EFFECTS OF WHOLE WORD AND INDIVIDUAL LETTER SELF-CORRECTION ON THE ACQUISITION, MAINTENANCE, AND GENERALIZATION OF SPELLING WORDS WITH ELEMENTARY STUDENTS

A Thesis

Presented in Partial Fulfillment of the Requirements for the degree of Masters of Arts in the Graduate School of The Ohio State University

by

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* * * * *

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FIELD OF STUDY

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Chapter I

INTRODUCTION

This chapter begins by introducing the topic of spelling. The importance of spelling is discussed and a definition of spelling is provided. A review of the literature presents research on how children spell, the spelling deficits of problem spellers, the difficulties inherent in spelling the English language, and effective instructional strategies for the learner with disabilities. Studies involving self-correction techniques will be discussed as well. A statement of the purpose of this study and the research questions addressed follow the review of the literature.

Importance of Spelling

From being considered "...the foundation of reading and the greatest ornament of writing" (Noah Webster, 1783 [cited in Templeton, 1992, p. 454]) to "Benjamin Franklin's suggestion that an educated man should be able to spell any word at least
six ways" (Sipe, 1994), spelling has historically been subject to comment within and outside the educational domain.

Public perception of the importance of spelling has remained constant over the years. How well one spells demonstrates his/her level of literacy, his/her intelligence, and reflects on the competency of the educational system (Templeton, 1992). To the public, a piece of writing filled with misspellings looks unfinished, and the writer is perceived to be uninformed and a poor writer (Gill, 1992). As the primary purpose of writing is effective communication, misspellings, which cause the reader to pause, impede that process (Tietelbaum, 1991). According to Wallace, Cohen, and Polloway (1987), the frequency and type of spelling errors made by the writer influences the reader's acceptance of the message as well as his/her view of the writer. The writer may be perceived as careless (which indicates a lack of concern for one's audience), or uneducated (Mercer & Mercer, 1989). Schools and businesses have been known to turn down
prospective employees because of misspellings on letters and resumes (Sipe, 1994).

Definition of Spelling

Educators believe good spelling is necessary for clear written communication, and therefore an integral part of the language arts curriculum. Graham and Miller (1979) believe that though spelling is not as important as the ideas being conveyed, it is a crucial ingredient in the successful conveyence of those ideas.

Recent research has elevated the subject of spelling from the perception that it is a rote skill to be learned in isolation to the belief that it is a cognitive process, involving the interaction of many skills. Graham and Miller (1979) have defined spelling as the ability to recognize, recall, reproduce, or obtain orally or in written form the correct sequence of letters in words. A word knowledge-based definition is found in the research of Wong (1986). Spelling is defined as a cognitive act in which the child accesses several sources of
word knowledge that include knowledge of the individual sounds (phonemes) in words, knowledge of relations between phonemes in the word, knowledge of orthographic spelling patterns, and syntactic and semantic knowledge of the word. Once the word is spelled, the child then uses visual memory to decide if it is spelled correctly. Spelling is a complex process that draws on a variety of skills and knowledges (Graham, 1985).

**Statement of Problem**

Many school-age children experience difficulty when learning to spell. Of those students, a high occurrence of spelling problems is found among those students with learning disabilities (Graham & Miller, 1979). Both classroom and special education teachers note that while words may be "learned" for the weekly test, little maintenance over time or generalization in written work occurs for students with spelling difficulties, which leaves educators questioning the validity of traditional spelling methods. Researchers have
found spelling books to lack relevant and appropriate activities (Graves, 1977). In fact, they offer only a minimal amount of actual instructional practice (Cronnell & Humes, 1980). Introducing all 15-20 words in the beginning of the week and then expecting the students to "study" on their own with little guidance from the teacher characterizes many approaches used in the classroom (Gettinger, 1984). There is a need to investigate different and more effective methods that will help students be better spellers.

REVIEW OF THE LITERATURE

Research on How Students Spell

Spelling is basically accomplished through two major routes or modalities: visual (e.g., Does it look right?) and auditory (e.g., Does it sound right?). These routes are supplemented by one or more of the following cognitive skills: rules (e.g., "i" before "e" except after "c"), semantics (e.g., the writer uses the meaning of the target word to arrive at spelling), morphology (the writer adds suffixes/prefixes to
form target word), analogy (the writer uses words similar to target word in sound as models) and motor (the writer uses automatic movements in writing letters of target word) (McAlexander, Dobie, & Gregg, 1992). A child must have visual and auditory memory in order to write a word accurately because the stimuli for spelling are speech sounds that are less tangible or durable (Cronnell, 1971; Okyere, 1990). Kreiner and Gough (1990) tested the hypothesis that use of rules and word-specific memory were equally important components for accurate spelling. Their findings suggest this was indeed the case: Rules about phoneme-to-grapheme correspondence are used in spelling in addition to word-specific memory. When variables associated with word-specific memory were controlled, rule ambiguity still affected the difficulty of spelling. When variables for rule ambiguity were controlled, word frequency still affected the difficulty of spelling. The supporters of the developmental approach to spelling would say that one's ability to spell is directly
related to one's prediction and knowledge of the rules governing a writing system, which change and grow with the speller (Ganschow, 1981). Bailey's findings (1990) suggest that fluent spelling, even in the adult years, involves the identification and application of linguistic rules. This search for patterns may serve as an organizing principle, in terms of initial storage of the word, subsequent retrieval and a general problem-solving approach. To take this problem-solving approach to spelling one step further, "the job of the speller as a problem-solver, then, becomes one of purveying, allocating, evaluating, and generally orchestrating resources from both the data-driven (decoding) and the hypothesis-driven (recognitive) components of information processing" (Hall, 1984, p. 70).

Research on Characteristics of the Learning Disabled Speller

The demands of the spelling process, then, are to discriminate, recall, and reproduce an exact letter sequence. These skills are among those most often identified as areas of
difficulty for the child with learning disabilities (Wallace, Cohen, & Polloway, 1987). Coupling the complexity of the spelling process with language-related deficits experienced by many learners with learning disabilities results in a slower acquisition of spelling skills for these students (Wallace, Cohen, & Polloway, 1987). Hall explains the slower acquisition of spelling skill rates among students with learning disabilities within the context of developmental stages. He states that though students with learning disabilities appear delayed in comparison to their normal achieving peers, they do produce the same errors that are characterized as logical, systematic, and consistent with younger age groups, while showing little or no evidence of errors that are described as deviant, random, or pathological; they possess, but fail to access spontaneously or to use efficiently, considerable experimental and rule-governed information about spelling and, given sufficient pre-training skills, can be trained in self-monitoring routines that result
in improved spelling (Hall, 1984). That learning disabled students employ the same sequence of developmental strategies as their nondisabled peers, but at a delayed rate of progress, is also noted by Carpenter and Miller (1982) and Gerber and Hall (1985).

Another trait exhibited by many students with learning disabilities is their inability to monitor their own spelling. Educators working with students with learning disabilities "have reported that this group exhibits deficits in monitoring errors in spelling four times as often as their nondisabled peers" (Alley, Deschler, & Warner, 1979 [cited in Wallace, Cohen, & Polloway, 1987, p. 295]). Hall (1984) has noted self-monitoring training to be effective in improving the spelling performance of students with learning disabilities. This topic will be discussed in greater detail in a later section of this text.

A study by Radebaugh (1985) found that poor spellers relied more on sounding-out strategies than visual memory or
applied common English spelling patterns. This finding supports the findings of Bruce and Cox (1983), which showed poor spellers relied on rules of letter-sound relationships.

The written expression of disabled spellers across the curriculum reflects the constraints under which they operate. Disabled spellers cannot rely on automatic spelling vocabularies, nor do they have support resources typically available to normal spellers (Silva & Yarborough, 1990). Their writing is restricted to more easily spelled words. Because they experience difficulty in developing ideas due to a lack of spelling fluency, they believe themselves to be poor writers.

Research on the Difficulties of the English Language

Inconsistencies in the English language are also a source of frustration for students with learning disabilities. English is not a wholly phonetic language, therefore learning to spell is no easy matter. The English language, a potpourri of many languages (primarily German, French, and Latin), has more often than not, retained the original spellings of words even
after the pronunciations have changed (Teitelbaum, 1991). In addition to the foreign spellings, 26 letters of the alphabet represent 44 sounds, silent letters, variant and invariant sounds, and 300 different letter combinations for 17 vowel sounds (Allred, 1977).

Not surprisingly, the English language has the largest vocabulary in the world. Research has found that a relatively small number of words accounts for a large percentage of words children and adults use in writing. To illustrate: eight words account for 18% of all the words children use in their writing, 100 words for 50%, 1,000 words for 89%, 3,000 words for 97% and 4,000 words for 99% (Hillerich, 1981; E. Horn, 1960). Based on this finding, it has been suggested that a basic spelling vocabulary, drawn from words most frequently used by children, should form the core of spelling programs in the classroom (Carroll, Richman, & Davies, 1971; Fitzsimmons & Loomer, 1978; Graham & Harris, 1993; Greene, 1954; Horn, 1969; Rinsland, 1945).
Research on Effective Instructional Strategies

Many strategies have been found to be successful in helping the learning disabled student increase spelling fluency. Though some of the research was conducted decades ago, the resultant instructional procedures have been validated through the years by subsequent studies. A review of such strategies appears below.

1. Allow more time for written expression activities. Learning how to spell is reinforced when practiced in real writing situations (Taylor & Kidder, 1988). Writing allows the student to practice spelling by using words in meaningful contexts such as sentences, paragraphs, and stories (Fitzsimmons & Loomer, 1977; Hillerich, 1976; McPherson, 1984; McSweeney, 1959).

2. Pretest prior to instruction. For 51 years, the test-study-test method has been documented to be more effective than the traditional study-test method (Blanchard, 1944; C.Edwards, 1931; Fitzgerald, 1953; Fitzsimmons & Loomer,
1977; Gates, 1931; Hibler, 1957; Johnson, Langford, & Quorn, 1981; Kingsley, 1923; Montgomery, 1957; Yee, 1969). The test-study-test method uses a pretest to identify words that are unknown to the speller, which allows the speller to study only unknown words. The speller then studies the unknown words, which he/she will be tested on at the end of the prescribed time.

