelling. The total word count decreased to 1,592 in the second assignment when students were encouraged to spell conventionally. While this study did not address the number of words spelled correctly, it did conclude that students were able to write more freely when they were

encouraged to get their ideas on the paper without being concerned about spelling (Brasacchio et al., 2001).

When given a choice, or when districts have abandoned a published series, teachers have had to develop alternative spelling programs. Some individualized spelling programs are based on high frequency or vocabulary words (Johnston, 2001). Johnston reported that there does not seem to be any research to support these practices. When words are selected in this fashion, they fail to focus on any spelling generalizations. This forces students to learn the spelling by rote memorization.

Word Sorting

Word sorting activities provide instructors with a framework for more individualized instruction at students' developmental spelling levels. In word sorting activities, students organize word cards into columns on the basis of a shared conceptual, phonological, or orthographic feature (Zutell, 1998). Word sorting is based on four principles outlined by Zutell (1996). First, the English language is not arbitrary. There are extensive sound, visual, and meaning patterns. Second, more than rote memorization, learning to spell includes a strong conceptual component. Children learn how words work. Third, spelling development follows a set of stages in which children produce more accurate spellings and more sophisticated misspellings. Fourth, relationships are first recognized in familiar words, then extended to less familiar words, which become more memorable as the child fits the new words into the scheme of the old words (Zutell, 1996). While word study is supported by all four of the principles, the fourth principle outlines the rationale for word sorting activities.

Recent research indicates strong evidence that students in grades first through fifth show an increase in word knowledge after participating in word sorting activities. Additionally,

children with learning and cognitive disabilities participating in word sorting activities also show an increase in spelling ability (Fresch et al. 1998; Elliott & Reitschel, 1999; Brandt & Gielbelhaus, 2000; Joseph, 2000, 2002).

In 1998, Fresch et al. asked children to “think aloud” while they sorted words into categories. This allowed researchers to analyze the thought process of students as they sorted words. The results of the study implied that less sophisticated spellers placed words into categories based on either auditory or visual features of words. As spellers became more sophisticated, they chose the categories for the words based on both auditory and visual features of words, thereby suggesting that they were realizing the connection between the two. The think aloud process also gave students a reason to talk about words and use the “language of language” (long and short vowels, prefixes, suffixes, syllables, etc.).

Fresch et al. suggested that think aloud sorting can guide teachers to a better understanding of children’s misconceptions about words, which in turn drives future instruction. The developmental spelling level suggests the type of words the student needs to sort. Word sorting takes place at a less difficult level than a student’s reading or writing level. Just because a student can read and write a word does not mean that he or she can accurately analyze the word in relation to spelling patterns. Finally, when word sorts are designed to teach toward strengths, students are able to build on prior knowledge and develop new approaches for spelling words (Fresch et al., 1998).

In 1999, Elliott and Reitschel studied the effects of word study on second grade students’ application of spelling and phonics in their independent writing. To assess students’ developmental spelling levels, researchers used a spelling inventory designed by Donald Bear in

Words Their Way (1996). Elliott and Reitschel used the results of the spelling inventory to guide the formation of instructional groups. Each researcher instructed four developmental groups for two or three forty-five minute sessions a week. The word study activities that were used included word sorting, word hunts, games, making words, and reading books and poems at the appropriate developmental level. The spelling inventory, writing samples from journals, and a survey provided data for this study. The results indicated progress by all students in their word knowledge with the greatest gains made by the ESL students. The survey showed that students of all academic levels found word study activities to be meaningful and enjoyable (Elliott and Reitschel, 1999).

Joseph (2000) compared the effectiveness of word sorts, word box activities and traditional spelling instruction. First graders who participated in word sorting activities outperformed other students who experienced word box activities or a traditional spelling approach. For each group of students, Joseph examined phonemic segmentation, phonemic blending, pseudo-word naming, word identification, and spelling. Found to be more effective for improving children's early literacy skills than the traditional method, word study activities engaged and interested the students. Joseph noted that children in the word sorting groups self-monitored and self-corrected more frequently than children in other groups. According to Joseph, comprehensive literacy programs recommend the inclusion of combined word sort and word box activities (Joseph, 2000).

In 2002, Joseph completed a similar study of children with mild cognitive disabilities. In this study, Joseph tested the effectiveness of a combination of word sorting and word boxes instruction on word identification and spelling. All students demonstrated an increase in

performance relative to baseline conditions for both word reading and spelling after implementation of combined word box and word sorting activities (Joseph, 2002).

Brandt and Gielbelhaus (2000) used Ganske's Developmental Spelling Analysis (1999), similar to Bear's spelling inventory (1996), to determine developmental spelling levels of children with developmental handicaps. They used the analysis to drive instruction as they offered hands-on word study experiences at the developmental levels of the students.

Achievement with word study was measured against achievement with a traditional basal-spelling approach. A posttest using the same Developmental Spelling Analysis indicated significant improvement in spelling, suggesting that the use of word study activities increases spelling achievement (Brandt & Gielbelhaus, 2000).

Summary

The last thirty years of research shows that children progress through stages of orthographic knowledge, from letters and sounds, to letter patterns and syllable patterns, to meaning represented through spelling (Abbott, 2000; Bear & Templeton, 1998; Ganske, 1999). The knowledge of these stages causes educators to rethink traditional spelling programs in which all children study the same spelling words and take a Friday test.

