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A Comparison of the Effects of Individualized Writing Instruction With and Without Phonemic Segmentation on the Standard Spelling Performance of At-Risk First Graders

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This work is dedicated to my husband, Bill Rhodes and my children, Cassandra, Billy, Jacob and Mackenzie through whose constant support and personal sacrifice, I have been able to achieve my dream.

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Abstract

A COMPARISON OF THE EFFECTS OF INDIVIDUALIZED WRITING INSTRUCTION WITH AND WITHOUT PHONEMIC SEGMENTATION ON THE STANDARD SPELLING PERFORMANCE OF AT-RISK FIRST GRADERS

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

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This study investigated the effects of individualized writing instruction with and without phonemic segmentation on the standard spelling performance of at-risk first graders. Forty-two students from fifteen non-public elementary school Chapter I programs participated in the study.

Subjects were pretested using the Yopp - Singer Test of Phoneme Segmentation to determine their phonemic awareness level. Students were matched in triads and placed in one of two treatment groups or the control group using a constrained random assignment procedure. The Basic Achievement Skills Individual Screener (BASIS) spelling subtest was administered to assess standard spelling performance.

The first treatment group received individualized writing instruction using a phonemic segmentation procedure based on the work of D. B. Elkonin and used in the Reading Recovery program for at-risk first graders. The second treatment group received individualized writing instruction where teachers supplied correct spellings. The control group received no additional writing instruction emphasizing spelling. Treatment occurred twice weekly for twelve weeks.

Following treatment students were reevaluated using the BASIS spelling subtest and Yopp-Singer Test of Phoneme Segmentation. The Cognitive Abilities Test was also administered to determine a cognitive ability level for each subject.

Data were analyzed using a 3X3X3 analysis of covariance. Due to the impact phonemic awareness and cognitive ability have on spelling performance, the study stratified students into high, medium and low phonemic awareness levels and high, average and low cognitive ability levels. Results indicated there were no differences among the groups following treatment. As the data analysis progressed a question as to whether either treatment improved phonemic awareness arose. Analysis of variance on the mean differences of phonemic awareness scores indicated there were no significant differences among the three groups.

Study results suggested that use of the Elkonin analysis phonemic segmentation procedure in isolation may have limited benefits in improving spelling for at-risk first graders. Additionally, the study pointed to the need for further research on phonemic awareness training programs and the importance of earmarking financial resources for students who will benefit most from phonemic awareness instruction.

CHAPTER I

Introduction

This chapter provides introductory information related to the research study. The chapter's eight sections include: (a) statement of the problem, (b) significance of the problem, (c) statement of purpose, (d) research questions, (e) definition of terms (f) summary of literature, (g) methodology, (h) summary.

Statement of the Problem

A move toward holistic language arts instruction in the United States occurred after the issuing of Becoming A Nation of Readers: The Report of the Commission on Reading in 1984 (Anderson, Hiebert, Scott, & Wilkinson, 1984). This trend, based on the work of Americans Kenneth and Yetta Goodman (1986), gained further momentum from research conducted by Australians and New Zealanders such as Brian Cambourne (1984), Marie Clay (1985) and Don Holdaway (1986).

Cambourne's (1984) inquiry into how children learn language indicated that several environmental conditions

were necessary for children to develop oral language. Whole language proponents (Butler, 1988; Routman, 1988) suggested that when these environmental factors were present, reading skill developed naturally. Considering these findings, some American schools began to add whole language elements to their classrooms.

Further review of research related to the components of whole language (Butler, 1988; Hillerich, 1990; Watson, 1989) showed that nine to ten elements were usually present in natural language learning classrooms. Direct instruction in spelling was noticeably absent from these required elements. Spelling instruction typically occurred within the context of student writing (Routman, 1988). Teachers encouraged the use of invented spelling so students could focus on the content of their writing (Routman, 1993). Students corrected spelling errors during the editing phase of the writing process.

Although Klesius, Griffith and Zielonka (1991) found no significant difference in spelling scores between students in whole language and traditional instructional groups, educators continued to express concern over spelling achievement levels within whole language classrooms (Gentry & Gillet, 1993; Levey,

1995). First grade teachers working in a suburb of Richmond, Virginia also noted this concern (K. Hicks & B. James, personal communication, November 1992). They observed that children who participated in the Reading Recovery program for at-risk readers tend to become better spellers. Clay's (1979) original field trials and three year follow-up study (1993b), as well as results from The Ohio State University Reading Recovery research (National Diffusion Network, 1991) supported this observation by showing gains in spelling for Reading Recovery participants. More recently, in the New South Wales, Australia experimental evaluation of Reading Recovery, Center, Wheldall, Freeman, Outhred and McNaughton (1992) found spelling gains continued to favor Reading Recovery students 30 weeks after program implementation.

Progress in this field indicated three possible explanations for this observation. Perhaps the use of Elkonin analysis, a phonemic segmentation strategy, in Reading Recovery lessons caused spelling improvement (Center et al., 1992) or the fact that tutors did not accept invented spelling in Reading Recovery lessons increased the use of standard spellings (Clay, 1985). Finally, Center et al. suggested that Reading Recovery

students had greater exposure to words in context, thus enhancing their spelling skill.

Two further factors, intelligence and phonemic awareness, related to standard spelling performance. In their comparative study of whole language and traditional classrooms, Klesius, Griffith & Zielonka (1991) noted that students who had better ability to hear the individual sounds in words scored higher on spelling measures regardless of the type of reading instruction received. Lie (1991) found first grade children with low general intelligence profited more from phoneme segmentation training than those with average or high intelligence.

The current study determined the effect phonemic segmentation had on the standard spelling performance of at-risk first grade students and sought to establish whether individualized writing instruction without this analysis produced the same results. Due to the impact phonemic awareness has on spelling performance, the study stratified students into high, medium and low phonemic awareness levels. The students were also separated into three levels of cognitive ability (high, average and low) for this analysis of standard spelling performance.

Significance of the Problem

Through our personal use of language, we transmit information about our social standing and educational level. Hodges noted, "in many ways our society values written language even more highly than spoken language, perhaps because writing is a visible and permanent record of our language habits" (Hodges, 1981, p. 1).

Bolton and Snowball (1993) believed children that were "denied an opportunity to learn conventional spelling" could become disadvantaged. The researchers stated, "many poor spellers have low self-esteem in relation to their writing ability...[which] is reinforced by society's tendency to draw subjective conclusions about writers' general attributes if their written work is not word perfect" (Bolton & Snowball, 1993, p.2).

According to Hodges, spelling played an important role in transmitting our culture. Spelling error reflected poorly on the author and impeded communication. Therefore, Hodges considered spelling instruction an important part of the curriculum at all grade levels. Unfortunately, he found spelling

instruction relegated primarily to the elementary level (Hodges, 1982).