3. Allow students to correct their own errors. The process of self-correcting is considered by many researchers to be the single most important factor in learning to spell (Christine & Hollingsworth, 1966; Horn, 1967). Allred (1977) and Fitzsimmons and Loomer (1977) concur with the findings of their colleagues. Following the axiom that one learns by doing, students learn to spell by locating and correcting their own mistakes. Research on this topic will be addressed further in the following section.

4. Use a multisensory spelling strategy. Traditional spelling methods basically rely on one modality for practice,
but research supports a multi-sensory approach to spelling
(Allred, 1987; Fitzgerald, 1951; Graham & Miller, 1979; Horn,
1954; Hunt et al., 1963) in which the student would SEE the
word, SAY the word, SPELL then WRITE the word, CHECK for
accuracy, and finally REPEAT the process if necessary (3SWC-
R). A multi-sensory approach allows for increased opportunity
to respond (repeated practice), a factor necessary to the
learning process. Two formalized approaches based on a multi-
sensory approach are the Fernald and Gillingham-Stillman
methods which use oral, visual, tactile, and auditory
modalities, plus repeated practice through drill. The Horn
method is also considered multi-sensory and uses oral,
auditory, tactile, and visual modalities, as well as a
proofreading component. Through each modality, the student
practices spelling the word. The process is repeated if the
student makes a mistake.

5. Reduce unit size and distribute practice. The
processing abilities of the student with learning disabilities
can be easily overloaded by presenting a large number of words in one sitting (Gettinger, 1984). Horn (1969) believed that the number of words given to the student with learning disabilities should be reduced to a manageable size. Many researchers (Bryant et al., 1981; Gettinger, Bryant, & Fayne, 1982; and Reith et al., 1974), found that students were more successful at working with a smaller number of words every day. A reduced unit size of three words per day was suggested as the optimum size for problem spellers.

6. **Train for transfer.** Word study through direct instruction practices has been shown to help problem spellers "discover phonic generalizations that can be applied to a larger number of words ..." (Gettinger, 1984, p. 45). Gettinger et al. (1982) found that creating a structure to accommodate transfer of training was successful with problem spellers.

7. **Use error imitation plus modeling.** Kaufman, Hallahan, Haas, Brame, and Boren (1978) compared modeling the correct response with imitating the child's spelling with the correct
response written next to it. The imitation-plus-modeling was found to be superior to the modeling-only method. Nulman and Gerber (1984) replicated these findings.

8. Establish peer tutoring. The findings of Mandoli et al. (1982) suggest that peer tutoring has a positive impact on spelling accuracy for those students with learning disabilities who were mainstreamed into general education classes (Gordon & Schumm, 1993). In addition, Dineen, Clark, and Risley (1977), Harper, Mallette, and Moore (1991), and Scruggs and Richter (1985) found that peer tutoring was effective in increasing the spelling fluency of problem spellers.

9. Use computer-assisted instruction. Findings from research studies have been mixed with respect to students with learning disabilities and spelling instruction/practice via the computer. McDermott and Watkins (1983) and Fitzgerald, Fick, and Milich (1986) reported that computerized instruction was no more effective than conventional methods. In contrast, MacArthur, Haynes, Malouf, and Harris (1986)
found computer-assisted instruction (CAI) to be superior to conventional methods. They found the students were actively engaged with content more often, and that they spent less time off-task. Weekly achievement and retention scores were also greater during the CAI condition. Kinney, Stephens, and Schuster (1988), Margalit and Roth (1989), and Watkins (1989) found that students with learning disabilities developed more positive attitudes toward spelling activities on the computers. The use of computers for spelling instruction capitalizes on student interest, thus potentially enhancing spelling performance and increasing motivation.

10. Choose high-frequency words for spelling study. The words chosen for an effective spelling program should have high frequency in children's and adults' writing (Fitzsimmons & Loomer, 1970; Hillerich, 1974; Hollingsworth, 1965; E. Horn, 1960; Smith & Ingersoll, 1984).
Studies Involving Self-Correcting Techniques

Students with learning disabilities have often been characterized as inattentive, detached, passive, and distractable in the classroom. Since academic-engaged time is significantly correlated with achievement (Graden, Thurlow and Ysseldyke, 1983), it is vital to these students' success in the classroom that teachers employ procedures that will ensure their active engagement during instruction (Graham & Stoddard, 1986-1987). Self-correction is one such strategy that involves the attention and activity of the student. It is defined as a teaching procedure in which the student compares his/her responses to a correct model, and then writes a correct response next to his/her error. Many researchers have noted the efficacy of this strategy under the direction of a teacher during spelling instruction (Allred, 1977; Christine & Hollingsworth, 1966; T. Horn, 1946; Schoephoerster, 1962). Ganschow (1983) added the use of editing marks for omissions, wrong letter, and insertions to proofread for
correct letter sequence in misspellings. Results showed improved performance on weekly tests.

In a study designed by McNeish (1985), this self-correcting technique was tested with five seventh grade students (aged 13-14) who were diagnosed with learning disabilities. She used an alternating treatment design and compared it to the traditional spelling methods used in the classroom. Both conditions were conducted for 20 minutes per day for eight weeks.

During the traditional spelling condition, students were given daily spelling tasks. On Monday, students wrote their words as many times as possible. Students wrote their words in sentences on Tuesday. Wednesdays were devoted to alphabetizing and, on Thursday, the students wrote their words in a story format. On Friday, the students were tested using a word-sentence-word dictation method.

During the self-correction condition, students were taught four proofreading marks for omissions, wrong letter,
insertions, and transpositions. Monday through Thursday was allotted for practice using a self-correction form in which their words were written correctly in the first column. The other four columns (A-1, A-2, B-1, and B-2) were blank. Words were dictated to the students by high-achieving eighth graders. The students folded their word column under and attempted to spell their dictated words. They then unfolded the word column, which contained the correctly spelled stimulus words, and compared their spelling to the model. Then they corrected their words using the proofreading marks and wrote the word correctly in the next column. Then they refolded their paper and repeated the procedure as time allowed.

The results indicated that self-correction was an effective strategy in learning unknown words. All five students had higher weekly posttests scores under the self-correction condition than under the traditional spelling condition. These results confirmed Ganschow's statement that
students who corrected their own work learned to spell more words per week as indicated on weekly posttest scores. Four of the five students had higher delayed posttest scores under the self-correction condition as well, indicating that students maintained more words over time using this method. In reviewing student work in other subject areas, McNeish found that 59% of their words generalized under the self-correcting condition as opposed to 41% word generalization under the traditional spelling condition. Overall, McNeish found that self-correction was more effective in the acquisition, maintenance, and generalization of unknown words than traditional spelling methods.

Okyere (1991) replicated McNeish's study with six elementary students attending a university-sponsored tutoring clinic (three times per week). The students ranged in age from 7 to 13 years and demonstrated marked spelling problems. Okyere used the same self-correction procedures as McNeish, but did not compare self-correction to traditional spelling
methods. Parents administered both the pre-test and maintenance measure at home. During each visit to the clinic, the students completed a 30-minute self-correction activity in which students listened to a tape on a tape recorder (previously made by the experimenter) and filled out the self-correction form following the same procedures used in McNeish's study. Okyere's findings again supported the contention that those students who correct their own misspellings learn to spell those words correctly. Delayed posttest findings showed that 85% of the acquired words were maintained. To test for generalization, the students were asked to write variations of the target spelling words in sentences at home (e.g., affection/affectionate, receive/receiving). Four of the six students spelled 80% or more of the words correctly. Data for one of the students were not available, and one student spelled 73% of the words correctly. Okyere's study confirmed McNeish's study in that self-correction was effective in terms of acquisition,
maintenance, and generalization of unknown spelling words.

Wirtz (1992) replicated McNeish's study with six third graders with spelling difficulties. An alternating treatment design was used, comparing self-correction to traditional spelling methods. Twenty-minute sessions were constant under both conditions. Wirtz used the same traditional spelling procedures and self-correcting procedures as McNeish, with the exception of substituting tapes and tape recorder for word list dictation for dictation by peers.

Results indicated that students spelled more words correctly after self-correction than traditional spelling methods on weekly posttests. Five of the six students spelled more of their acquired words correctly on the delayed posttests during self-correction as opposed to traditional methods. Oral spelling was used as a measure of response generality, and again the majority of the students (five of six) spelled more words learned in the self-correction condition correctly than under the traditional condition.
Wirtz's findings substantiated McNeish's and Okyere's results that self-correction was effective in the acquisition, maintenance, and generalization of spelling words.

Finally, McGuffin (1995) replicated McNeish's study with six third-grade students who were considered at-risk academically and exhibited poor spelling ability. McGuffin compared self-correction and traditional spelling methods, using an alternating treatment design with one methodological variation. Sessions were a constant 20 minutes under both conditions.

During the traditional spelling condition, the students wrote each word correctly five times, Monday through Thursday. On Friday, students were administered the weekly spelling test.

During the self-correction condition, the students used a different form from previous self-correcting spelling studies. Students were given a sheet with their words written correctly in the first column and columns two through five
were blank. They first listened to their entire list of words and looked at the correctly spelled words as they heard them. They then folded the word list column under and rewound the tape to write their attempts as they listened to their words. Upon completion, they unfolded the paper and using the correctly spelled words as a model, checked their attempts, and wrote the word correctly above any misspelled word. They then folded the paper to the next blank column, rewound the tape, and began again. This procedure was followed Monday through Thursday, and the weekly test was administered on Friday.

The results of this study indicated that self-correction was superior to traditional spelling methods, as all six students spelled more words correctly under the self-correction condition on weekly posttests. Five of the six students maintained a higher number of acquired words on the delayed posttests under this condition as well, again confirming the findings of the previous self-correction
spelling studies.

**Purpose of the Study**

This purpose of this study was to compare the two different forms of self-correction that were employed in the research studies of McGuffin (1995), McNeish (1985), Okyere (1990), and Wirtz (1992). McNeish, Okyere and Wirtz used a form in which students looked at the individual letter sequence through the use of editing marks. McGuffin's study did not use the editing marks. Instead, the students wrote the corrected word--the complete orthography--above the misspelled word. The purpose of the present study was to discover if one method of self-correction was more effective than the other.

**Research Questions**

1. What is the effect of whole word self-correction on the acquisition (weekly spelling tests), maintenance (delayed spelling tests), and generalization (written expression in daily journal writings) of unknown spelling words?
2. What is the effect of individual letter self-correction on the acquisition (weekly spelling tests), maintenance (delayed spelling tests), and generalization (written expression in daily journal writings) of unknown spelling words?