The emphasis on memorization in traditional programs and the lack of systematic instruction in whole language approaches result in a decline in spelling achievement and word knowledge (Arra & Aaron, 2001; Bruck et al., 1998; Rymer & Williams, 2000). Further, children learn new concepts based on what they already understand. Word sorting provides opportunities for children to study the phonology and orthography of words and apply prior knowledge of patterns to new words. Word knowledge increases with the combination of teaching to children's developmental spelling level and using a hands-on word study

approach. This study will examine the effects of word sorting on the spelling retention of fourth and fifth grade students.

CHAPTER 3: PROCEDURES

Research Design

The purpose of this study was to examine the effects of word sorting on the spelling retention of fourth and fifth grade students. The design of this study was a quasi-experimental program study producing quantitative data. Data was collected from Screening Inventory and Feature Inventory placement tests and spelling posttests. For this study, the sample group served as both the control group and the experimental group.

The spelling instruction that the sample group has received in previous years has mainly included individualized spelling word lists that reflect a similar spelling generalization. The control group used the following individualized spelling program. A spelling pretest administered on the Monday of Control Week 1 included words containing the long /a/ sound. Forty-eight words were chosen from the spelling text series that is offered, but not required, by the school district. Sixteen words were from the fourth grade spelling text, 16 words were from the fifth grade spelling text, and the remaining 16 words were chosen from the sixth through eighth grade spelling texts for an additional challenge.

To administer the pretest (see Appendix A), words were dictated once, used in a sentence, and dictated again. After the first sixteen words, students checked their spelling. If the students had at least ten misspellings at this time, they stopped taking the pretest. Those who did not have ten misspellings continued the pretest, stopping to correct after the next set of sixteen. All students created a list of ten words from their misspellings to study for a Friday posttest. Activities during the week included sentence writing, oral practice tests with partners, and “Look, Say, Cover, Write,” a writing and visual memorization strategy. A posttest was administered on the Friday of Control Week 1. Subsequent posttests were

administered on the Fridays of Control Week 3 and Control Week 5 to determine students' retention of accurate spelling.

A transition phase took place from the Control Week 4 in October until the beginning of the experiment period in January. During this time, students learned how to analyze words using word sorting activities. Without this transition period, students would have most likely continued to memorize the spelling of words and the sorting categories for a Friday test.

During Control Weeks 2 and 3 a Screening Inventory (see Appendices B-C) and Feature Inventory (see Appendices D-G) were administered to determine the developmental level of spelling for each student. Students were placed into groups and received word sorting instruction based on their developmental level. The developmental levels include Letter Name, Within Word, Syllable Juncture, or Derivational Constancy.

Since the word sorting activities began before the control period was finished, the words for the word sorting were carefully selected so as not to interfere with the retention of the control words. Data collection for spelling retention with word sorting activities began on Monday, January 6 with the first posttest on Friday, January 10.

The students in each developmental group were given the same twenty word cards. The words were selected to reflect a certain orthographic feature from the group's developmental level. Some of the cards represented the intended feature to be studied, while the other category(s) contained words that contrasted the feature being taught. For example, students in the Within Word group were learning how to spell *r-controlled* i words. They received words that were sorted into *ir r-controlled*, long /i/ spelled *i-consonant-e*, and short /i/ sounds. Students had an opportunity to do an open sort in which they placed the word cards into categories of their choice. The researcher then guided the students in a closed sort to

demonstrate the categories that focused on the characteristics of *r-controlled i*. After the closed sort, students chose twelve words, some from each category, to practice for the Friday posttest. Students copied their individual list and submitted it to the researcher. To reflect the needs of the students at that time, the researcher selected the words and sorting categories at the end of the week before the experiment week began. The set of words for each of the three developmental levels is included in Appendices H.

Each day of the week, students practiced the word sort and spelling in a variety of ways. On Tuesday, partners worked together to practice the sort and the spelling by trading cards and calling the words to each other. When one partner received a word, s/he spelled the word orally while the partner checked for accuracy. Then the child took his/her card and began a sorting pile (for example, long /i/ or short /i/). Each time the student spelled the word correctly, s/he placed the card to the correct sorting category. Partners consulted their Word Study notebook to check for accuracy of the sorting categories.

On Wednesday, students participated in a game similar to a traditional concentration game. Partners from the same feature group used one set of cards and laid them face down on the floor in a four by five array. Partners took turns turning over two cards and determined if the words were from the same category (for example, mice and *spine* are from the same sorting category because they both have the long /i/ sound with the *i-consonant-e* spelling pattern). The student kept the pair if the cards were from the same sorting category.

Students did a writing sort on Thursday. The procedure was the same as the partner sort from Monday, except that students wrote the words in the categories on paper instead of spelling orally and sorting the cards.

The experiment portion of the study included three posttests. The first posttest occurred on the Friday of Experiment Week 1. Subsequent posttests occurred on the Fridays of Experiment Weeks 3 and 5 to determine the retention of spelling accuracy.

Students continued to receive word sorting instruction at individual students' developmental spelling level during the weeks after the experiment week. A summary of the results follows in Chapter 4 followed by an interpretation of those results in Chapter 5.