Spelling instruction varied based on the philosophy of reading and language arts instruction a school system embraced. In traditional classrooms that used basal reading approaches, spelling instruction typically consisted of memorizing a list of words to reproduce when tested (Bolton & Snowball, 1993; Henderson, 1985; Novelli, 1993). Teachers expected the use of standard spellings in students' written work in these classrooms.

Whole language proponents believed that children learned language naturally and, therefore, supported the use of invented spelling (Routman, 1988, 1993). The whole language approach contrasted significantly with the traditional basal approach. Although invented spelling freed a child to get his ideas on paper, the results were often unintelligible (Read, 1971). Overall, the whole language movement reduced the level of traditional skills-oriented spelling instruction (Routman, 1993).

One program, which shared the basic tenets of whole language programs, treated spelling accuracy as important. The Reading Recovery program, for at-risk

readers, required students to use standard spellings or to analyze unknown words to spell them correctly. This analysis, modeled after the work of D.B. Elkonin, was a form of phonemic segmentation. Teachers asked Reading Recovery students to separate words into their individual sounds and then record what they heard accurately. Students who received instruction in the Reading Recovery program showed gains in spelling skill as measured by the program's writing vocabulary test. Additionally, in the three year follow up study of Reading Recovery, mean spelling on the Peters Word Spelling Test for successfully discontinued Reading Recovery students remained in the average range (Clay, 1993b).

As indicated by literature in the field of spelling, gains in spelling performance were positive for students at-risk for literacy acquisition. If the phonemic segmentation provided in the writing portion of the Reading Recovery program increased spelling performance, further study was warranted. If a positive effect was found, this process might enhance the standard spelling performance of at-risk first grade students in other settings.

Statement of Purpose

The purpose of this study was to determine whether individualized writing instruction using the phonemic segmentation technique modeled on the work of D.B. Elkonin would affect the standard spelling performance of at-risk first grade children. The researcher analyzed results to determine whether level of phonemic awareness or cognitive ability had an impact on standard spelling performance. Based on the outcome, study results could guide first grade spelling instruction in the future.

Research Questions

The following questions provided the focus for this study:

1. Did a difference in standard spelling performance exist among at-risk first graders who received individualized writing instruction including phonemic segmentation, those who received individualized writing instruction without phonemic segmentation but where correct spellings were provided and those who received no additional instruction?

2. What effect did the use of individualized writing instruction including phonemic segmentation have on the standard spelling performance of at-risk first graders?
3. What effect did the use of individualized writing instruction without phonemic segmentation but where correct spellings were provided have on the standard spelling performance of at-risk first graders?
4. Was there a difference in standard spelling performance between students with high, medium and low phonemic awareness levels before and after treatment?
5. Was there a difference in standard spelling performance between students with low, average and high levels of cognitive ability before and after treatment?

A sixth question emerged following the initial data analysis. Was phonemic awareness significantly improved through either treatment? This question was explored further in Chapter IV.

Definition of Terms

For the purposes of this study the following terms were defined:

1. Whole Language. "A set of beliefs, a perspective. Whole language is based on the following ideas: (a) language is for making meanings, for accomplishing purposes; (b) written language is language - thus what is true for language in general is true for written language; the cueing systems of language (phonology in oral, orthography in written language, morphology, syntax, semantic, pragmatics) are always simultaneously present and interacting in any instance of language in use; (d) language use always occurs in a situation; (e) situations are critical to meaning-making" (Altwerger, Edelsky, Flores, 1987, p. 145).
2. Whole Language Program. "One in which reading, writing, listening and talking are integrated in a stimulating natural language-learning environment" (Butler, 1988, p.3).

3. Phonemic Awareness. "The knowledge that the spoken word can be broken down into smaller units (i.e., its phonemes)" (Juel, Griffith and Gough, 1986, p.144).
4. Phonological Awareness. "The ability to reflect on and manipulate the phonemic elements of speech" (Iversen & Tunmer, 1993, p. 114). It is a person's "conscious awareness of the phonemic segments within spoken words (eg. /hit/ = /h/ /i/ /t/, /day/ = /d/ /a/)" (Schlagel, 1992, p.55).
5. Phonemic Segmentation. Separating words into individual sounds (eg. me = /m/ /e/).
6. Reading Recovery. "An intensive one-to-one intervention program for the poorest readers (lowest 20 percent) in first-grade classrooms...The primary goals of Reading Recovery are to reduce reading failure through early intervention and to help children become independent readers" (Pinnell, DeFord, Lyons, 1988, p.2).
7. Standard Spelling. Accepted conventional written formation of words.

8. Invented Spelling. Written approximations of words based on a student's ability to "match a letter name with each phoneme" heard (Henderson, 1985, p.114).
9. Chapter I Program. United States federal government program for upgrading the education of children who are economically and culturally disadvantaged. Originally funded under the Elementary and Secondary Education Act of 1965.

Summary of Literature

In 1984, the Commission on Reading released its recommendations for improving reading instruction in the United States. Becoming a Nation of Readers, the Commission's final report, suggested that children should spend less time completing skill sheets and workbook pages during instructional time and spend additional time in meaningful reading and writing activities. They also suggested that early childhood reading readiness programs focus on developing oral language, reading and writing rather than cutting with scissors and recognizing shapes. The Commission called for a change in reading instructional materials, asking that they be interesting and give children an

opportunity to apply the phonics skills they had learned. These recommendations led to a shift in the philosophy of teaching reading from total basal instruction to a more holistic methodology (Anderson, Hiebert, Scott, Wilkinson, 1985).

Kenneth and Yetta Goodman explored the use of holistic language arts teaching methods in the United States. They indicated that reading programs should use relevant literature to increase the instructional focus on meaning. Kenneth Goodman criticized the use of arbitrarily chosen skills as a basis for instruction and suggested that teachers should not expect children to learn from small parts (letters) to large parts (whole text). Goodman professed that teachers must believe all children are capable of learning language to embrace a whole language philosophy (Goodman, 1986).

Brian Cambourne, an Australian researcher, also supported this notion. He indicated that most parents assume their children will learn to talk; however, they do not always believe their children will learn to read. Cambourne observed children to see what conditions prevailed in oral language learning. He suggested these seven conditions (immersion, demonstration, expectation, responsibility, employment, feedback, approximation)

were applicable to all language learning situations (Cambourne, 1984).

New Zealander, Don Holdaway, indicated that the condition of approximation, or making close attempts at words, provided the foundation for mature processes in reading. He rejected the traditional method of instruction in reading and suggested that educators neglect the satisfaction children receive from reading real literature. Holdaway argued that teachers need to teach reading strategies rather than isolated skills (Holdaway, 1991).

Further support for holistic instruction came from Marie Clay's observational research of young readers (Clay, 1979). In her initial research, she found that children who had directional difficulties were unable to hear sounds in words. This slowed their reading progress. Clay suggested that reading programs need to be flexible to address the variety of difficulties encountered by beginning readers.