3. Can it be determined which, if either, of the two forms was most effective?

4. Do students have a preference for either whole word or individual letter self-correction?

5. Will the use of self-correction improve students' overall spelling performance as measured by a pre- and post standardized test?
Chapter II

METHOD

The purpose of this chapter is to describe the method and the procedures used in this study. A description of the subjects, setting, experimenter, dependent and independent variables, materials, procedures, experimental design, and reliability measures are contained in this chapter.

Students

The students in the study were chosen from the elementary school children who attended the afternoon child care F.A.S.T. program at Edison Elementary School. Permission forms were sent to all the parents who had children in the afternoon school care program. Only those students whose parents signed and returned the permission form participated in the study (see Appendix A for an example of the permission form). The students ranged in age from seven through ten and in grade from 1 through 4. There were two female students
and six male students. Five of the eight students were in general education, two students were identified as learning disabled and one student was identified as at-risk for academic failure. The majority of the students were problem spellers. Spelling ability level for the eight students, as measured by the Test of Written Spelling-3, ranged from .8 to 4.2 grade level. Table 1 shows the categorization of students.

Setting

This study was conducted in a middle socioeconomic suburban school in central Ohio. The school contained grades kindergarten through 4 and served 241 students. The study was conducted in the Edison Elementary resource room on the first floor of the building. The room measured 11.28 meters by 7.16 meters, with one door opening onto the hallway. This room served 26 students with learning disabilities during school hours. Spelling sessions were held at the following places in the room: five subjects were situated at a long rectangular table parallel to the blackboard along the hallway
Table 1

<table>
<thead>
<tr>
<th>Student</th>
<th>Age/Grade</th>
<th>Gender</th>
<th>IQ</th>
<th>SS/GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7/1</td>
<td>F</td>
<td>*</td>
<td>88/.8</td>
</tr>
<tr>
<td>2</td>
<td>7/2</td>
<td>F</td>
<td>*</td>
<td>92/1.1</td>
</tr>
<tr>
<td>3</td>
<td>10/3</td>
<td>M</td>
<td>107</td>
<td>67/.9</td>
</tr>
<tr>
<td>4</td>
<td>9/3</td>
<td>M</td>
<td>114</td>
<td>84/1.9</td>
</tr>
<tr>
<td>5</td>
<td>9/3</td>
<td>M</td>
<td>*</td>
<td>82/1.8</td>
</tr>
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<td>6</td>
<td>9/3</td>
<td>M</td>
<td>112</td>
<td>75/1.5</td>
</tr>
<tr>
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<td>10/4</td>
<td>M</td>
<td>*</td>
<td>95/4.2</td>
</tr>
<tr>
<td>8</td>
<td>10/4</td>
<td>M</td>
<td>*</td>
<td>93/3.9</td>
</tr>
</tbody>
</table>

Note: The Standard Score (SS) and Grade Equivalent (GE) represent Test of Written Spelling 3 Total Word score across predictable and unpredictable words. IQ scores were not available for the students indicated by an asterisk. The Weschler Intelligence Test for Children III was the source of reported IQ scores.
wall, one at a study carrel perpendicular to the windows, one student at four student desks situated in a square shape, and one at a kidney-shaped desk across from the study carrel. Figure 1 depicts the setting arrangement.

**Experimenter**

The experimenter was a graduate student at The Ohio State University seeking a Master of Arts degree and certification in Special Education. She held a Bachelor of Arts degree in secondary education from Cleveland State University. She had a provisional teaching certificate in social studies for grades 7 through 12. Teaching experience included 3 years as a tutor for students with learning disabilities in the Grandview Heights City Schools, grades K through 12, and two years as a resource room teacher/tutor for students with learning disabilities, grades K through 4 in the same district. She also taught for two years in El Paso, Texas as a social studies teacher in a high school for girls.
Figure 1

Experimental Setting
Definition and Measurement of Dependent Variables

The dependent variables in the study were written spelling accuracy on weekly spelling tests, delayed posttests, and spelling accuracy contained in generalization activities. The Test of Written Spelling-3 (Larsen & Hammill, 1994) was administered as a pre- and posttest measure to determine overall spelling growth and achievement.

Weekly test scores. For the purpose of this study, spelling accuracy was defined as a correctly written sequence of letters for the stimulus word presented. For example, if the stimulus word was "from", the student had to write f-r-o-m. An error was defined as a misspelled word, a handwriting error, or the spelling of a homonym of the word presented. All stimulus words were verbally presented by the experimenter in a word-sentence-word format.

Weekly spelling tests were administered to the students on each Friday during the study. The experimenter scored all tests and placed a slash (/) in front of misspelled word. No
marks indicated correctly spelled words.

The number of correct responses on each weekly test was recorded. Test-item frequency remained constant at 15 words for third and fourth grade students. First and second grade students were tested on a constant ten words per week. The number of words spelled correctly out of the total words presented was calculated and graphed.

**Delayed posttest score-maintenance.** Previously given spelling tests were dictated to each subject two to three weeks (10-15 school days) following the administration of the weekly spelling test. Dictation of words occurred in the same manner as the weekly spelling test words i.e., word-sentence-word. Students wrote their responses on paper. The delayed spelling tests were marked in the same manner as the weekly spelling tests (a slash in front of the misspelled word). The number of words spelled correctly out of the total words presented was calculated and graphed.
Generalization measures. Samples of the students' written work were collected from their respective classroom teachers. Each student's writing journal was examined by the experimenter for generalized list words, as the entries were not edited for correct spelling by the students' classroom teachers. The experimenter began surveying journal entries dated from the first week of February and ended with those dated April 13th. Words from students' spelling lists spelled correctly were marked with a "+", and incorrectly spelled words were marked with a "-" on a cumulative list of words for students. A running record was maintained for each student's correctly and incorrectly spelled list words found in their journals. For example, if the stimulus word was "when" and the student wrote, "We watched the news when we finished our dinner," the experimenter placed a "+" next to the word "when" on the list. If the student spelled "when" in the above sentence "win", the experimenter placed a "-" next to the word on the list.
Independent Variable

The independent variables in this study were two different forms of self-correction: whole word self-correction and individual letter self-correction. The two forms of self-correction were compared to determine which, if either, better improved spelling performance. In whole word self-correction, students learned how to check their spelling words by comparing them to the standard form and marking a check above their word in the same column when their word was correct, or writing the correct word above the incorrectly written responses in the same column. In individual letter self-correction, students learned how to use four editing marks to check their written responses letter-by-letter. If their response was correct, a check was placed in the column next to the correctly spelled word. If their response was incorrect, the student wrote the word correctly in the column next to the misspelled word. Both self-correction methods allowed the students to practice correct orthography several
times during each session.

**Materials**

The *High Utility 500, Spelling Words and Skills*, and *Spell It-Write*, were used to formulate the lists for the pretests. The *Test of Written Spelling-3* (Larsen & Hammill, 1994) was used as a measure of spelling achievement. Manilla folders were used to hold lists of words spelled correctly for each student on weekly spelling tests. Lists were also kept of correctly spelled words from the delayed posttests. Paper and pencils were provided for the pretests, weekly spelling tests, and delayed posttests. A turquoise pen was used to correct all tests stated in the preceding sentence. Both whole word and individual letter self-correction sheets were photocopied and used in the self-correction activities (see Appendix B). Five tape recorders and tapes, an extension chord, and an electrical outlet bar for three of the tape recorders was used.

During training sessions, an overhead projector, plain transparencies, and transparencies made by the experimenter
were used. Also, flashcards (individually marked with the four proofreading marks to be used with the individual letter self-correction form) were used.

Test of Written Spelling-3. The Test of Written Spelling-3 or TWS-3 (Larsen & Hammill, 1994) was used as a pre- and posttest measure of spelling achievement. The experimenter administered this test as a pretest three days before data collection began. The test was administered again four school days after the final delayed posttest was given. Both tests were given in the LD resource room by the experimenter. This test was chosen because it could be administered in group settings, allowing the subjects in the study to take the test simultaneously. Spelling grade equivalents were calculated for each student's performance with regard to three types of words: words readily predictable in a sound-spelling pattern (predictable words), words less predictable in a sound-spelling pattern (unpredictable words), and an overall combination of both types of words (total words).
Social validity. Questionnaires were given to students and their teachers after the tenth week of the study (see Appendix E and F for a sample questionnaire). Students responded to questions regarding which method they preferred and which method they felt helped them learn their spelling words better. The students' teachers responded to questions such as, (1) Did you notice that N. spelled more words correctly in his/her written expression during the past seven weeks?; (2) Have you noticed any change in N.'s spelling performance during the last seven weeks?; and (3) Did you notice any change in attitude toward school work in general on the part of N. during the past seven weeks?

Procedures

This section describes the procedures that were followed during the implementation of this study.

Pretest for spelling achievement. The Test of Written Spelling-3 (Larsen & Hammill, 1994) was administered to the students by the experimenter four days prior to the beginning
of the intervention in the experimental setting.
Administration specified by the TWS-3 was followed when the test was given to study participants.

**Training procedure for students.** Training took place in the experimental setting prior to intervention sessions. Training lasted one week. Two days were spent training the whole word procedure, two days for individual letter condition and one day for practice using the tape recorder.

The training procedure followed a direct-instruction model and included modeling, guided practice, and independent practice. The following steps were used to teach the two types of self-correction individually: a) explanation of each form of self-correction; b) illustration and modeling of various steps associated with the two procedures; c) students and experimenter repeat the steps together; and, d) the students practice independently (see Appendix D for training script). Training for both whole word and individual self-correction protocols is described in detail below.
**Whole Word**

**Explanation of whole word self-correction.** The experimenter introduced the whole word self-correction method and the corresponding activity sheets through an interactive dialogue with the students. Transparencies were made previously by the experimenter depicting positive and negative examples of whole word self-correction. The positive examples showed a form with five horizontal columns, each with 10 to 15 spaces. The first column was blank and the other four columns had a hyphenated line drawn through the center of each space. The negative examples showed examples of the form that had either the hyphenated line drawn through all five columns, showed no hyphenated lines at all, or was placed in a vertical position (see Appendix B). The transparencies were placed on the overhead at the appropriate times throughout the dialogue. For example, when the experimenter was asking questions about what the whole word form looked like, a sample of the form was placed on the
overhead.