Sample Description

The subjects of this study were students in a convenience sample chosen from the researcher's classroom. The sample came from the Oshkosh Area School District, located in Winnebago County, in the east central region of Wisconsin. The Oshkosh Area School District (OASD) is the ninth largest school district in the state of Wisconsin. OASD consists of seventeen elementary schools, five middle schools, and two high schools. The 2002-2003 elementary enrollment was 4,741; the middle school level was 2,399; and the high school level was 3,413. The population of the city of Oshkosh is approximately 63,225. The main manufacturing employer is Bemis (a packaging tape and plastic film manufacturer), and the main non-manufacturing employer is the University of Wisconsin, Oshkosh.

Carl Traeger Elementary School houses 525 students in kindergarten through fifth grade. There are 180 fourth and fifth grade students in the school, and 42 were included in the sample class. Caucasians constitute 95 percent of the student body. The remainder of the student body population includes one percent Black, one percent Hispanic, two percent Asian, and one percent Native American. Eight students receive reduced lunch and 39 receive free lunch.

The sample classroom consisted of 98 percent Caucasian students and two percent Hispanic. Five percent of the students in the sample received free or reduced lunch. Two students received special education services for Emotion/Behavior Disorders. Two students from the sample were treated for Attention Deficit Disorder. Five students received Gifted and Talented services for reading and language. The sample consisted of 23 males and 19 females. As of November 1, 2002, students range in age from nine to twelve years old. Seventy-eight percent of the students lived in a home with both biological parents; nine percent lived with one parent; 11 percent lived with a parent and a stepparent; and two percent lived half of the time with each parent. As outlined in their Individualized Education Plans, students with Learning Disabilities were not included in this study.

Instruments

The instrument for the control portion of the study was an individualized spelling test based on a specific spelling generalization. The researcher administered the pretest to all of the students by dictating a word, using it in a sentence, and dictating the word again. For each of the posttests, students administered the posttests to a partner student by dictating the list to the partner. Students received one point for each correctly spelled word and the score was reported as a percent.

Researchers have developed spelling inventories for the purpose of determining a child's stage of spelling development (Bear et al., 1996; Ganske, 2000). Ganske completed a study that developed and tested the reliability of the Developmental Spelling Analysis (DSA). The DSA is an assessment tool that helps teachers interpret children's spelling for meaningful instruction (1999). The DSA includes a Screening Inventory for determining a child's stage of development and a Feature Inventory to highlight the strengths and weaknesses in a

child's knowledge of spelling. Ganske's study concluded that teachers using the DSA attained insights about their students' orthographic knowledge and were able to tailor instruction to the needs of the students. For this reason, this researcher used assessment and word sorting methods outlined in Ganske's Word Journeys (2000).

To determine the developmental spelling level of each student, a Screening Inventory and Feature Inventory (Ganske, 2000) was administered to each student. The purpose of the Screening Inventory (see Appendix B) was to determine the appropriate portion of the Feature Inventory (see Appendices D-G) to be given to each student (Ganske, 2000). A point was scored for each correctly spelled word and a predicted stage of development was determined based on the table in Appendix C. Form A of the Feature Inventory was given to each student, although the starting point for each student varied based on the results from the Screening Inventory. The results from the Feature Inventories determined the groups into which students were placed.

The final instrument was a word sorting spelling test. Students randomly dictated the words from individualized feature lists to a partner. The student being tested wrote the words on a piece of paper, sorting them into feature categories. For the purpose of this study, students were scored one point for each correctly spelled word to determine the retention of accurate spelling. Correct placement into feature categories was not scored for this study.

Data Analysis

Data was collected from the Screening Inventory and Feature Inventory of the DSA (Ganske, 1999) and weekly student posttests. Three posttests were administered on the Fridays of the first, third and fifth week for the control and the experimental group. Data was used to determine whether students had better retention of the words practiced with visual

and memorization strategies or of words sorted into categories based on orthographic features. The data is reported in both table and narrative form in Chapter 4 of this report. A t-test analysis was used to determine whether or not word sorting activities improved the students' spelling retention.

Calendar

The researcher followed this timetable in conducting the research:

Control:

- September 30 – Administered pretest for long /a/ words from text.
- September 30 -October 3 – Students do practice activities for individualized words.
- October 4 – Individualized words from text Posttest 1.
- October 18 – Individualized words from text posttest 2.
- November 1 – Individualized words from text posttest 3.

Transition phase:

- October through December - Word Sorting group instruction.

Experiment:

- October 7-18 – Administer Screening and Feature Inventories.
- January 10 – Word sorting posttest 1.
- January 24 – Word sorting posttest 2.
- February 7 – Word sorting posttest 3.
- February - Analyze data.
- March-May - Write chapters 4 and 5.
- June 1—Final draft of research paper due.

Budget

The cost of this study was minimal.