Butler addressed the components of whole language reading programs (1988). She used Cambourne's research as a basis for delineating ten components of whole language classrooms. Hillerich (1990) also discussed

the elements of whole language classrooms. Both indicated the meaningful use of rich literature was an essential component; however, direct spelling instruction was noticeably absent from both lists.

Whole language programs based spelling instruction on research by Charles Read. In 1971, he reported that children were able to categorize speech sounds. After studying 2,517 words written by 32 children aged 2.5 to 4 years, Read showed that children invented word spellings that had consistency and similarity across the sample. In his study, the introduction of standard spelling did not immediately influence the children. However, the invented spellings spontaneously disappeared for this group of middle class youngsters once they reached the age of six.

Henderson (1980) built on the work of Read by studying the stages of word knowledge. He found that spelling fell into five stages. The first stage was experimental in nature where the child imitated writing. In the second and third stages, students relied heavily on the use of invented spelling. In the final two stages invented spelling decreased as students began to understand the consonant doubling and etymological principles of spelling.

Henderson indicated that children must develop a concept of correct spelling; therefore, educators could not rely on incidental instruction during writing activities for their spelling program. Henderson noted that even when a child was able to spell alphabetically by matching letters to their sounds, he did not always produce a correct spelling. Writing activities gave children an opportunity to apply their spelling ability but would not substitute for direct instruction.

In whole language programs, most spelling instruction occurred during the editing phase of the writing process. Proponents encouraged teachers to assist children by correcting their invented spellings during one-on-one writing conferences (Routman, 1993). The individualized nature of a writing conference allowed teachers to select words for study relevant to each child.

Two individual attributes of students, cognitive ability and phonemic awareness, influenced children's success with spelling. Stage and Wagner (1992) found that a limited working memory adversely affected young children's spelling performance. According to Seymour and Porpodas (1980), spelling development required the establishment of permanent storage for word-specific

information. The researchers indicated students need two types of knowledge, grapheme-phoneme correspondence and lexical-morphemic knowledge, to understand spelling. Children developed visual representations of words in their memory through the use of sequential decoding skills in reading. Analogy strategies (comparing a new word to a known word), hierarchical decoding strategies (based on rules such as CVCe [consonant vowel consonant e] where e marks a long vowel), and phonemic strategies were also useful in spelling (Marsh, Friedman, Welch, Desberg, 1980).

Klesius, Griffith, and Zielonka (1991) found phonemic awareness influenced a child's spelling ability in a study that compared whole language and traditional classrooms. The researchers discovered that highly phonologically aware children continued to be more phonologically aware than their peers after a year's instruction. These highly phonologically aware students also had greater skill in spelling. The year-end measures which evaluated reading, writing and spelling skills showed no significant differences between the whole language and traditional instruction groups. The authors concluded that the phonological awareness taught

directly in traditional classrooms could be learned indirectly with a whole language approach.

Phonemic awareness training programs showed a positive effect on both reading and spelling (Ball & Blachman, 1991; Tangel & Blachman, 1992). Lie (1991) compared the effects of two forms of phonological training in his research with Norwegian first grade children. Students trained using phoneme segmentation or sequential treatment scored higher in spelling than those who received positional phoneme isolation training. The significant interaction between the type of treatment and intelligence was of particular note. Lie's results showed lower level children benefited most from phonologic training.

The Reading Recovery program, a one-on-one intervention program for at-risk first graders developed by Marie Clay, considered phonemic awareness important in beginning reading. Clay designed her program after careful observation of successful beginning readers. Daily Reading Recovery instruction required children to read several familiar books, read a book for teacher diagnosis, and finally to read a new text. In the writing component, children wrote one sentence of their choice. Teachers expected correct spellings in all

written work. Students analyzed selected unknown words using a phonemic segmentation strategy developed by Russian psychologist, D. B. Elkonin (Clay, 1985).

Elkonin (1973) believed that children must understand the sound structure of spoken words before beginning reading. He developed a system of analyzing sounds to improve a student's ability to separate individual sounds in words. Elkonin's belief that readers derive meaning from the sound of words served as the impetus for his work.

In 1972, Wilder tried Elkonin's segmentation strategy with American students. Unfortunately, he was unable to replicate the positive results Elkonin achieved with Russian children. Wilder suggested language differences and the age of his subjects might account for this failure. The limited description of Elkonin's work available from the former Soviet Union also contributed to the difficulty of replication.

Elkonin's segmentation method required children to analyze by sound orally and then with preprinted letter tiles. In Reading Recovery, Clay took this activity a step further by asking children to write the letters themselves and then transfer the entire word back into

the child's own sentence (Clay, 1993b). This process might explain the growth in correctly spelled words as measured by the Writing Vocabulary test portion of the Reading Recovery diagnostic survey. (Clay, 1985; Ohio State University, 1988). Researchers in New South Wales also supported this premise by suggesting that Elkonin analysis contributed to the positive spelling scores of Reading Recovery students in their experimental program evaluation (Center et al., 1992).

In conclusion, research related to the Reading Recovery program showed student gains in spelling skill for at-risk first grade students (Center et al., 1992; Clay, 1979, 1993b; Glynn, Crooks, Bethune, Ballard & Smith, 1989; National Diffusion Network, 1991). Through the use of Elkonin analysis in Reading Recovery lessons, phonemic awareness was enhanced. Phonemic awareness training, similar to Elkonin analysis, proved successful in increasing spelling scores, particularly with students of low intelligence (Ball & Blachman, 1991; Lie, 1991). This research when coupled with a lack of information related to the specific influences of Reading Recovery's individualized writing component, suggested further study was warranted to determine

whether Elkonin analysis effected the standard spelling performance of at-risk first graders.

Methodology

This study employed a pre-test - post-test three factor design. A forced random sample of matched triads was used to create three groups of 24 students. The first treatment group received individualized writing instruction using phonemic segmentation based on Elkonin analysis. The second group received individualized writing instruction without phonemic segmentation but where the teacher supplied correct spellings. The control group received no additional writing instruction emphasizing spelling. The subjects were classified as having low, medium or high phonemic awareness level and low, average or high cognitive ability level.

The Basic Achievement Skills Individual Screener (BASIS) spelling subtest measured the dependent variable, spelling performance score. Prior to random assignment and following treatment, the Yopp-Singer Test of Phoneme Segmentation assessed each student's level of phonemic awareness. The results of the Cognitive Abilities Test were used to measure the first grade students' ability level.

The investigator drew the sample for this study from a population of all at-risk first grade students enrolled in fifteen Chapter I programs from non-public schools near the Richmond and Tidewater areas of Virginia. Certified teachers trained in Elkonin analysis provided treatment. Trained graduate students and reading specialists who were unaware of the treatment each student received administered the spelling and phonemic awareness tests. Each Chapter I teacher administered the Cognitive Abilities Test to her students as part of the on-going school assessment program.