**Illustration and modeling of various steps.** The experimenter modelled how the students were to use the whole word self-correction method using transparencies of the whole word activity sheets. As she listened to 10 words on a tape, she wrote the words in the appropriate column, making sure to write some of the words incorrectly. She verbalized the steps involved as she corrected the spelling words she had heard.

**Students and experimenter repeat steps together.** The students repeated each step in the self-correction process after the experimenter. That is, the students listened to the words on tape (as did the experimenter), and then wrote the words in the appropriate column as shown by the experimenter, with the first column folded back to conceal the correctly spelled list words. Next, unfolding the first column, they compared their words with the correctly spelled list column and then self corrected. The experimenter travelled among the
students to individually check their work after each step was practiced.

**Student practice.** Using a sample of words, the students independently practiced the entire whole word self-correction procedure. After the self-correction activity, the experimenter checked the students' work, making sure each activity sheet was filled out correctly. Practice continued until all students reached 90% accuracy.

**Individual Letter**

**Explanation of individual letter self-correction.**

The experimenter introduced the individual letter self-correction form and the corresponding activity sheet to the students through an interactive dialogue (see Appendix C). Transparencies made by the experimenter were placed on the overhead projector at the appropriate times to show what this type of self-correction looked like and didn't look like. For example, a transparency was placed on the overhead showing five vertical columns, each with 15 blank spaces, when the
experimenter was talking about the individual letter self-correction form. Students were also asked to compare the two forms of self-correction and to discuss what was the same/different about the two forms. The individual self-correction form required the presentation and explanation of the four proofreading marks that were to be used. Using flashcards, the experimenter drilled the students on each proofreading mark.

Illustration and modelling of various steps. Using a blank transparency of the activity sheet for individual letter self-correction, the experimenter modelled the steps involved in completing this form. She covered the word list column, turned on the recorder, listened to/wrote each word on the tape and was careful to misspell some of the words. She uncovered the list words in the first column and showed the students how to use the editing marks for each word and wrote the word correctly in the adjacent column. For the words she spelled correctly, she placed a check mark in the adjacent
column. As with the whole word method, the experimenter verbalized each step as she performed it.

**Students and experimenter repeat steps together.**
The experimenter handed out individual letter activity sheets to the students with the words prewritten in the word list column and folded back concealed from view. The students and experimenter listened to the words on tape together and wrote them in the appropriate column. Then they uncovered the correctly spelled list words and corrected their spelling with the editing marks. The experimenter used the overhead projector so that all the students could see how to do the correcting. The experimenter travelled among the students and checked their work at each step.

**Student practice.** Using a sample of words, the students practiced the steps of the individual letter self-correction method. The experimenter travelled among the students to help with any questions or misunderstandings and to ensure the activity form was completed correctly. The
students practiced until each reached 90% accuracy with the individual letter self-correction method.

**Weekly Pretesting**

The students were given a weekly pretest by the experimenter on Monday afternoons. The purpose of the pretest was to identify 15 unlearned words that would comprise the third and fourth grade students' weekly spelling list and 10 unlearned words that would comprise the first and second grade students' weekly spelling list.

The words for the weekly pretest were first taken from the *High-Utility 500*, a list originally compiled from the *American Heritage Word Frequency Study* (Carroll, Davies, & Richman, 1971), and subsequently cross-checked with other studies (Gates, 1937; Horn, 1926; Rinsland, 1945; Greene & Loomer, 1977; Harris & Jacobson, 1972). The experimenter gave students 30-40 words per session in order to find 15 words all the students did not know how to spell. A second word source used for the third graders was the fourth grade

Words for the pretest were read aloud by the experimenter, then used in a sentence, then read aloud again (i.e., "Through"). You can go through a doorway only if it's opened. "Through"). Students wrote responses on 20.32 cm x 29.21 cm lined paper. They were told to attempt to spell all words that were dictated. The examiner closely monitored students' spellings and stopped the pre-test when 15 words were misspelled.

Data were not collected on pretest performance. The purpose of the pretest was solely to identify words for a student's weekly list.

**Daily Self-Correction Procedure**

The study was conducted Monday through Friday. On Monday, the students were pretested for unknown words. The
experimenter then collected the pretests and dismissed the students from the experimental setting. The experimenter corrected the pretests to compile their spelling lists and then made the tapes for the students to listen to during the practice sessions and during the Friday tests.

Tuesday through Thursday were allotted for either the whole word or individual letter self-correction methods of spelling practice. A coin was flipped to determine which self-correction method would be used that week. Heads dictated the whole word method and tails dictated the individual letter method. A timer was used to insure sessions for both methods lasted 15 minutes. The following procedures were followed for the days when the whole word condition was in effect:

1. The students were given the whole word activity form containing their words for the week.

2. The sheet contained five columns. The first column contained prewritten spelling words. Columns 2-4 were blank with a dotted line drawn through each
space for the spelling word/correction (see Appendix
B for a sample).

3. The first column was folded back so the prewritten
spelling words were concealed from the students'
view.

4. The students listened to their words on the tape
recorder and wrote the dictated words in Column 1.

5. Upon completion of the entire list, the students
unfolded the column containing the correctly spelled
words and self-corrected their attempts, writing the
proper spelling of the words above the misspelled
words and marking the correctly spelled words with a
checkmark.

6. The experimenter checked for proper correction and
folded Column 1 back in order for the students to try
again in Column 2.

7. The students listened to their words again and wrote
their responses in Column 2. Afterward, they self-
corrected, following the procedure described above.

The following procedures were followed on the days the individual letter condition was in effect:

1. The students were given a list of words for the week.

2. The sheet on which the words were written contained five columns. The Word List Column contained the correctly written words. Columns A-1 ("Your Turn to Write"), A-2 ("Your Turn to Self-Correct"), and B-1 ("Your Turn to Write"), B-2 ("Your Turn to Self-Correct") were blank.

3. The Word List Column was folded back so the students could not see the words in that column.

4. The students listened to their words on the tape recorder and wrote the dictated words in Column A-1.

5. Upon completion, the students unfolded the Word List Column and self-corrected each word using the following proofreading marks:

   ^ = Insert a letter. The letter to be inserted is written
above mark.

0 = Omit a letter. The circled letter must be left out.

/ = Wrong letter. Mark correct letter above it.

~ = Transpose the two letters.

6. The students used the Word List Column to self-correct each letter of the word and to write the word correctly in Column A-2.

7. The experimenter checked for proper correction and folded both the Word List Column and Column A-1 back so the students could try again, starting with Column B-1.

8. The students listened to their words and wrote them in Column B-1. Again, they self-corrected, using the four proofreading marks.

On Friday the students were tested on the words they learned under either the whole word or individual letter self-correction methods. Delayed posttests were also given on Fridays. The Friday tests and the delayed posttests were given
in the same manner as the pretests (i.e., a word-sentence-word format).

Posttest for spelling achievement. The Test of Written Spelling-3 (Larsen & Hammill, 1994) was given to each student four school days after the final delayed posttest was completed.

Experimental Design

An alternating treatment design was used in this study because the study compared two independent variables. The randomness of conditions was determined by flipping a coin: heads represented whole word method (A) and tails represented the individual letter method (B), thus minimizing sequence effects (Cooper, Heron, Heward, 1987). The order of treatment, selected in this manner, was A-B-B-B-A-A. Experimental control was demonstrated if differing data paths developed for each condition, did not overlap, and showed either stable levels or opposing trends (Cooper, et al., 1987).
Procedures to Ensure Accuracy and/or Reliability of Data

Dependent variables. Reliability checks were conducted each week by a coworker of the experimenter who scored randomly selected permanent products. She was trained to score the work one week prior to data collection. The percentage of agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements times 100.

Procedural integrity. Each week the experimenter's coworker checked to ensure that the procedure intended for this study was being implemented according to set standards. The coworker had a checklist of procedures that she marked as completed/noncompleted as she observed the experimenter.

The checklist contained items such as: (a) the students received their words at the beginning of the session; (b) the sessions lasted no longer than 15 minutes; (c) the experimenter checked each column and folded the paper appropriately (see Appendix G). The percentage of agreement
was calculated by dividing the number of agreements by the number of agreements plus disagreements times 100.

**Summary**

In this chapter, the specific methods and procedures used in this study were described. Descriptions of the subjects, setting, and experimenter were also given. This chapter also provided information about reliability measures for the dependent variables as well as procedural integrity measures.
Chapter III

RESULTS

This chapter presents the results of the study. The chapter begins by reporting the accuracy and reliability measures. This is followed by the results of each student's performance on weekly tests, delayed posttests and practice trials. The results of the generalization measure are presented, followed by the results of the social validity measure for students and teachers.

Interobserver Agreement.

Dependent variable. Interobserver agreement checks were conducted by the experimenter and an independent observer trained to score the permanent products every week. The independent observer used a different color pen and checked previously graded products. Agreement was 100% across students and conditions in this study for both the weekly tests and the two-week posttests. See Tables 2 and 3.
Table 2

Interobserver Agreement Scores on Weekly Spelling Tests

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<th>Treatment</th>
<th>Condition</th>
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<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
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Table 3

Interobserver Agreement Scores on Two Week Posttests

Across Students and Conditions

<table>
<thead>
<tr>
<th>Treatment Condition</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
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</table>
Independent variable. The observer was present during one of the three practice sessions each week of the study. She watched the experimenter, marking observations on a form given to her at the beginning of the session. Using the formula described in Chapter 2, a reliability score of 90% was obtained for the independent variable. The range was 66% to 100%. This means the experimenter followed all six procedures outlined on the interobserver reliability measure five out of the seven times she was observed. The procedures were constant under both the individual letter and the whole word self-correction conditions. See Table 4 for results.

Weekly Posttest Scores

On Friday of each week students were tested on the words they had practiced during that week. The whole word self-correction condition was in effect for weeks one, two, six, and seven, and the individual letter self-correction condition was in effect for weeks three, four, and five. The results for each student are summarized in Table 5.
Table 4

Interobserver Agreement Scores on Independent Variable

Across Students and Conditions

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<thead>
<tr>
<th>Treatment Condition</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>100%</td>
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Table 5

Number of Words Spelled Correctly on Weekly Tests per Condition for Each Student

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<th>Treatment</th>
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<th>S2</th>
<th>S3</th>
<th>S4</th>
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<td>-</td>
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<td>4</td>
<td>11</td>
<td>12</td>
<td>-</td>
<td>7.6</td>
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</table>

Note: Students 1 and 2 received 10 words per week. Students 3 through 8 received 15 words per week.
Student 1

Student 1 participated in three of the four tests administered during the whole word self-correction condition. Of the possible 30 words, 18 were spelled correctly, which represents an overall mean of 6 words learned per week with a range of 5 to 7 correct responses.