CHAPTER 4: RESULTS

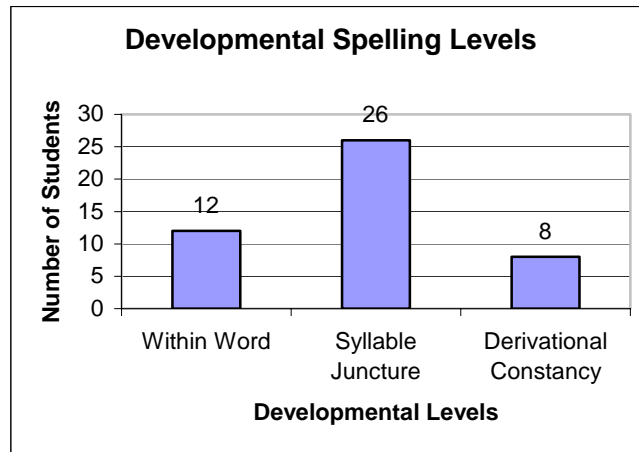
Introduction

The purpose of this study was to determine the effects of word sorting activities on spelling retention of fourth and fifth grade students. It was a quasi-experimental study of a convenience sample consisting of forty-two fourth and fifth grade students at Carl Traeger Elementary School in Oshkosh, Wisconsin. Specifically, the research question under study was as follows: What is the effect of word sorting activities on the spelling retention of fourth and fifth grade students?

During the Control portion, the subjects received a “traditional” individualized spelling pretest in which words were dictated from a general list of words of varying difficulty. Students then selected 10 misspelled words from the pretest to practice for a posttest on Friday. Subsequent posttests were administered on the Fridays of the third and fifth weeks after the pretest of the control period to determine a trend in retention.

The Experiment portion began with screening tests to determine each student’s developmental spelling level. Once determined, the researcher placed students into groups based on similar instructional needs. Students tested into the Within Word developmental level, the Syllable Juncture level, and the Derivational Constancy level. Figure 1 shows the breakdown of students into the three levels.

Figure 1. Developmental spelling levels of students.



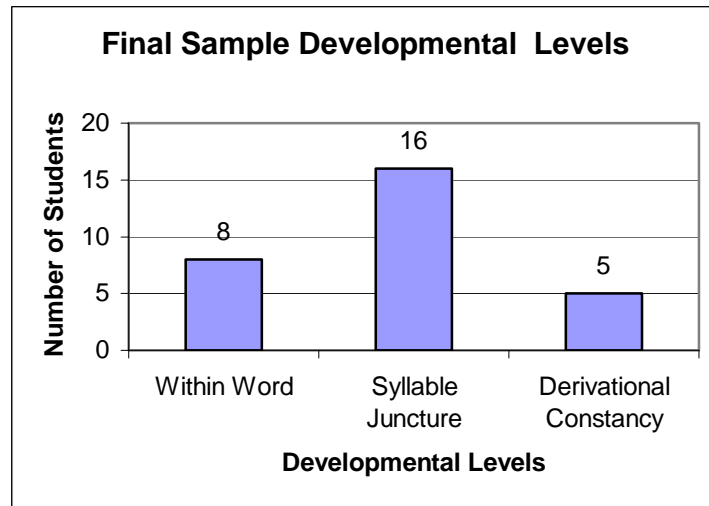
Word sorting instruction began each week with an open sort. Students received word cards at the appropriate developmental spelling level, analyzed and sorted the words independently. Then the researcher met with each group and instructed the students on the orthography of the words in each set. Discussion topics included the spellings of vowel sounds, definitions of unfamiliar words, breaking words into syllables, accented syllables, and derivations of words. Each group analyzed the word cards, noted similarities and differences between words, and generated rules or patterns for spelling. Student partners administered the tests at the end of the first, third and fifth weeks of the Experiment.

Qualitative Results

Prior to statistical analysis of the data, 13 of the original 42 subjects were removed from the study for various reasons. Student absences or missing tests resulted in the removal of six students. One student did not consistently use the same word list for all three tests during the Experiment. Two students did not consistently test the same number of words for the three Experiment tests. One student used the wrong word list for one of the Experiment tests. Three students had a combination of the errors listed above. The final sample of students included

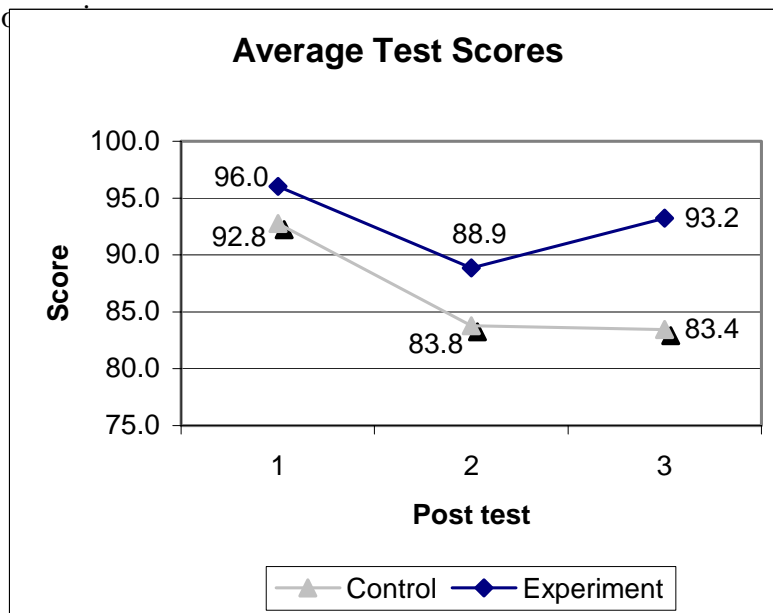
eight students in the Within Word level, 16 in the Syllable Juncture level, and five in the Derivational Constancy level (see Figure 2).