The data were analyzed using a three factor analysis of covariance (ANCOVA) on spelling performance scores as measured by the Basic Achievement Skills Individual Screener (BASIS) spelling subtest. The three factors included cognitive ability with three levels, phonemic awareness with three levels and treatment groups with three levels. The pretest served as the covariate. Matched groups served as a blocking variable. Where appropriate, post hoc Tukey's t-tests were conducted for each independent variable.

The analysis of covariance statistical procedure was selected because of the use of a factorial design including the use of a pre-test as a covariate.

There were five possible limitations to the study. Mortality, the loss of subjects, and diffusion of treatment threatened the current research. Beginning the study with the largest sample available and isolating subjects as much as possible helped reduce these threats. Careful test administration and explicit procedures were used to diminish the effect of errors of instrumentation. The threats of resentful demoralization and compensatory rivalry, although minor, were reduced through the use of a non-invasive treatment design that attracted little attention from the control group and non-participating students.

Summary

The move toward holistic language arts instruction in the United States changed spelling instruction dramatically (Routman, 1993). Parents as well as educators shared concern about the success of school spelling programs and the use of invented spelling (Gentry & Gillet, 1993; Levey, 1995). The Reading Recovery program successfully increased spelling

performance with at-risk children (Center et al., 1992; Clay, 1979, 1993b; Glynn et al., 1989; National Diffusion Network, 1991). The use of Elkonin analysis, a phonemic segmentation technique, in the Reading Recovery program was thought to contribute to these improved spelling skills (Center et al., 1992).

Results from the current study indicated that the use of individualized writing instruction which employed phonemic segmentation did not improve spelling performance in at-risk first grade students more significantly than the alternative treatment or the control. Students in the first treatment group which included the phonemic segmentation based on the work of D.B. Elkonin showed the largest gain in mean phonemic awareness. The analysis of variance indicated there was not a significant difference in gain in phonemic awareness level among the two treatment and control groups. Therefore, the use of this phonemic segmentation procedure in isolation from other types of instruction may have limited educational benefit.

CHAPTER II

Review of Literature

Analysis of studies related to the proposed research falls into eight general areas. Initial discussion focuses on the shift in the philosophical context of language arts and reading instruction in the United States and its classroom implications including the use of individualized writing. From this global perspective, the review narrows its focus to look at spelling. The analysis then addresses the effects of cognitive ability and phonemic awareness on spelling. The review also considers results of phonemic awareness training programs. The literature review concludes with information on the Reading Recovery program, its instructional components and the use of Elkonin analysis. The literature and research review support the need to explore how the Elkonin analysis segmentation activity might affect the development of standard spelling performance and phonemic awareness.

Philosophical Shift in Reading Instruction

The report of the Commission on Reading, Becoming a Nation of Readers, served as an impetus for change in language arts instruction during the 1980's and early 1990's (Anderson, Hiebert, Scott & Wilkinson, 1984). The Commission presented 17 recommendations for improving instruction after reviewing literature in reading and related disciplines. Among these were a call for increased parental involvement in the educational process, a focus on reading, writing and oral language in preschool and kindergarten and instruction in comprehension strategies and applied phonics. The Commission also recommended that a larger portion of time be spent on actual reading and writing activities during well-organized classroom instruction. Members encouraged use of well-stocked libraries and comprehensible, interesting instructional materials. The Commission suggested that schools attract better prepared teachers and offer continuing staff development to keep experienced teachers abreast of changes in the field. The greatest impact of Becoming a Nation of Readers was to pave the way for a shift in philosophy from discrete skill teaching to a more holistic approach for teaching language processes.

Additional impetus for this movement came from reading programs in New Zealand, Australia and Canada where literacy rates were among the highest in the world. The Bulluck Committee report issued in 1975, provided early political support in Great Britain for a shift in methodology. The report called upon the government to make significant changes in objectives and curricula based upon research in language, thinking and learning. This highly discussed work brought language development to the forefront in Canada, Great Britain, New Zealand and Australia (Goodman, 1986).

In his book, What's Whole in Whole Language, Goodman indicated that the use of whole language in the United States was overwhelmingly a grassroots movement in 1986. Within several years, however, the nation shifted toward an emphasis on natural language learning. Direction for revision of the literacy curriculum in the United States came about because of a greater awareness of research from the other major English speaking countries and vocal advocates for this holistic philosophy. The works of Cambourne (1984), Holdaway (1979), Clay (1979) and others gave support to the Goodmans, leading to the adoption of whole language programs across the country.

Whole Language Philosophy and Components

Brian Cambourne provided early research to support a move to a natural language learning philosophy. In his study of how children acquire oral language, Cambourne found that seven environmental conditions had to be present for learning to occur. He indicated that these seven conditions were "relevant to all kinds of language learning" including learning to read, write and spell (Cambourne, 1984, p. 4).

Immersion, the first condition, existed when teachers flooded their students with language information presented in whole meaningful situations. Demonstration and expectation occurred when adults modeled language for children and anticipated the children's success as language learners. Condition four, responsibility, was evident when children took charge of their learning. The conditions of employment and feedback presented themselves as children in the study used language and adults provided supportive responses. The final condition, approximation, was commonly present in oral language development when adults accepted attempts at language that were not quite accurate. Cambourne found that approximations were less acceptable to adults in reading, when a child confused

words like father and daddy, than in oral language (Cambourne, 1984).

Don Holdaway (1979, 1991), also discussed the value of approximations in language learning. He proposed that approximation provided the foundation needed for more mature processes. Holdaway, in his rejection of traditional classroom reading instruction, suggested that a meaning centered curriculum was essential for language learning. He indicated that reading instruction should focus on strategies rather than discrete skills. Holdaway stated that the "major difference between 'skills teaching' and 'strategy teaching' concerned the presence or absence of self-direction on the part of the learner...In strategy teaching the teacher induces the learner to behave in an appropriate way and encourages the learner to confirm or correct his own responses" (Holdaway, 1979, p. 136).

Observational studies of young readers by Marie Clay also supported the need for learner independence and holistic instruction. Clay found that children made poor progress in language development for varied reasons. She suggested that reading programs need to be flexible with careful observation by classroom teachers to pinpoint causes of reading difficulty (Clay, 1979).

Many natural language learning proponents made attempts to describe the practices that occur in whole language classrooms. Advocates viewed reading as a natural act requiring the use of rich literature. Kenneth Goodman offered further insight into these characteristics when he suggested that whole language curriculums were dualistic, requiring language and thinking to develop simultaneously. Consequently, Goodman recommended that teachers plan thematic units to address both curricula (Goodman, 1989).

Hillerich's description of whole language classrooms divided instruction into nine major components. Proponents asked teachers to focus on the meaningful use of language within an integrated, developmental curriculum. Teachers used oral language as a bridge to print. Supporters also encouraged risk taking, reading of whole texts and reading for enjoyment (Hillerich, 1990).