Of the three individual letter self-correction tests, scores for two tests were recorded. Of the possible 20 words, eight words were spelled correctly, which represents an overall mean of 4 words learned per week with a range of 3 to 5 correct responses (see Figure 2).

Student 2

Of the four tests administered during the whole word self-correction condition, three test scores were recorded for this student. Student 2 spelled 21 of 30 words correctly, which represents an overall mean of 7 words learned per week with a range of 4 to 9 correct responses.
Figure 2. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 1.
During the three weeks of the individual letter self-correction condition, 12 of 30 words were spelled correctly, which represents an overall mean of 4 words learned per week with a range of 3 to 5 correct responses (see Figure 3).

**Student 3**

Of the four tests administered during the whole word self-correction condition, three test scores were recorded for this student. Student 3 spelled 34 of 45 words correctly, which represents an overall mean of 11.3 words learned per week with a range of 11 to 12 correct responses.

Two test scores were recorded for the individual letter self-correction condition. Student 3 spelled 22 of 30 words correctly, which represents an overall mean of 11 words learned per week with a range of 11 to 11 correct responses (see Figure 4).

**Student 4**

Of the four tests administered during the whole word self-correction condition, two test scores were recorded for
Figure 3. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 2.
Figure 4. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 3.
this student. Student 4 spelled 27 out of 30 words correctly, which represents an overall mean of 13.5 words learned per week with a range of 13 to 14 correct responses.

During the three weeks of the individual letter self-correction condition, Student 4 spelled 36 of 45 words correctly, which represents an overall mean of 12 words learned per week with a range of 11 to 14 correct responses (see Figure 5).

**Student 5**

Test scores were recorded for all four tests of the whole word self-correction condition for this student. Student 5 spelled 36 of 60 words correctly, which represents an overall mean of 9 words learned per week with a range of 7 to 11 correct responses.

One test score (7 out of 15 words spelled correctly) was recorded for this student during the individual letter self-correction condition. Range and mean were not calculated for this student under this condition due to the single test score
Figure 5. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 4.
Figure 6. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 5.
(see Figure 6).

**Student 6**

Test scores were recorded for each week of the whole word self-correction condition for this student. Student 6 spelled 27 of 60 words correctly, which represents an overall mean of 6.7 words learned per week with a range of 5 to 9 correct responses.

During the three weeks of the individual letter self-correction condition, Student 6 spelled 23 of 45 words correctly, which represents an overall mean of 7.6 words learned per week with a range of 4 to 12 correct responses (see Figure 7).

**Student 7**

Of the four tests administered under the whole word self-correction condition, three test scores were recorded for this student. Student 7 spelled 32 of 45 words correctly, which represents an overall mean of 10.6 words learned per week with a range of 6 to 14 correct responses.
Figure 7. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 6.
Two test scores were recorded for this student under the individual letter self-correction condition. Student 7 spelled 16 of 30 words correctly, which represents an overall mean of 8 words learned per week with a range of 7 to 9 correct responses (see Figure 8).

**Student 8**

Test scores were recorded for all four tests administered during the whole word self-correction condition for this student. Student 8 spelled 44 of 60 words correctly, which represents an overall mean of 11 words learned per week and a range of 5 to 15 correct responses.

During the three weeks of the individual letter self-correction condition, Student 8 spelled 39 of 45 words correctly, which represents an overall mean of 13 words learned per week with a range of 11 to 14 correct responses (see Figure 9).
Figure 8. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 7.
Figure 9. Number of words spelled correctly across Individual Letter and Whole Word conditions for Student 8.
Summary

Examination of the overall number of words spelled correctly on weekly tests reveals that five of the eight students (Students 1, 2, 4, 5, and 7) spelled more words correctly with the whole word self-correction approach. Students 6 and 8 spelled more words correctly under the individual letter self-correction approach. Student 3 spelled the same number of words correctly under both approaches.

Delayed Posttest Scores

Delayed posttests were used as a measure of spelling performance over time. Students were administered delayed posttests ten school days after the weekly posttest. The tests were administered in the same format and content (and similar difficulty) as the original tests. Table 6 shows the results of delayed posttests for all students.

Student 1

Of the four delayed posttests administered under the whole word self-correction condition, one test score was
Table 6

Number of Words Spelled Correctly on Two-Week Posttests Following Each Condition for Each Student

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Condition</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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<td>-</td>
<td>-</td>
<td>9</td>
<td>8</td>
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<td>12</td>
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<td>List 2</td>
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<td>5</td>
<td>-</td>
<td>-</td>
<td>2</td>
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<td>13</td>
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<td>4</td>
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<td>7.3</td>
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</table>

Note: Students 1 and 2 received 10 words per week. Students 3 through 8 received 15 words per week.
recorded for this student. Out of 10 words, Student 1 spelled a total of 3 words correctly. Range and mean were not calculated for this student due to the single test score.

Two delayed posttest scores were recorded for this student under the individual letter self-correction condition. Student 1 spelled a total of 7 of 20 words correctly, which represents an overall mean of 3.5 words maintained with a range 2 to 5 correct responses per test (see Figure 10).

Student 2

Delayed posttest scores were recorded for all four tests administered under the whole word self-correction condition for this student. Student 2 spelled 19 of 40 words correctly, which represents an overall mean of 4.7 words maintained with a range of 3 to 7 correct responses per test.

Two delayed posttest scores were recorded under the individual letter self-correction condition. Student 2 spelled 8 of 20 words correctly, which represents an overall mean of 4 words maintained with a range of 2 to 6 correct responses per
Figure 10. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 1.
test (see Figure 11).

**Student 3**

Delayed posttest scores were recorded for three of the four tests administered under the whole word self-correction condition. Student 3 spelled 16 of 45 words correctly, which represents an overall mean of 5.3 words maintained with a range of 2 to 9 correct responses per test.

One delayed posttest score was recorded under the individual letter self-correction condition. Student 3 spelled 8 of 15 words correctly. Range and mean were not calculated for this subject due to the single test score (see Figure 12).

**Student 4**

Delayed posttest scores were recorded for two of the four tests administered under the whole word self-correction condition for this subject. Student 2 spelled 17 of 30 words correctly, which represents an overall mean of 8.5 words maintained with a range of 4 to 13 correct responses per test.
Figure 11. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 2.
Figure 12. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 3.
Under the individual letter self-correction condition, all three delayed posttest scores were recorded. Student 4 spelled 23 of 45 words correctly, which represents an overall mean of 7.6 words maintained with a range of 5 to 9 correct responses per test (see Figure 13).

**Student 5**

Delayed posttest scores were recorded for three of the four tests administered under the whole word self-correction condition for this student. Student 5 spelled 15 of the 45 words correctly, which represents an overall mean of 5 words maintained with a range of 2 to 9 correct responses per test.

One delayed posttest score was recorded under the individual letter self-correction condition. Student 5 spelled 5 of 15 words correctly. Mean and range were not calculated due to the single test score (see Figure 14).

**Student 6**

Delayed posttest scores were recorded for all four tests administered under the whole word self-correction condition
Figure 13. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 4.
Figure 14. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 5.
for this student. Student 6 spelled 16 of 60 words correctly, which represents an overall mean of 4 words maintained with a range of 1 to 8 correct responses per test.

Under the individual letter self-correction condition, all three delayed posttest scores were recorded. Student 6 spelled 16 of 45 words correctly, which represents an overall mean of 5.3 words maintained with a range of 2 to 8 correct responses per test (see Figure 15).

Student 7

Delayed posttest scores were recorded for three of the four tests administered under the whole word self-correction condition for this student. Student 7 spelled 30 of 45 words correctly, which represents an overall mean of 10 words maintained with a range of 7 to 12 correct responses per test.

Under the individual letter self-correction condition two of the three delayed posttest scores were recorded for this student. Student 7 spelled 14 of 30 words correctly, which represents an overall mean of 7 words maintained with a range
Figure 15. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 6.
of 6 to 8 correct responses per test (see Figure 16).

Student 8

Delayed posttest scores were recorded for all four tests administered under the whole word self-correction condition for this student. Student 8 spelled 42 of 60 words correctly, which represents an overall mean of 10.2 words maintained with a range of 7 to 13 correct responses per test.

Under the individual letter self-correction condition, delayed posttest scores were recorded for all three tests administered. Student 8 spelled 22 of 30 words correctly, which represents an overall mean of 7.3 words maintained with a range of 3 to 8 correct responses per test (see Figure 17).

In summary, the number of words maintained on the two week posttests under whole word self-correction was higher for four of the eight students (Students 2, 4, 7, and 8). Student 6 maintained more words under the individual letter self-correction method. Comparisons could not be made for
Figure 16. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 7.
Figure 17. Number of words spelled correctly on weekly and maintenance tests for specific spelling lists across Individual Letter and Whole Word conditions for Student 8.
Students 1, 3, and 5 due to insufficient data.

**Number of Practice Trials**

Practice trials were defined as the number of times students successfully completed the steps involved in each form of self-correction. Individual results are summarized in Table 7.

**Student 1**

Practice trials were recorded for three of the four weeks during the whole word self-correction method for this student. Student 1 completed a total of 162 practice trials successfully, yielding a mean of 54 trials per week, range 48 to 64 correct trials.

Practice trials were recorded for all three weeks using the individual letter self-correction form for this student. Student 1 completed 87 trials successfully, yielding 29 trials per week, range 20 to 40 correct trials (see Figure 18).
Table 7
Number of Trials Completed During Practice for Each Condition and Student

<table>
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<tr>
<th>Treatment Condition</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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<td>68</td>
<td>57</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>29</td>
<td>36</td>
<td>75.3</td>
<td>49.6</td>
<td>-</td>
<td>61.6</td>
<td>69.3</td>
<td>56</td>
</tr>
</tbody>
</table>

Note: Students 1 and 2 received 10 words per week. Students 3 through 8 received 15 words per week.
Figure 18. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 1.
Student 2

Practice trials were recorded all four weeks of the whole word self-correction method for this student. Student 2 completed a total of 259 practice trials successfully, yielding a mean of 64.7 trials per week, range 50 to 80 correct trials.