Figure 2. Developmental spelling levels of the final sample.



In order to determine whether word sorting had an effect on spelling retention, the test scores were compared. Analysis showed test scores decreased from the first to the second test in both the Control and Experiment portions of the study. The Experiment scores increased from the second to the third test while the Control scores continued to decline slightly. The average test scores for the third test of the Experiment did not, however, rebound to the level of the first test (see Figure 3).

Figure 3. Test scores



A paired t-test was used to analyze the data since the same group of students was used for both the Control and Experiment portions of this study. A hypothesized mean difference of 0 (zero) was used since the null hypothesis of the study stated that word sorting would have no effect on spelling retention as compared to traditional individualized spelling lists. The critical value for 29 observations is 2.048. After analysis, the paired t-test showed that the Experiment was significantly different than the Control at the 95% confidence level ($p=0.05$). The t-stat of 2.312 exceeds the critical value, as shown in Table 1.

Table 1.

Statistical Analysis for Mean Test Scores

	Control	Experiment
Mean Test Scores	86.67	92.71
Variance	206.35	71.40
Observations	29	29
Hypothesized Mean Difference		0
df		28
t Stat		2.312
P(T<=t) two-tail		0.028
t Critical two-tail		2.048

A paired t-test was used to analyze the change in mean test scores from the second to the third posttests of the Control. After analysis, the t Stat of 0.722 showed that the test scores from

the second posttest to the third posttest in the Control portion of the study were not significantly different at the 95% confidence level ($p=0.05$). The t-stat of 0.722 does not exceed the critical value of 2.048 for 29 observations, as shown in Table 2.

Table 2.

Statistical Analysis of Second and Third Control Mean Test Scores

	Second Posttest	Third Posttest
Control Mean Test Scores	85.52	83.45
Variance	261.33	323.40
Observations	29	29
Hypothesized Mean Difference		0
df		28
t Stat		0.722
P(T<=t) two-tail		0.477
t Critical two-tail		2.048

A paired t-test was used to analyze the change in mean test scores from the second to the third posttests of the Experiment. The t-stat of 2.197 showed that the test scores from the second posttest to the third posttest in the Experiment portion of the study were significantly different at the 95% confidence level ($p=0.05$). The 2.197 t-stat exceeds the critical value of 2.048 for 29 observations, as shown in Table 3.

Table 3.

Statistical Analysis of Second and Third Experiment Mean Test Scores

	Second	
	Posttest	<i>Third Posttest</i>
Experiment Mean Test Scores	93.21	88.83
Variance	95.31	229.00
Observations	29	29
Hypothesized Mean Difference		0
df		28
t Stat		2.197
P(T<=t) two-tail		0.036
t Critical two-tail		2.048

Summary

In summary, the t-test results show a significant difference in mean test scores between the Control and the Experiment. Mean test scores for the Control showed a decline over time, while the mean test scores for the Experiment remained significantly higher over time. In addition, the mean test scores from the second to the third posttest of the Experiment showed a significant increase, whereas the mean test scores from the second to the third posttest of the Control showed no significant change. Further discussion of the results and connections to previous research follow in Chapter 5.

CHAPTER 5: CONCLUSION

Introduction

The purpose of this study was to determine the effects of word sorting activities on spelling retention of fourth and fifth grade students. This chapter will attempt to draw conclusions based on the results of the study. The contents of this section include a discussion of the quantitative analysis, the researcher's reactions to the results, recommendations for implementing word sorting instruction, and recommendations for future studies.

Discussion

The results of this study were two-fold. First, the mean test scores of the Experiment remained consistently higher than the mean test scores of the Control. Second, while the mean test scores declined from the first to the second tests in both the Control and the Experiment portions of the study, the mean test scores for the Experiment increased significantly from the second to the third posttest. The mean test scores during the Control portion did not change significantly from the second to the third posttests. T-test results verified that the Experiment test scores were significantly higher than the Control test scores and that the Experiment test scores increased significantly from the second to the third posttest.

The overall higher mean test scores in the Experiment suggest increased spelling retention. Since the researcher divided students into developmental spelling groups for word sorting, the students studied words at their developmental spelling level. Henderson and Beers (1980) and Bear and Templeton (1998) describe the natural orthographic development and indicated the progression through stages of spelling development from concrete spelling (phonetic) to more abstract spelling. Varnhagen, Boechler, and Steffler (1999) found that as

children develop as spellers, they progress from a sole reliance on phonology to a combination of phonographic and orthographic knowledge based on analogies to other words they know. The individualized list method utilized during the Control introduced students to different spelling concepts each week that did not follow a particular sequential pattern or build upon previous weeks. By practicing words at their developmental spelling level during the Experiment, students followed a research-based sequence of spelling generalizations and built new knowledge based on prior spelling knowledge.