Cambourne's conditions for language learning were the basis of descriptions of whole language classrooms by Andrea Butler (1988). Butler indicated that ten elements should be present in natural language learning classrooms including: shared book experience, reading to children, sustained silent reading, language experience

activities, modeled writing and children's writing. Content area reading and writing and opportunities for sharing were necessary for holistic instruction. Butler noted that most teachers chose between guided and individualized reading, therefore, only including nine elements in their instructional program.

Watson, on the other hand, suggested that "there is no such thing as an archetypical whole language classroom" (Watson, 1989, p.129). She believed certain experiences like daily reading by teachers, individualized reading, and children's writing appeared consistently in whole language environments. Additionally, Watson expressed her belief that classrooms should allow for socialization between students and encourage pupils to make links between reading and writing. Finally, Watson characterized teachers in whole language classrooms as being in a state of "planning to plan" where they finalized their curriculum only after becoming aware of specific student interests and needs (Watson, 1989, p. 136).

The area of spelling instruction was noticeably absent from the review of whole language components. Whole language advocates viewed spelling as part of the editing process in writing. Teachers taught spelling to

improve student writing, with words for instruction selected based on individual student needs.

Individualized Writing Instruction

Writing instruction in whole language classrooms gave students an opportunity to use a process approach while focusing on their interests and needs. Teachers encouraged the use of invented spellings to represent unknown words in an effort to enhance composition. This type of writing instruction marked a dramatic change from instruction that occurred before the 1970's and the inception of the Bay Area Writing Project.

A review of literature on individualized writing instruction by Roberts (1983) attributed modern student-centered approaches to Great Britain's school system where students organized and planned their writing assignments. According to English teachers, constant correction and grammar instruction did not lead to precise expression or fluency. Proponents of individualized instruction viewed writing as an ongoing learning process best addressed in courses that "respond individually to each student's writing" (Fisher & Murray, cited in Roberts, 1983, p. 4).

Linda Best (1995) attributed gains in process writing approaches to cognitively oriented writing research. Best noted the process writing approach began largely as a result of pressure during the 1970's to improve student writing performance across the United States. Prior to this time, writing instruction aimed at having students create a product that mirrored great literary works. Teachers' informal classroom research provided a design for program improvement. Finally, writing research found a formal niche under the guise of cognitive psychology.

Best (1995) described the work of two sets of cognitive psychologists that had a significant impact on writing process instruction. Flower and Hayes (in Best, 1995) developed a cognitive model of composing which showed writing to be a recursive activity where writers engage in planning, writing, editing and revising activities simultaneously. Flower and Hayes viewed writing as thinking. This view raised instructional discussions from a focus on grammar to a focus on cohesive logical expression.

Bereiter and Scardamalia (in Best, 1995) discussed the role of metacognition in writing. They suggested that metacognition enabled writers to move from one

process to another. Metacognition, described as a management and monitoring activity, was characteristic of expert writing.

Cognitive writing research focused intervention techniques on process rather than product. Instruction occurred based on the notion that writing is a developmental process and there are no simple answers for resolving student weaknesses.

The focus on process writing was one of the basic tenets professed in the Bay Area Writing Project. The project, designed by a small group of educators in 1974, expanded into the National Writing Project (NWP). Seven basic assumptions provided the foundation for staff development conducted by the NWP:

1. Student writing can be improved by improving the teaching of writing, and the best teacher of teachers is another teacher.
2. Programs designed to improve the teaching of writing must involve teachers at all grade levels and from all subject areas.
3. The writing problem can best be solved through cooperatively planned university-school programs.

4. Change can best be accomplished, not by transient consultants or by prepackaged systems, but by those who work in the schools.
5. Meaningful change can occur only over time. Staff development programs must be ongoing and systematic.
6. What is known about the teaching of writing comes not only from research but from the practice of those who teach writing.
7. Teachers of writing must write (Goldberg, 1989, p. 67).

The National Writing Project, a very popular program, won praise from the Secretary of Education and the nearly one million teachers who attended its in-service sessions. It shaped the face of writing instruction in the United States and seven foreign countries. The NWP teachers training teachers model and the use of teachers as researchers spread throughout the United States.

The NWP advocated use of the writing process and it became an essential component of whole language classrooms (Butler, 1988; Routman, 1988). Butler felt writers in natural language learning classrooms needed

opportunities to reflect on their message and make revisions before, during and after drafting. Children who used process writing saw themselves as writers because they wrote for real audiences and purposes. Routman voiced her belief that a focus on process was imperative.

Although she considered process important, Routman described guided writing as the "heart of the writing program" (Routman, 1991, p. 66). During guided writing the teacher helped children discover how to express themselves meaningfully. She facilitated and supported the writer with suggestions for improvement. The use of writing conferences allowed the teacher to check for the child's independent understanding of topics introduced during whole class instruction.

Graves' (1983) description of the twin crafts of teaching and writing also concluded that writing conferences were at the heart of the writing program. He noted that the craft of teaching was most clear in the conference. Teachers used conferences to address needed writing skills at the very moment the child required their use. The effect of writing conferences was cumulative as children became independently responsible for skills taught.

Both Turbill and Butler described the writing conference as "a workable way to individualize the teaching/learning of writing" (Turbill, 1983, p.10). Conferences were brief discussions between a child and teacher, which fostered thinking and drew out new ideas by encouraging and questioning. Butler noted that children made quick progress because skills, taught at the time of need, created a more individualized program.

Kawakami, Oshiro, & Farran (1988) turned research in process writing into practice in a kindergarten classroom. The researchers used two activities, morning message and student messages, during their two year study. Additionally, the study included process writing sessions of approximately 35 minutes with five minutes spent in prewriting, 20 minutes in actual writing and 10 minutes in sharing. Children who participated showed growth in individual writing ability. Teachers, however, struggled to provide individual conferences for all children during whole group sessions. Establishing four conference steps helped rectify this difficulty. Each student conference included:

1. Focus on meaning and message of the piece

2. Making a statement about the child's ability to use the writing process
3. Getting additional information from the child on his topic
4. Closing the conference with a positive statement.

The belief that writing was a developmental process requiring each student to be met at his level was the basis for the use of individualized conferencing to improve writing (Bereiter, cited in Best, 1995). Kawakami et al. (1988), responding to the need for a developmental writing program, outlined coaching guidelines to assist children in improving their writing. The four guidelines suggested:

1. Encouraging invented spelling and use of environmental print
2. Copying student oral dictation in a location other than directly on the student's paper
3. Developing a standard for book publication of three labeled pictures
4. Reading both high and low level student writings during sharing sessions.

Calkins (1983), in her research with Donald Graves for the National Institute of Education, found that teachers generally used three types of writing conferences. Content conferences focused on the child's message. The teacher asked questions to clarify meaning and expand on the text. The focus of this type of conference was the child's ability to communicate effectively. Process conferences, the second type, occurred when teachers and students discussed aspects of the writing process itself. Teacher questions centered on the writing strategies the children used and future plans for their piece. Finally, conferences that assisted children in self-evaluation emerged. These conferences challenged the child to separate "good" and "bad" pieces of writing and evaluate his skill as a writer. Calkins found that the use of predictable conference structures and open-ended questions transferred into the students' conferences with each other.