Practices were recorded all three weeks of the individual letter self-correction method for this student. Student 2 completed 108 practice trials successfully, yielding a mean of 36 trials per week, range 20 to 48 correct trials (see Figure 19).

Student 3

Practice trials were recorded for three of the four weeks during the whole word self-correction method for this student. Student 3 completed a total of 226 practice trials successfully, yielding a mean of 75.3 trials per week, range 83 to 60 correct trials.

Practice trials were recorded all three weeks of the individual letter self-correction method for this student.
Figure 19. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 2.
Student 3 completed 226 trials successfully, yielding a mean of 75.3 trials per week, range 59 to 85 correct trials (see Figure 20).

Student 4

Practice trials were recorded for two of four weeks of the whole word self-correction method for this student. Student 4 completed a total of 159 trials successfully, yielding a mean of 79.5 trials per week, range 69 to 90 correct trials.

Practice trials were recorded all three weeks of the individual letter self-correction method for this student. Student 4 completed 149 practice trials successfully, yielding a mean of 49.6 trials per week, range of 27 to 75 correct trials (see Figure 21).

Student 5

Practice trials were recorded all four weeks of the whole word self-correction method for this student. Student 5 completed a total of 322 practice trials successfully, yielding
Figure 20. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 3.
Figure 21.  Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 4.
a mean of 80.5 trials per week, range 60 to 119 correct trials.

Practice trials were recorded for one of the three weeks during the individual letter self-correction method for this student. Student 5 completed 60 practice trials successfully. Range and mean were not calculated (see Figure 22).

Student 6

Practice trials were recorded all four weeks of the whole word self-correction method for this student. Student 6 completed a total of 267 practice trials successfully, yielding a mean of 66.7 trials per week, range 45 to 90 correct trials.

Practice trials were recorded all three weeks of the individual letter self-correction method for this student. Student 6 completed a total of 185 practice trials successfully, yielding a mean of 61.6 trials per week, range 43 to 88 correct trials (see Figure 23).

Student 7

Practice trials were recorded all four weeks of the whole word self-correction method for this student. Student 7
Figure 22. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 5.
Figure 23. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 6.
completed a total of 202 practice trials successfully, yielding a mean of 50.5 trials per week, range 15 to 82 correct trials.

Practice trials were recorded all three weeks of the individual letter self-correction method for this student. Student 7 completed a total of 208 practice trials successfully, yielding a mean of 69.3 trials per week, range 60 to 80 correct trials (see Figure 24).

**Student 8**

Practice trials were recorded all four weeks of the whole word self-correction method for this student. Student 8 completed a total of 298 practice trials successfully, yielding a mean of 74.5 trials per week, range 45 to 106 correct trials.

Practice trials were recorded all three weeks of the individual letter self-correction method for this student. Student 8 completed 168 practice trials successfully, yielding a mean of 56 trials per week, range of 51 to 60 correct trials (see Figure 25).
Figure 24. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 7.
Figure 25. Number of trials during practice sessions across Individual Letter and Whole Word conditions for Student 8.
In summary, five of the eight students (Students 1, 2, 4, 6, and 8) completed more practice trials using the whole word self-correction method than the individual letter self-correction. Student 3 completed the same number of trials under both conditions. Student 7 completed more trials under the individual letter self-correction method than the whole word self-correction method. Student 5 had insufficient data to make a comparison.

**Generalization Measures**

Students' daily journals were collected at the end of the study and read by the experimenter to determine if students accurately spelled learned words in settings other than the experimental setting. Individual results are summarized in Table 8.

**Student 1**

During whole word self-correction method, Student 1 learned 18/30 words. In the classroom setting, none of these words were found in journal entries.
Table 8

Number of Words Spelled Correctly/Incorrectly in Generalized Writing Assignments for Each Student Across Conditions

<table>
<thead>
<tr>
<th>Treatment Condition</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
<th>S8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Word</td>
<td>-</td>
<td>4 / 0</td>
<td>0 / 1</td>
<td>-</td>
<td>-</td>
<td>1 / 0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Individual Letter</td>
<td>2 / 1</td>
<td>1 / 0</td>
<td>3 / 0</td>
<td>-</td>
<td>-</td>
<td>2 / 0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
While using the individual letter self-correction method, Student 1 learned 8/20 words. In the classroom setting, this student spelled two words correctly and one word incorrectly in journal entries.

**Student 2**

During the whole word self-correction method, Student 2 learned 21/30 words. In the classroom setting, four words were spelled correctly and no words were spelled incorrectly in journal entries.

During the individual letter self-correction method, Student 2 learned 12/30 words. In the classroom setting, one word was spelled correctly in journal entries and no words were spelled incorrectly in journal entries.

**Student 3**

During the whole word self-correction method, Student 3 learned 34/45 words. In the classroom setting, no words were spelled correctly and one word was spelled incorrectly in journal entries.
During the individual letter self-correction method, Student 3 learned 22/30 words. In the classroom setting, three words were spelled correctly and no words were spelled incorrectly in journal entries.

Student 4

The journal entries of Student 4 did not contain generalized words from the lists of words learned during either whole word or individual letter self-correction sessions.

Student 5

The journal entries of Student 5 did not contain generalized words from the lists of words learned during either whole word or individual letter self-correction sessions.

Student 6

During the whole word self-correction method, Student 6 learned 27/60 words. In the classroom setting, one word was spelled correctly and no words were spelled incorrectly in
journal entries.

During the individual letter self-correction method, Student 6 learned 23/45 words. In the classroom setting, two words were spelled correctly and no words were spelled incorrectly in journal entries.

Student 7

The journal entries of Student 7 did not contain generalized words from the lists of words learned during either whole word or individual letter self-correction sessions.

Student 8

The journal entries of Student 8 did not contain generalized words from the lists of words learned during either whole word or individual letter self-correction sessions.

In summary, four of the eight students generalized four or less words learned under both self-correction conditions. Little generalization occurred for either condition.
Pre- and Posttest Measures

The Test of Written Spelling-3 (Larsen & Hammill, 1994), was administered four school days before data collection began and two weeks after the last data point was taken. The purpose of the test administration was to obtain descriptive information regarding each participant's level of spelling achievement rather than an effort to measure any change in spelling proficiency as a result of the study. Individual results of the pre- and posttesting are summarized in Table 9.

The TWS-3 was used to determine standard scores, spelling ages, and grade equivalents for predictable, unpredictable, and total words. Standard scores across students ranged from 67 to 95 on the pre-test. Posttest standard scores across students ranged from 77 to 97. Spelling ages across students ranged from 6.3 to 9.9 on the pre-test. Posttest scores for spelling ages across students ranged from 6.4 to 10.3. Pre-test grade equivalent scores across
Table 9
TWS-3 Total Words. Pre- and Posttest Standard Scores, Spelling Ages, and Grade Equivalents Across Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Standard Score Pre/Post</th>
<th>Spelling Age Pre/post</th>
<th>Grade Equivalent Pre/Post</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>88/89</td>
<td>6.3/6.4</td>
<td>.8/.9</td>
</tr>
<tr>
<td>2</td>
<td>92/97</td>
<td>6.7/7.7</td>
<td>1.1/2.1</td>
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<tr>
<td>3</td>
<td>67/77</td>
<td>6.4/7.3</td>
<td>.9/1.8</td>
</tr>
<tr>
<td>4</td>
<td>84/96</td>
<td>7.4/9.4</td>
<td>1.9/3.9</td>
</tr>
<tr>
<td>5</td>
<td>82/82</td>
<td>7.3/7.6</td>
<td>1.8/2.0</td>
</tr>
<tr>
<td>6</td>
<td>75/81</td>
<td>7.0/7.4</td>
<td>1.5/1.9</td>
</tr>
<tr>
<td>7</td>
<td>95/97</td>
<td>9.9/10.0</td>
<td>4.2/4.5</td>
</tr>
<tr>
<td>8</td>
<td>93/96</td>
<td>9.4/10.3</td>
<td>3.9/4.8</td>
</tr>
</tbody>
</table>
students ranged from .8 to 4.2. Posttest scores across students ranged from .9 to 4.8. Total gain in months across students ranged from .1 to 24.

**Social Validity for Students**

Students were asked a series of questions regarding their opinion about the self-correction methods used in the study. The experimenter read the questions to the group and the students wrote their responses on the questionnaire.

**Question 1. Which method did you like best?**

All eight students indicated that they liked the whole word self-correction method because they thought it was easier to use and they felt it took less time. Student 2 liked it because, "You did not have to rite the marks." (sic)

**Question 2. Which self-correction method helped you learn your spelling words better?**

Six students circled whole word. They felt they received more practice and learned more, and that it was easier to remember how to correct and quicker to implement. One
student circled individual letter because the editing helped
him focus more on the task. One student circled both
individual letter and whole word because both conditions
required practicing correct spelling.

Question 3. Do you think you could use one of the self-
correction methods on your own?

Three of the eight students answered "yes". Four
students answered "no" and one circled both "yes and no".

Question 4. If your answer to number 3 was "YES", how would
you use one of the self-correction methods on your own?

Of the three students who answered "yes", one student
wrote that a family member would dictate the words to him,
one said a friend would dictate the words, and one wrote, "I
would write it 5 times." (sic)

Social Validity for Teachers

Teachers of the students who participated in the study
were asked to complete questionnaires concerning their
opinions about any changes in spelling performance and
attitude toward school in general.

**Question 1. Did you notice that N. spelled more words correctly in his/her written work in the past seven weeks?**

Two teachers circled "yes". Five teachers circled the other choice: "maybe, didn't notice". When asked to comment, the teachers' responses ranged from "the student tried harder", "wrote more in class", "worked on and made fewer errors in spelling in class", to "not sure", "didn't see too much change".

**Question 2. Did you notice any changes in spelling performance on spelling tests in the last seven weeks?**

Teachers for three of the students circled "yes". When asked to comment, they replied that the students tried harder, and they were motivated to perform better. Teachers for the other five students circled "no". When asked to comment, the teachers felt there was no change related to the study.