The nature of word sorting is to analyze the similarities and differences in words. During the Experiment, pretests were not used to generate weekly spelling lists. Instead, the activities in the Experiment portion of this study encouraged children to build upon prior knowledge about words by creating categories of similar words. The subjects learned to apply a spelling generalization to guide them in the spelling of all words in the category. This constructivist approach encouraged “scaffolding” of learning based on prior knowledge. With scaffolding, teachers provide activities at the child’s developmental level to support the child in learning a task. Scaffolding may have contributed to the consistently higher test scores during the Experiment. These findings are consistent with research by Zutell that indicates spelling relationships are first recognized in familiar words, then extended to less familiar words, which become more memorable as the child fits the new words into the scheme of the old words (1996). Teaching students at their developmental level and following a research-based sequence of spelling development appears to result in longer spelling retention as evidenced by higher test scores.

A possible explanation for the lower test scores during the Control portion of the study is that the words given to each student on the pretest were not at the children’s developmental

level. The pretest at the beginning of the Control period was designed with 48 words that increased in difficulty. The first 16 words were selected from the district's fourth grade spelling text; the second 16 were selected from the fifth grade text; and the final 16 words were selected from the sixth through eighth grade texts. The students chose individualized lists from the misspelled words on their pretests. The words chosen by the students may have been too difficult. Using words from the district's adopted spelling text assumes that all students are at least at the spelling level of the fourth grade text.

While the intent of creating a word list with words from the fourth through eighth grade texts was to allow for a wide range of spelling abilities, the word lists from spelling text books did not allow a wide enough range of differences in developmental levels. This implies that traditional spelling text series, when used as intended by the publisher, may not be developmentally appropriate for children because not all children will be at the "just right" developmental level for the list in the text.

The Experiment test scores and the Control test scores declined from the first posttest to the second posttest. The Experiment test scores significantly increased from the second to the third posttest while the Control test scores showed no significant change from the second to third posttest. Word sorting instruction included conversations about spelling generalizations for vowel sounds, accented syllables, and suffixes. Students may have gained a deeper understanding of words and the English language. Students seemed to remember how to spell a higher number of words after time had passed than they did when they did not do word sorting activities. These results are consistent with a study by Brandt and Gielbelhaus (2000) who used Ganske's Developmental Spelling Analysis and word sorting methods (1999), the same analysis

and methods used in this study. Brandt and Gielbelhaus (2000) concluded that children showed a significant improvement in spelling when word sorting was utilized.

Rote Learning may have also contributed to the decline in test scores during the Control portion of the study. Although students had been exposed to individualized spelling lists in previous school years, they were exposed to this method of instruction for only one week during this study. Students may have learned the spelling of the words on the list during that week of instruction, but they may not have understood the spelling generalizations. The instruction methods during the Control week and in previous years relied mainly on memorization strategies resulting in rote learning. Mayer (2002) defines rote learning as students who can remember correct answers, but do not understand concepts and are unable to apply the information later. This could account for the decline in correct spelling retention during the Control.

An isolated analysis of the Experiment mean test score showed an interesting trend. The mean test scores for the Experiment started at 96.0%, dropped to 88.9%, and then rose to 93.2%. One possible reason for the dip in scores could be that word sorting was still a relatively new method for the students. As the students got more comfortable with the methods, the scores went back up. In addition, the nature of word sorting instruction, as outlined by Ganske (1996), is that students study a particular feature for several weeks before learning a new feature. Since each word sort builds upon the previous lesson, students had been still studying the same feature three to five weeks after the original test date. Over that time, students may have gained a deeper understanding of the feature they studied during the first Experiment week. This may explain the rebound in test scores.

Researcher's Reactions

One of the first conclusions that the researcher made after learning about students' developmental spelling levels was that the spelling pretests historically used were far too difficult for many of the students. The researcher realized very quickly after administering the screening inventory that many of the students had significant "holes" in spelling development and required specific instruction at a remedial level to bring them up to grade level. Scaffolding was not possible because the students lacked the understanding of spelling generalizations from earlier years. The pretests that had been used in the past were not meeting the needs of the students despite the individualized approach.

It is the researcher's professional opinion that the observed change in the students over the course of the study was impressive. During the first few weeks, students still seemed to be trying to memorize spellings as they had before. With the word sorting method, they tried to memorize words in the categories without trying to understand the spelling generalizations for each category. After several weeks, there was a noticeable change in the way students were participating in the word sorting lessons on Mondays. Students asked more detailed questions, wanting to know *why* words were sorted into the particular categories. Some even came back to school on Tuesday and wanted to hear the explanation again. Instead of memorizing the lists, they questioned why words were sorted together. Students realized that they studied features for several weeks and they began to start their open sort by trying to see if the sort was similar to last week's sort. Many times some of the categories remained the same with only one new category to learn. Students constructed new learning based on knowledge they gained in previous weeks.

Students in the Derivational Constancy group showed that they were challenged by word sorting through their insightful conversations. The students in this group are the truly gifted

spellers in the class. They naturally seem to know how to spell many words and have had very little challenge in previous spelling programs, aside from trying to find the most obscure words to add to their individualized lists. Often the words these students chose rarely occurred in the books they read, and they would use them in their writing even more infrequently. During word sorting, this group often monopolized the researcher's time simply because of their interest in the sorting and desire to know how words work. The Derivational Constancy group often received word lists and were "stumped" as to how to sort them, only to find that they did not at first recognize derivative word pairs in the list. They learned to analyze how words change from one form to the next and developed strategies for spelling and defining words based on other forms of the word. The group that is often difficult to challenge was challenged with word sorting.