According to Harris, writing conferences should teach children to explore and discover through writing. She indicated that the one-on-one nature of conferencing allowed children to hear teachers talk about writing in general and each child's writing specifically.

Harris cited a number of advocates who consider conferencing a prime method for writing instruction. Perhaps none described their position so succinctly as Charles Cooper when he said,

> We should spend nearly all of our time conferring with individual writers. That seems to be what they need most - supportive response and help with their problems in the particular piece they are working on. The writing process demands it. Discourse theory calls for it. Research on writing supports it. I don't see any way around it (Harris, 1986, p.3).

The use of conferencing was one positive method for supporting individual writers. Interactive writing also assisted young writers. Interactive writing allowed the teacher to "share the pen" with a student as he began to communicate on paper.

As Clay noted, young readers and writers focused on many processes that occurred simultaneously. Initially, young children attended closely to the features of letters. In writing, they worked at constructing their words a letter at a time, attended to spatial relationships, and segmented sounds into words. The integration of these processes was a formidable task for

the child. As part of the Reading Recovery program, at-risk first grade readers participated in interactive writing to enable them to become proficient writers and readers.

During the writing portion of a Reading Recovery lesson the teacher assisted the child in writing a short, one sentence story. After the child composed, the teacher helped him analyze the sounds in words to spell and write each correctly. Reading Recovery teachers supported children by supplying unknown letters, sounds or words and working with the child in the zone of proximal development (Clay, 1993b). The teacher worked from the known, gently nudging the child into making new connections in writing. This approach did not allow for self-reflection since students completed all revision and editing simultaneously, resulting in one published sentence. The current study employed the interactive writing model used in Reading Recovery.

Spelling and Whole Language Programs

As previously noted, spelling instruction was noticeably absent from the lists of whole language components. Understandably, both Gentry and Gillet

(1993) and Routman (1993) reported that teachers were uncomfortable with the level and type of spelling instruction provided.

As part of whole language programs children used invented spellings to represent words they had not learned in every detail. This invention allowed children to put their ideas on paper without interruption. Teachers encouraged children to review their work and edit for misspellings. The use of invented spelling came under criticism from parents concerned about its effectiveness (Levey, 1995).

The research of Charles Read (1971) formed the basis for spelling instruction in whole language classrooms. In his studies of young children's writing, Read showed that a relationship existed between sound categorization and spelling. Read collected 2,517 words from children ages 2.5 to 4 years. The 32 children independently invented their own orthography, which they continued to use until they learned standard spelling at school. Read found consistency and similarities across his sample even though the children were not in contact with each other.

A child typically began to produce invented spellings when he recognized the alphabet and named the letters. Once a child recognized letter names usually spell phones (sounds), he began to apply the principle to words. Some children in the sample produced this type of spelling as early as two years of age.

Read reported that the introduction of standard spelling did not have an immediate impact on a child's invented spelling; however, the type of instructional program influenced changes in students' invented spelling. More traditional programs hastened movement to standard spelling.

Read hypothesized that there was a phonetic basis for the children's invented spellings. In order to prove his hypothesis, Read had to show that the frequency of spellings was greater than what occurred by random chance. In his analysis, children used the vowel e for i in words like ship and sink 23% of the time indicating a much greater level of consistency than that which would occur randomly. This phenomenon and others similar to it indicated that children were indeed categorizing speech sounds in their writing (Read, 1971).

Other researchers substantiated Read's claim that children's invented spellings were consistent (Beers, 1975; Gerritz, 1974). Gerritz supported Read's findings related to the spelling of vowels and Beers found that students progressed from no attempt at spelling to a letter name strategy similar to that found by Read.

Rystrom's (1973-74) research results disagreed with Read's findings on vowels. In a forced vowel test, Rystrom asked children to fill the vowels a, e, and i into blank spaces within a sentence. Results indicated that children arbitrarily assigned vowels to the blanks rather than using a systematic method suggested by Read's research. Read countered Rystrom's results stating that children may have viewed Rystrom's test as a fill-in-the-blank task that did not require analysis of sounds like those required in actual writing (Read, 1971).

Read's research had significant implications for classroom spelling instruction. First, the results suggested the assumption that young children find it easier to learn an orthography that groups together similar speech sounds may be incorrect. Read's research indicated children find an abstract spelling system to be acceptable even when it ignores phonetic

distinctions. Read expressed the relationship of his research to educational practice: "The educational importance of invented spelling and phonetic categorization by children is that we cannot assume that a child must approach reading and writing as an untrained animal approaches a maze - with no prior conception of its structure" (Read, 1971, p. 76).

Henderson built on Read's work by observing how invented spelling manifested in children's writing and spelling at school. Through his research, Henderson found five stages of word knowledge. In the preliterate stage (ages 1 - 7), children scribbled, drew and imitated adult writing. Invented spellings using actual letter names and the use of standard spelling for sight words characterized the letter name stage (ages 5-9). Children in the within word pattern stage (ages 6 - 12) used invented spelling primarily to mark vowels. Youngsters showed invented spelling errors at junctures or in schwa positions during the syllable juncture stage (ages 8-18). The final stage (ages 10 - 100), derivational constancies, included invented spellings for the most commonly misspelled words.

New knowledge in the area of reading signaled movement between the spelling stages. For instance,

children who developed an understanding of the concept of word moved from the preliterate stage to the letter name stage. Henderson also indicated that children must memorize a sample of their reading and writing vocabulary in standard form to learn higher ordered spelling principles (Henderson, 1985).

Unlike some whole language proponents, Henderson did not suggest teaching spelling through writing only. He indicated that children must develop a concept of correct spelling. Henderson noted that "important incidental and informal spelling instruction can and should be carried out in conjunction with writing activities; but these will fail as a primary source of direct spelling study" (Henderson, 1985, p. 89).

Gentry and Gillet (1993) asserted that spelling and whole language are complementary to one another. They suggested that word study was important; but, incidental learning during writing instruction was a powerful tool for gaining spelling knowledge and assessing student progress.

In their book, Teaching Kids to Spell, the authors outlined five stages of invented spelling (Gentry & Gillet, 1993). Spelling in the precommunicative stage

consisted of a series of letters that show no relationship. A child's recognition that letters say sounds characterized the semiphonetic stage. In the third stage, children wrote words using symbols to represent sounds. Transitional spellers recognized that they must spell based on both the sounds of words and how they look. Formal spelling instruction was appropriate in this developmental period. Students moved into the final stage of spelling when they demonstrated knowledge of a large corpus of words.

Gentry and Gillet noted that spelling was a developmental process that followed the aforementioned stages. Spelling proceeded from the simple to the more complex. The authors suggested that a person must synthesize phonetic, etymological, semantic and visual knowledge in a complicated cognitive process to become a conventional speller.