**Question 3. Did you notice a change in attitude toward schoolwork in general on the part of your student?**

The teachers of five of the students circled "yes". When
asked to comment, they noted increased confidence in classroom performance. The teachers of three of the students circled "no". When asked to comment, they stated the attitudes of their students stayed the same as before.
Chapter IV

DISCUSSION

This chapter discusses the findings of the study in relation to the research questions presented in Chapter I. In addition, the limitations of the study, classroom applications, and suggestions for future research are presented.

The purpose of the study was to compare the effects of two forms of self-correction (whole word and individual letter) on the acquisition, maintenance, and generalization of spelling words for eight elementary school students of different ages and spelling abilities. The results of the study will be discussed in terms of the research questions that follow. In the discussion that follows, the students are grouped according to grade level: Students 1 and 2 were primary, Students 3 through 6 were third graders, and Students 7 and 8 were fourth graders.
Research Question One

What is the effect of whole word self-correction on the acquisition (weekly spelling tests), maintenance (delayed spelling tests), and generalization (written expression in journal writings) of unknown spelling words? The mean percentage of words learned per week under this condition across students was 68%. Students 1 and 2 (who were presented with only ten words per week) acquired an average of 6.5/10 words per week (or 65% of their unknown words). Students 3, 4, 5, and 6 (who were presented with 15 words per week) acquired an average of 10/15 words per week (or 66% of their unknown words). Students 7 and 8 acquired an average of 11/15 words per week (or 73% of their unknown words).

Overall, using the whole word method, the students acquired between 65% and 73% of their list words on a weekly basis.

On the two-week delayed spelling posttests, the average percentage of words maintained was 49% across students. Student 2 maintained an average of 4.7/10 words per week (or
47% of learned words). A mean could not be obtained for Student 1 because of lack of data points. Students 3, 4, 5, and 6 maintained an average of 5.5/15 words per week (or 36% of learned words). Students 6 and 7 maintained an average of 10/15 words per week (or 66% of learned words). Overall, students maintained between 47% and 66% of their acquired words over the two-week period.

Due to the small amount of data collected, it is difficult to make any kind of statement about the success or failure of the ability to generalize words using the whole word self-correction condition. The data did show that a total of five words were generalized successfully in the journal writings of Students 2 and 6.

In summary, students acquired 68% of unknown words and maintained the correct spelling of 49% of the acquired words. Generalization data indicated few students used target spelling words in written journal writings. In relation to this question, one study (McGuffin, 1995) compared whole word
self-correction with traditional spelling methods. During the whole word sessions, the students acquired an average of 84.5% of unknown words and maintained an average of 85.9% of acquired words. The findings of this study support McGuffin's study only in the respect that unknown words were acquired and maintained during whole word sessions.

**Research Question Two**

*What is the effect of individual letter self-correction on the acquisition (weekly spelling tests), maintenance (delayed spelling tests), and generalization (written expression in journal entries) of unknown spelling words?* The average percentage of words learned under this condition across students was 59%. Students 1 and 2 acquired a mean of 4/10 words per week (or 40% of their words). Students 3, 4, and 6 acquired a mean of 10.3/15 words per week (or 68% of their unknown words). Student 5 had insufficient data points to calculate a mean. Students 7 and 8 acquired a mean of 10.5/15 words per week (or 69.5% of their unknown words).
The third and fourth grade students performed similarly under this condition in that their percentage of acquired words differed by one word in favor of the fourth graders. Overall, the students acquired between 40% and 69.5% of their word lists on a weekly basis using this method of self-correction.

On the two-week delayed spelling posttests, the average number of words maintained ranged from 3.5/10 (Students 1 and 2) to 7/15 (Students 7 and 8). Students 4 and 6 maintained an average of 6.3/15 words (or 42% of their learned words). Students 3 and 5 had insufficient data points to calculate a mean. Under the individual letter self-correction condition, students maintained between 35% and 46% of their acquired words. The average percentage of words maintained across students was 41%.

The effects of the individual letter self-correction on generalized words in journal entries was difficult to determine due to the small amount of data collected. The data showed that a total of eight words by four students were
spelled correctly in generalization samples.

In summary, students acquired 59% of unknown words, and maintained the correct spelling of 41% of their learned words. Generalization data indicated few students used target spelling words in written journal entries. Previous research by McNeish (1985), Okyere (1991), and Wirtz (1992), states that individual letter self-correction was more effective in acquiring, maintaining and generalizing spelling words than the traditional methods of spelling instruction. This study compared individual letter self-correction with whole word self-correction, thus, the findings can only substantiate previous research in that spelling words were acquired and maintained under the individual letter condition.

Research Question Three

Can it be determined which, if either, of the two forms was most effective?

Previous research in spelling and self-correction focused on comparing the self-correction method of learning
words with traditional spelling methods. McNeish (1985), Okyere (1991), and Wirtz (1992) used individual letter self-correction versus traditional spelling methods and reported results which clearly indicated that students using individual letter self-correction had an increased number of words learned (i.e., acquired, maintained, and generalized) over the traditional method of spelling. McGuffin (1995) compared a traditional spelling method with a form of self-correction different from that used in the aforementioned studies. In her study, students wrote the entire word above the misspelled word rather than using editing marks to check every letter. McGuffin's data confirmed and replicated the results of McNeish, Okyere, and Wirtz in that the students acquired and maintained more words using the self-correction method over the traditional methods used in the classroom.

This present study compared the two forms of self-correction outlined above with respect to students' spelling performance. Data indicated that the whole word method of
self-correction produced slightly higher weekly test scores
during the acquisition phase of learning for five of the eight
students. The data showed that these students acquired an
average of 2.2 more words under the whole word condition than
under the individual letter self-correction condition.
Extrapolated over the course of a school year, on average,
students have the potential to acquire 79 more words per year
using whole word self-correction relative to individual letter
self-correction in spelling.

However, there may be a correlation between the higher
test scores for students who performed better under the whole
word self-correction condition and the number of practice
trials they were provided via this method. The students in
question practiced their words an average of 1.6 times per
session over the individual letter self-correction method. In
other words, the whole word method allowed for higher
opportunity to respond (up to four trials per session) than the
individual letter method (up to two trials per session). Since
opportunity to respond has been demonstrated to be a key variable in acquiring a new skill (Greenwood, Delquardi, & Hall, 1984; Heward, Courson, & Narayan, 1989), perhaps the improved performance of students using whole word self-correction relative to individual letter self-correction may be attributed to the difference in students' opportunity to respond under both conditions.

For two of the students in the study, however, higher test scores were recorded during the individual letter self-correction method. For these students, the number of practice trials was also greater under the whole word condition than under the individual letter condition. Differences in opportunity to respond did not appear to impact the performance of these two students. The results for these students may reflect a difference in preferred learning styles (i.e., their performance may have been facilitated by using part-to-whole strategy) than a difference in the effectiveness of self-correction methods.
One student (Student 3) performed equally under both conditions. It was interesting to note that his learning trials for each condition were also distributed equally between the two conditions.

Whether the whole word or individual letter method of self-correction significantly affected the maintenance phase of the learning process is less clearly delineated by the data. A comparison between the two self-correction forms can be made for Students 7 and 8. The data showed that they maintained three more words per week during the whole word method than during the individual letter self-correction method. Extrapolated over the course of a school year, the index suggests that on average, these students have the potential to maintain 108 more words per school year.

Of the other six students, data was insufficient for comparison purposes for Students 1, 3, and 5. Students 2 and 4 exhibited minimal differences between the two forms of self-correction (less than .5) on two-week delayed posttests.
Research Question 4

Do the students have a preference for either whole word or individual letter self-correction? All eight students preferred the whole word self-correction method over the individual letter self-correction method. The students reported it was easier to correct spelling attempts with whole word self-correction and that it took less time to correct with this method.

When asked which self-correction method helped them learn their words better, six students believed whole word self-correction was better for them, one felt individual letter was better for learning words, and one said both. It was interesting to note that one student's data contradicted his preference for whole word self-correction, as he learned more words under the individual letter method than under the whole word self-correction method.
Research Question 5

Will the use of self-correction improve students’ overall spelling performance as measured by a pre- and post standardized test? All eight students showed an increase of one month or more in terms of spelling grade level growth as indicated by the Test of Written Spelling-3 (Larsen & Hamill, 1994). The average gain was eight months with a range from one month to 24 months. Given the duration of the study, this gain was more than what was expected. Clearly, however, any gain could not be attributed to either condition.

Summary of the Findings

The majority of the students in this study (5/8) performed better with the whole word self-correction form than with the individual letter self-correction form on weekly spelling tests (i.e., during the acquisition phase of learning). Data does not suggest a clearly superior method with regard to the maintenance phase of learning (i.e., performance on delayed posttests), although a slight difference was observed in favor
of whole word self-correction over individual letter self-correction. Insufficient generalization data made the interpretation of the effects of both methods difficult. The data for the few students who did generalize words suggests that more words generalized under the individual letter self-correction condition than the whole word self-correction condition.

Limitations of the Study

There were several limitations to the study. The time of day and time of year during which the study was conducted affected student absences and student motivation. The length of the experiment may have affected students' performance as well. Pretesting the students only once to determine unlearned words may also have limited the study. These limitations are discussed in detail below.

Due to the experimenter's work schedule, the study was conducted at 4:00 p.m. during the afternoon child-care program. The students had been in school for six hours and out of school
one hour by the time they arrived for the study. The students were often pulled from an activity they would have preferred to continue in order to participate in the study. At times, these two factors contributed heavily to the effort they exhibited during the study. Parents also picked up students early for appointments, thus some of the students did not have the same amount of time to practice as those who stayed the entire period. After school activities accounted for some of the absences in data collection.

The time of year during which the study was conducted (Winter quarter) may have limited the study as well. For two weeks in February the school population was decimated by flu and strepp infection. Therefore, attendance at the study was marginal, with only three to four students attending experimental sessions. The last two weeks of the study brought exceptionally mild weather and therefore a lack of interest to be in the building and participating in the study on the part of the students.
As stated previously, the study was conducted over the course of the Winter academic quarter, a ten week period. Due to professional leave scheduled in the beginning of the year, the study did not begin immediately after Christmas break. Allowing one week for training left seven weeks for data collection. Additional time would have been beneficial in collecting a greater number of data points.

Due to the time of day, the number of students to be tested, and the different lists that were used, students were pretested once for unknown words. Providing the students with two opportunities for assessment would have increased the likelihood that the words were truly unknown.