Summary and Future Implications

In this study, the researcher examined the effect of word sorting activities on the spelling retention of fourth and fifth grade students. During the Control portion, the subjects received a spelling pretest in which words were dictated from a general list of words at varying difficulty. Students then selected 10 misspelled words from the pretest to practice and posttest on Friday. Subsequent posttests were administered on the Fridays of the third and fifth weeks after the pretest of the control period to determine a trend in retention.

The Experiment portion began with screening tests to determine each student's developmental spelling level. Once determined, the researcher placed students into groups based on similar instructional needs. Upon analysis of the results, 13 students were removed from the study for various reasons. The final sample of students consisted of eight students in the Within Word developmental level 16 students in the Syllable Juncture Level, and five students in the

Derivational Constancy Level. Students participated in word sorting activities and tested on the first, third, and fifth Fridays after the Experiment began.

The researcher concluded that there was a significant change in the spelling retention when students participated in word sorting activities. Test data showed a significant increase in spelling retention based on mean test scores. Students were more engaged in word sorting activities and had more in-depth conversations about the nature of words. Word sorting gave students opportunities to discuss definitions of unfamiliar words, learn about syllables and accents, and make connections between derivatives of words. There remain areas of this study, however, that require improvement or allow for more intense study.

Because the word sorting method provides instruction at spelling levels from pre-literate through Latin derivatives, the researcher recommends that all students from a class participate in word sorting instruction, regardless of ability or disability. In this study, several students were withheld from the study because their Individualized Education Plan required them to have spelling instruction with the Learning Disabilities teacher. Brandt and Gielbelhaus (2000) used Ganske's word sort format with developmentally handicapped children. Significant differences were found in test scores after implementing word sorting. If considering adopting the Developmental Word Sorting instruction methods, the researcher recommends including students with disabilities whenever possible.

It is conceivable that some students may not flourish with word sorting instruction at first. While some might say that these individuals are simply poor spellers, it is the opinion of the researcher that continued exposure to word sorting would eventually help to improve spelling. Students that have had up to five years of practice trying to memorize the spelling of words may struggle with the onset of the word sorting method. If students start their

schooling with word sorting instruction and are shown how to use words they already know how to spell to learn to spell new words, they may develop better spelling strategies along the way.

A major flaw in the design of this study was in the method of post-testing the students. In this study, students tested a partner using the word lists they selected at the beginning of the study. The researcher suggests a change to the individualized word sorting lists in the existing study. To ensure that students are in fact testing on the same twelve words for each of the three posttest situations, the researcher suggests testing the entire developmental group with a random selection of twelve words from the word sort. For example, 20 words would be introduced and sorted at the beginning of the Experiment week. Students would practice sorting and spelling all words during the week. The researcher would select twelve words at the end of the week and test all students from that developmental level on the same words. This would reduce or even remove the event of student errors in the testing process that occur when doing student partner testing.

This study did not allow for absent students to participate in the post-tests. In future studies, preparations may be made to allow absent students to make up the test on the day they return.

There are many areas of interest relating to word sorting and word study that require further research. One suggestion for a future study includes a survey asking parents and students to respond to a variety of questions about word sorting techniques. Some questions may help to determine the level of understanding of word sorting. Do parents and students feel as if they have a better understanding of spelling and the way words work? Has word sorting improved your (or your child's) spelling on written assignments?

A study of spelling application to new words could show whether word sorting helps students to understand the way the language works. Students could practice sorting a particular feature and then be tested on *different* words that have the same feature, but were not used in practice during the week. This would show how well students are able to apply feature knowledge to new words or unfamiliar words. Further research could also study the accurate application of sorted words into student writing.

Additional studies using word sorting could focus on specific sorting and spelling errors on the posttests. An analysis could be done on each student who made errors to determine if the errors were consistent or inconsistent throughout the three posttests. For example, a researcher could record the spelling errors of each student and determine if the errors were consistent or inconsistent from the first through the third posttests. Or perhaps correctly sorted words, but did not spell correctly, may imply that the student may have attempted to memorize the spelling instead of using the sorting “rule” to guide the spelling. Still others may spell words correctly, but sort incorrectly. This might imply that the student attempted to memorize the spelling and the sort without comparing the spelling to the other words in the category.

Conclusion

At this time, few trends have been identified in spelling instruction in the United States. Less than half of the school districts surveyed in Traynelis-Yorek and Strong’s study (1999) used a published spelling text. Traynelis-Yorek and Strong determined that there were no apparent trends for teaching spelling in the United States. Yet the decline of children’s spelling skills continues to be of great concern to parents and school districts. (Chandler and the Mapleton Teacher-Research Group, 2000).

A new trend needs to develop. This trend should be based on research that shows how children learn and how brains develop. This trend should allow for all types of learners at a wide range of abilities. Word sorting is a part of this trend. Helping children learn about words at their “just right” level corresponds with what teachers know about how children learn to read and how children develop. This study suggests that word sorting instruction at students’ developmental level increases spelling retention and results in consistently higher test scores when compared to traditional methods.