Klesius, Griffith and Zielonka (1991) studied student achievement in spelling as well as reading and writing. Their research compared whole language classrooms with traditional classrooms to determine which method produced the best results. The researchers tested students in three whole language and three traditional classrooms. They found that end of the year

measures showed no significant differences in any of the three academic areas. The authors noted that students who entered the first grade classrooms with high scores in phonological awareness remained stronger at the end of the year. The high phonological awareness children scored significantly better on measures of spelling and decoding than children who had low phonological awareness. Neither program appeared to close gaps between high and low phonologically aware children. In addition, the study showed that phonological awareness taught through direct instruction could be learned indirectly in whole language classrooms.

Cognition and Spelling

Edmund H. Henderson (1981), in his review of Zutell's research on decentration and spelling, suggested that growth in spelling was both developmental and cognitive in nature. Henderson believed that analysis of children's spelling errors might provide evidence of the children's conceptualization of word. The children demonstrated a strong sense of how written language works and tried to create workable forms for words. At first, new principles were overgeneralized until students developed a fuller conceptualization.

Uta Frith (1980) edited one of the most comprehensive collections of research conducted on the cognitive processes in spelling. Frith suggested that cognitive psychologists largely ignored the study of spelling. Cognitive Processes In Spelling was Frith's attempt to answer questions about how both children and adults learned and retained spellings.

Several researchers conducted experiments based on the notion that writing consists of translating graphemic information (visual information from the text), phonetic information (spoken version) and semantic information (meaning of the text). They typically looked upon these information categories as separate processing levels. Waters, Bruck, and Malus-Abramowitz (1988) based a study on this theoretical interpretation of learning to spell. The researchers asked good and poor spelling elementary students in grades 3 to 6 to spell words and nonwords. Each item required the use of specific types of information (phonological, morphological, orthographic, or visual) to arrive at the correct spelling. Children found spellings based on morphological information the most difficult while those based on invariant sound-spelling relationships were easier. By third grade, children

attempted to use all sources of knowledge for spelling. Poor spellers used the same sources of knowledge as good spellers, but had less understanding of this knowledge. Poorer spellers seemed to depend upon visual information more than good spellers.

Research conducted using this type of theoretical orientation produced interesting and valuable information; however, researchers, such as Philip Smith, suggested that it limited the ability to understand the mechanisms in play during translation processes from one type of information to another. Smith supported this view with research on pronunciation of unfamiliar words. Both children and adults went beyond grapheme-phoneme correspondences and used syntactic information and phonemic and graphemic structure of the whole word when spelling. Smith also noted that spelling and reading tapped different linguistic abilities. Spelling required a phonological element that was not present in reading tasks. Smith suggested that modification of the theoretical conceptualization of processes in spelling and reading was necessary as follows:

> The reader or speller is to be conceived of as a multi-level information processor. The levels would be numerous (graphemic, phonetic, low-level

> phonemic, high-level phonemic, morphemic, lexical, syntactic, semantic, etymological, etc..) and any particular process (reading aloud, reading silently, proofreading, spelling, etc.) would utilize possibly different selections of levels, which would interact with one another in the course of the task (Smith, 1980, p. 48-49).

Ehri (1978) also suggested a theory for conducting research on printed word learning. Her theory supported the notion that there must be room to analyze the importance of several skills or experiences in trying to define the word learning process. Ehri conceptualized a child's lexicon of word units that had several different facets: a phonological identity, a syntactic identity and a semantic identity. "This written unit is thought to be incorporated not as a rotely memorized geometrical figure but, rather as a sequence of letters bearing systematic relationships to phonological properties of the word" (Ehri, 1980, p. 313).

Ehri's word identity amalgamation theory denoted the way orthographic identities become established in memory. Children assimilated the printed form of a word to its phonological structure by matching some of the letters to the phonemic segments detected in the word.

Words learned at least partially in this manner became part of lexical memory. Once printed words were part of the lexical memory, they amalgamated with phonological, syntactic and semantic identities. These orthographic images, once combined, formed a single representational unit in lexical memory.

Ehri indicated that orthographic images perform important cognitive functions. Ensuring accurate production of printed words was one of their primary jobs. Orthographic images also assisted writers in distinguishing which spelling matched each meaning in the case of homonyms, contributed to verbal memory and aided in the pronunciation of words. Research findings indicated that orthographic images in memory assisted the child in producing conventionally spelled words rather than words based primarily on phonetics.

Study of spelling processes with dyslexics by Seymour and Porpodas (1980) indicated that students needed two types of knowledge to understand spelling. First, a person must understand the grapheme-phoneme correspondence required; and second, the lexical-morphemic knowledge needed to read irregular words (ex. eye, ewe). They suggested this dual nature of spelling implies that two processing systems (grapheme-phoneme

translation channel and lexical-semantic channel) must be present for skilled reading to occur. The authors found their subjects possessed the capability for phoneme-grapheme translation; however, a lexical channel for spelling production also needed to be in place for the subjects to be successful spellers.

Seymour and Porpodas explained this channel in the form of a logogen system, as discussed by Morton (1980), "through which currently active phonological, semantic or graphemic codes may access word-specific spelling information" (Seymour & Porpodas, 1980, p. 461). The authors concluded that spelling development required the establishment of permanent storage for word-specific information. Dyslexics could recognize or read words that they were unable to spell, suggesting that patterns recognized in reading were not in permanent storage for writing.

Phonetic misspellings, in Uta Frith's study of unexpected spelling errors, implied the existence of three stages of spelling process. Three groups of twelve year olds took reading and spelling tests. Good readers/good spellers and good readers/poor spellers made greater numbers of phonetic spelling errors while poor readers/poor spellers made approximately the same

number of phonetic and non-phonetic errors. Results indicated the analysis of speech into approximate phonemes was the first process in spelling. In the second process, subjects converted phonemes into graphemes using analogies or rules. The third process required the speller to select the conventionally correct graphemes from all the phonetically correct possibilities. Subjects made phonetic misspellings in the last portion of the spelling process.

Marsh, Friedman, Welch and Desberg (1980) discussed processing strategies for spelling. The authors defined a strategy as an "active change in processing modes to accommodate task demands" (Marsh et al., 1980, p. 340). As part of their study the researchers conducted a task analysis of reading and spelling. Substitution strategies in reading, where students substitute a known word for an unknown word, were counterproductive to learning to spell. Sequential decoding skills in reading assisted a child in developing a visual representation of words in his memory. These skills as well as the hierarchical decoding strategy based on conditional rules (ex. CVCe when e marks a long vowel) were helpful in spelling. Analogy strategies, relating

one word to a known word, and phonemic strategies were also useful in spelling.

The researchers found a developmental shift between second and fifth grades in both spelling and reading. They hypothesized second graders had difficulty using the analogy strategy due to an inadequate visual store of known words. Fifth graders increasingly used this strategy.