Implications for the Classroom

This experiment was conducted with students across grade levels and abilities. Previous studies (McGuffin, 1995; McNeish, 1985; and Okyere, 1991) drew solely from special education populations. This study drew from the general, as well as the special education, population thus more clearly
approximating the make-up of a classroom.

Conducting the study across grade levels showed that self-correction was not bound by developmental abilities. All the students were successful in learning the two forms of self-correction and applying them. The first grader was less fluent with the self-correction form due to developing small motor control issues; nevertheless, she learned both methods.

Both self-correction techniques were easy to implement. The self-correction approach is practical in terms of student time as well. Students spent 15 minutes practicing their words three times a week and a maximum of ten minutes taking their tests. In terms of teacher time, this strategy could easily be incorporated into a spelling buddy system or centers in which a number of students listen to the same tape recorder. In this study, three students used one tape recorder. The students motivated each other by sharing their progress.

Studies by Okyere (1991), McNeish (1985), and Wirtz (1992) have shown that self-correction improved the
acquisition, maintenance, and generalization of unknown list words. These studies also showed that students enjoyed using the self-correction strategy. Improvement and enjoyment are important factors in planning for success in the classroom.

Recommendations for Future Research

1. A replication of this study conducted during school hours rather than after school would allow for more experimental control.

2. A wider variety of methods with which to probe for generalization is recommended. Other forms of written expression across subject areas could be accessed (e.g., classroom samples, homework assignments, rough drafts of school assignments).

3. To increase the amount of words used in generalized writing, perhaps the experimenter could set the occasion to use the learned words, explaining to the students that their written work would be checked, thus motivating the students to consciously incorporate their words in
their written work.

4. Conduct the study with an entire classroom population for ten to 15 weeks, thus providing more time for differences, if they exist, to surface.

5. Conduct a study incorporating traditional spelling methods with the two self-correction methods to further quantify/replicate research in this area.

**Summary**

Spelling is a proven area of difficulty for students in general and in special education. The purpose of this study was to compare the effects of two forms of self-correction (whole word and individual letter) on the acquisition, maintenance, and generalization of unknown spelling words across grade levels and abilities.

Eight students from a suburban elementary school in central Ohio, representing the first through the fourth grade levels and varying spelling abilities, served as subjects in an alternating treatment experimental design. The study was
conducted during the after-school child-care program in the elementary resource room.

Results indicate that the majority of the students learned more words in the acquisition phase of learning using the whole word self-correction method versus the individual letter self-correction method. There was a slight difference in favor of whole word for the maintenance phase of learning as well. Generalization data was too minimal, making analysis of effects difficult.

Social validity data indicated that the students preferred the whole word method of self-correction to the individual letter method. First and third grade teachers noticed a difference in spelling in their students' written work. Second and fourth grade teachers did not notice a difference.

Overall, self-correction shows promise as an effective instructional method in spelling. Future research may determine maximally effective self-corrective methods for students with spelling difficulties.
APPENDIX A
PARENT LETTER AND
PERMISSION FORM

133
Parent Consent Form For Child's Participation in Educational Research

I agree to allow my child to participate in a research study investigating a teaching method to improve spelling instruction. This research will be conducted in the Edison Elementary School building during a portion of the afternoon F.A.S.T. program under the direction of Dr. Timothy Heron. I understand that the research will be carried out for a short time each day, Monday through Friday, for approximately 15-20 minutes. The study will be conducted during the months of January, February, and March, 1995.

I understand that my child's identity will not be revealed to anyone not directly involved in conducting the research by means of publication, document, video tape, photograph, computer storage, or any other form of report developed from this research, unless I give specific permission that my child may be personally identified. Additionally, I understand that I may withdraw my consent for my child's participation at any time.

________________________________________
Name of Child

________________________________________
Signature of Parent or Guardian

Date

________________________________________
Holly Quigley, Master's Candidate

Date

c. Dr. Timothy E. Heron
APPENDIX B
WHOLE WORD
SELF-CORRECTION FORMS
APPENDIX C
INDIVIDUAL LETTER
SELF-CORRECTION FORMS
SELF-CORRECTION FORM

NAME ______________________
DATE ______________________

<table>
<thead>
<tr>
<th>Word List</th>
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<th>Column A-2</th>
<th>Column B-1</th>
<th>Column B-2</th>
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APPENDIX D
TRAINING SCRIPT
Student Training Script: Whole Word

Today I am going to introduce you to the first of two methods to self-correct your spelling words. The methods are called "self-correct" because, after writing your words, you will check your own work to find any mistakes you made in the spelling. Why are they called self-correct?

The first method is called the whole word self-correction method. What is the first method called? The spelling activity sheet for the whole word method looks like this (Show transparency on overhead). When you correct a word using this method, you will write the word above your misspelled word on the spelling activity sheet. Where will you write your correction? Now I am going to show you some examples of what the whole word self-correction form looks like and what it doesn't look like. (Show samples of form - no writing on them). How many columns are on the form? Are there any differences between the first and second columns? What is the difference? second and third columns? third and
fourth columns? Next I am going to explain how to use the form. You will receive a form each week with words written in the first column. The third and fourth graders will receive 15 words, the first and second graders will receive ten words. The first thing you will do is fold the column with your spelling words behind Column 1, so only Columns 1-4 are showing. Your words will be told to you one at a time on a tape recorder. You will write each word on the line below the dotted line in each box. Where will you write your words? How many columns will be showing? Where will the column be with your spelling words? After you have finished writing your last word, you will unfold the spelling word column. You will then begin to check your words. When you get to a word you misspelled, you will write the word correctly on the line above the dotted line. You will go through this same procedure for each word. I will check your work after you have finished all fifteen words. Here are some examples of what whole word correction looks like and what it doesn't look like. Let's
practice some together. Now I am going to give you some
words and let's see how you do on your own. Columns 2-4 are
for more practice. After you have finished self-correcting
your words, I will check to see that you have corrected them
properly and then fold both the list Word Column and Column 1
under. You will listen to the words and self-correct again.
Remember, the more times you write the words, the more
practice you will have.
Student Training Script: Individual Letter

The second method of self-correction is called individual letter self-correction. What is this method called? The spelling activity sheet for this method looks like this (Show transparency on overhead).

You will use four proofreader's marks to correct the individual letters of the words that you spelled incorrectly: (Place blank transparency on overhead.)

1. This mark, "^", means you forgot to write a letter and so that letter has to be added. For example, if you left out the letter "r" in the word "form" you would place the carrot "^" where the "r" belongs in the word and write the letter "r" above the carrot.

2. This mark, "0", means you should circle and leave out a letter that doesn't belong there. For example, if you wrote the word "friend" like "feriend", the first "e" would be circled.

3. This mark, "~", means to reverse the two letters where the mark is put between. For example, if you spelled the word
"find" as "fidn", you would put this mark between the "d" and the "n".

4. The last mark is a slash: "/". This mark tells you the wrong letter was used. Place a slash through the wrong letter and write the correct letter above it. For example, if you spelled "tree" as "trea", a slash would go through the "a" and an "e" would be placed above it.

You will use the proofreading marks on the activity sheets like the one you just saw (Place previously shown activity sheet on overhead). As you can see, the form contains five columns (Point out columns to students). By the way, how is this form different from the whole word activity sheet? (Students give appropriate answers followed by reinforcement.) As in the whole word form, the very first column will contain your list words. This column will be folded back like this (Demonstrate to students) so you cannot see the words. Again as with the whole word form, you will listen to the words on a tape recorder. You will write your
words as you hear them in Column A-1. (Model for students.) You will then unfold the list word column and begin to self-correct the words you had just written, using the editing marks. After you have completed looking at all the letters in the first word and corrected as needed, you will write the word correctly in Column A-2. You will then move to the next word, self-correct with the editing marks, and then write the word correctly in the column next to it. After you have finished self-correcting the last word, I will check your work to make sure you used the marks properly. Your paper will be folded back to Column B-1 and you will listen to the words and write them in that column. When you have written your last word, you will unfold the paper and self-correct the words as you did in Column A-1. If you spell a word correctly, place a check mark in Column B-2. (Model for students.) Let’s practice some together with the overhead. (Practice with blank transparency of individual letter form and then give them some sheets to practice on their own.)
APPENDIX E
STUDENT QUESTIONNAIRE
Questionnaire For Students

Verbal Directions: Think about the way you learned to spell during the study. Sometimes you used the whole word self-correction method and sometimes you used the individual letter self-correction method with editing marks. Please answer the following questions about these methods.

1. Which method did you like best? (circle one)

   Whole Word  Individual Letter

   WHY?_____________________________________________________________________

   _______________________________________________________________________

2. Which self-correction method helped you learn your spelling words better? (circle one)

   Whole Word  Individual Letter

   WHY?_____________________________________________________________________

   _______________________________________________________________________

3. Do you think you could use one of the self-correction methods on your own? (circle one)

   YES  NO

4. If your answer to #3 was "YES", how would you use one of the self-correction methods on your own?

   _______________________________________________________________________

   _______________________________________________________________________
APPENDIX F
TEACHER QUESTIONNAIRE
Questionnaire For Teachers

Directions: Please circle the answer that best agrees with your opinion for each question below.

1. Did you notice that N. spelled more words correctly in his/her written work in class during the last seven weeks?

   YES    NO    MAYBE/DIDN'T NOTICE

Comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. Did you notice any changes in spelling performance on spelling tests during the past seven weeks?

   YES    NO    MAYBE/DIDN'T NOTICE

Comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3. Did you notice a change in attitude toward schoolwork in general on the part of your student?

   YES    NO    MAYBE/DIDN'T NOTICE

Comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
APPENDIX G
INDEPENDENT VARIABLE
RELIABILITY MEASURE
INDEPENDENT VARIABLE RELIABILITY MEASURE

Circle One

Whole Word Method                          Individual Letter Method

1. Were the activity sheets given to the students? yes no
2. Was the timer set for 15 minutes?        yes no
3. Was each column checked after completion? yes no
4. Were the students monitored while working? yes no
5. Was the session ended when the timer went off? yes no
6. Were the activity sheets collected? yes no

Observer ________________________________

Date ________________________________
LIST OF REFERENCES


Horn, E. (1926). *A basic vocabulary of 10,000 words most commonly used in writing*. Iowa City: University of Iowa.