REFERENCES

Abbott, M. (2000). Identifying reliable generalizations for spelling words: The importance of multilevel analysis. The Elementary School Journal, 101 (2), 233-245.

Angelisi, M.A. (2000). Teaching spelling: Which strategies work best. (Report No. CS 217 076) Lehman College. (ERIC Document Reproduction Service No. ED 440 395).

Apel, K. (2001). Theory-guided spelling assessment and intervention: A case study. Language, Speech & Hearing Services in Schools, 32 (3) 182-95

Arra, C., Aaron, P.G. (2001). Effects of psycholinguistic instruction on spelling performance. Psychology in the Schools, 38 (4), 357-363.

Bear, D., Invernizzi, M., Johnston, F., & Templeton, S. (1996). Words their way: Word study for phonics, spelling and vocabulary instruction. Upper Saddle River, NJ: Prentice Hall, Inc.

Bear, D., Templeton, S. (1998). Explorations in developmental spelling: Foundations for learning and teaching phonics, spelling, and vocabulary. Reading Teacher, 52 (3), 222-243.

Brandt, T., Gielbelhaus, C. R. (2000). Word study and spelling achievement (Report No. TM 032 086). (ERIC Document Reproduction Service No. ED 447 197)

Brasacchio, T., Kuhn, B., Martin, S. (2001). How does encouragement of invented spelling influence invented spelling development? (Report No. CS 217 510). Avon, NY. (ERIC Document Reproduction Service No. ED 452 546)

Bruck, M., Treiman, R., Caravolas, M., Genesee, F., Cassar, M. (1998). Spelling skills of children in whole language and phonics classrooms. Applied Psycholinguistics, 19, 669-684.

Chandler, K. & The Mapleton Teacher-Research Group. (2000). Squaring up to spelling: A teacher-research group surveys parents. Language Arts, 77 (3), 224-231.

Darch, C., Kim, S., Johnson, S., James, H. (2000). The strategic spelling skills of students with learning disabilities: The results of two studies. Journal of Instructional Psychology. 27 (1), 15-27.

Elliott, J., Reitschel, K. (1999). The effects of word study on students' application of spelling and phonics in their independent writing. (Report No. CS 216 648) Chandler, IN. (ERIC Document Reproduction Service No. ED 429 301)

Fresch, M. (2000). What we learned from Josh: Sorting Out Word Sorting. Language Arts, 77 (3), 232-240.

Fresch, M., Wheaton, A. (1997). Sort, search, and discover: Spelling in the child-centered classroom. The Reading Teacher, 51 (1), 20-31.

Fresch, M., Wheaton, A., Zutell, J. (1998). Thinking aloud during spelling word sorts. The National Reading Conference Yearbook, 47, 285-294.

Ganske, K. (1999). The developmental spelling analysis: A measure of orthographic knowledge. Educational Assessment, 6 (1), 41-71.

Ganske, K. (2000). Word Journeys. New York, NY: The Guilford Press.

Henderson, E.H. & Beers, J. W. (1980). Developmental and cognitive aspects of learning to spell: A reflection of word knowledge. Newark, DE: International Reading Association.

Johnston, F. (1999). The timing and teaching of word families. Reading Teacher, 53 (1), 64-76.

Goldsmith, P. (1995). The development of spelling and word knowledge in older students (years 5-11). Australian Review of Applied Linguistics. 18 (1), 109-128.

Johnston, F. (2001). Exploring classroom teachers' spelling practices and beliefs. Reading Research and Instruction, 40 (2), 143-156.

Joseph, L. (2000). Developing first graders' phonemic awareness, word identification and spelling: A comparison of two contemporary phonic instructional approaches. Reading Research and Instruction, 39 (2), 160-169.

Joseph, L. (2002). Facilitating word recognition and spelling using word boxes and word sort phonic procedures. School Psychology Review, 31 (1), 122-130.

Mayer, Richard E. (2002). Rote versus meaningful learning. Theory Into Practice, 41 (4), 226-232.

Reece C., Treiman, R. (2001) Children's spelling of syllabic /r/ and letter-name vowels: Broadening the study of spelling development. Applied Psycholinguistics, 22, 139-165.

Rymer, R., Williams, C. (2000) "Wasn't that a spelling word?": Spelling instruction and young children's writing. Language Arts, 77 (3), 241-249.

Templeton, S., & Morris, D. (1999). Questions teachers ask about spelling. Reading Research Quarterly, 34 (1), 102-112.

Traynelis-Yurek, E., & Strong, M. W. (1999). Spelling practices in school districts and regions across the United States and state spelling standards. Reading Horizons, 39 (4), 279-294.

Varnhagen, C. K., Boechler, P. M., & Steffler, D. J. (1999). Phonological and orthographic influences on children's vowel spelling. Scientific Studies of Reading, 3 (4), 363-380.

Zutell, J. (1998). Word sorting: A developmental spelling approach to word study for delayed readers. Reading & Writing Quarterly, 14 (2) 219-239.

Zutell, J. (1996). The directed spelling thinking activity (DSTA): Providing an effective balance in word study instruction. The Reading Teacher, 50 (2), 98-96.