Barron (1980) also discussed the use of the visual-orthographic and phonological strategies as they related to spelling. Barron indicated people retrieved information from their personal internal lexicon using one of these two methods. In his research, Barron asked twenty-four good readers and twenty-four poor readers in grades 4 - 6 to spell twenty regular and twenty irregular words. Research results indicated that poor and good readers differed in the strategies they employed for spelling. Poor readers tended to rely solely on a phonological strategy more frequently than good readers. The good readers were more likely to use both a visual-orthographic and phonological strategy. Barron explained these results by suggesting that poor readers may not have an adequate number of visual-orthographic entries in their lexicon. He also

suggested that the use of visual-orthographic information might influence spelling only indirectly as part of a checking process where students compare rules generated spelling with the visual orthographic information from their lexicon.

Bryant and Bradley (1980) suggested that a distinction exists between learning to read and learning to spell. They proposed that reading is dependent on visual chunks, whereas spelling is dependent on phonological segments. The researchers asked children to read and spell a list of 18 words on two separate occasions. Their results indicated that children use two strategies, phonological and visual. The students tended to use one strategy primarily for spelling and the other for reading. They also used a contextual analysis strategy to help guess words as they read.

The importance of phonological information in spelling was evident in many of the aforementioned studies. Its use required auditory processing ability. Flower (1965) indicated that children with similar experiential background and intelligence could have varying levels of auditory proficiency. Flowers attributed these variances to neurophysiological readiness and maturation.

Stage and Wagner (1992) also noted the effect maturation had on the phonological and orthographic knowledge of children grades kindergarten to third. The researchers administered tests of spelling, phonological awareness, working memory and general cognitive ability. Stage and Wagner used correlational analyses to examine interrelations among the variables and developmental differences. Results indicated that after separating out general cognitive ability phonological awareness related to spelling at all levels. A developmental relationship existed between working memory and spelling with the relationship lessening as children became older. Limited working memory had a negative influence on young children's spelling performance.

Phonemic Awareness

Definition and Development. The use of process writing and the focus on individual writing development assisted young students in the development of phonemic awareness. Phonemic awareness, "the knowledge that the spoken word can be broken down into smaller units (ie. its phonemes)" was a highly critical factor in determining reading success (Juel, Griffith, Gough, 1986, p. 144). Adams stated, "Faced with an alphabetic script, the child's level of phonemic awareness on

entering school may indeed be the single most powerful determinant of the success she or he will experience in learning to read" (Adams, 1990a, p. 54).

Phonemic analysis was a powerful predictor of literacy acquisition. In their study of 129 first graders in Austin, Texas, Juel, Griffith, and Gough (1986) found that IQ, ethnicity and entering oral language skills contributed to phonemic awareness. Listening comprehension and phonemic awareness strongly influenced year end performance in spelling, word recognition, writing and reading comprehension. These results indicated the need for oral phonemic awareness training for low phonemically aware first grade students.

While there was agreement that phonemic awareness and reading were related, the relationship was not clear. In a study of first grade students Perfetti, Beck, Bell and Hughes (1987) determined that learning to read and phonemic awareness were reciprocal in nature. They suggested that growth in reading increased ability in phoneme segmentation and phoneme deletion.

An elementary knowledge of phonemic awareness was required to begin reading instruction.

More recently, investigators questioned whether a causal relationship existed between phonological processing and reading success. Was increased skill in phonological processing impacting reading ability or was learning to read changing phonological sensitivity?

McGuinness, McGuinness and Donohue (1995) developed a predictive reading battery using 94 first grade students. The Lindamood Auditory Conceptualization Test (LAC) of phonological awareness provided the best predictive measure in the battery for reading word recognition and decoding skill. The battery was administered to a group of 44 students aged 5.10 - 7.9 years enrolled in two private schools. Students in two experimental groups received training in a structured phonological reading program. The control group who participated in a whole language plus phonics program performed at a lower level on reading real and nonsense words. The researchers noted that students in the experimental groups made significant gains in word identification and word attack skills over the control group. The LAC test was the strongest predictor of reading success regardless of the training group.

Children in all three groups showed growth in phonological awareness with no significant difference

between groups. The investigators concluded that reading growth could not be attributed to differences in the development of phonological awareness. McGuinness, McGuinness and Donohue concluded "that phonological processing is a necessary but not sufficient cause of learning to read. Training in phonological awareness must be connected to knowledge of the alphabet principle and accurate phoneme-grapheme correspondences..." (McGuinness, McGuinness & Donohue, 1995, p. 850). Students who did not make this connection might not engage their phonological processing skill and use decoding; instead, they would rely on visual strategies that were easier to use and provided more immediate success. This phenomenon was evident in the results of control group students who advanced at a normal rate on the word identification test but not on the word attack test.

Study conclusions indicated instruction in the relationship between phonemes and graphemes was essential for developing decoding skills. Additionally, the authors rejected the use of a unidirectional causal model for understanding the reading process. Their research showed that phonological processing predicted

reading ability but was in turn affected by learning to read.

Hoien, Lundberg, Stanovich, and Bjaalid (1995) studied the relationships between various phonological tasks. They indicated students might have various levels of phonological sensitivity, ranging on a continuum from shallow sensitivity to deep sensitivity. Deep sensitivity included sensitivity to individual phonemes. Another possibility raised by Hoien et al., based on Bentin's work, categorized phonological awareness into two qualitatively different types: 1) early phonological awareness indicated by sensitivity to rhyme and syllable and 2) phonemic awareness indicated by sensitivity to phonemes.

Winsor and Pearson (1992) noted that a great deal of literature in the field considered phonemic awareness to include three tasks. Blending required a student to create a word by linking phonemes together. Segmentation was the opposite of blending where students separated the individual phonemes in a word. Deletion, the final task, required a student to omit phonemes from the word (eg. /dog/ without the /d/ is /og/).

Adams (1990b) broke phonemic awareness down into five levels. Initially children heard rhymes and

alliteration and then performed oddity tasks where they compare and contrast words listening for rhyme and alliteration. The third level asked students to blend and separate syllables. In level four children performed phonemic segmentation activities including counting each phoneme in a word. Finally students performed phoneme manipulation activities such as adding and deleting phonemes.

Swank (1996) further organized the hierarchy of phonemic awareness skills. Introduction of early stages of phonemic awareness (rhyme judgment, rhyme play and rhyme production) fell under preschool and early kindergarten instruction. Beginning in mid-kindergarten teachers focused on syllable awareness and simple phonemic awareness (identification of speech sounds). Advanced phonemic awareness including counting/segmenting phonemes, blending and deleting phonemes was addressed in mid to later kindergarten. Early first grade instruction revolved around similarities and differences in sounds, mapping sounds to letter symbols, introducing and mapping sounds to vowels and manipulating sound-symbol combinations.

Hoien, et al. (1995) conducted two studies to test for the relationship between phonological tasks. In the

first study, 128 Norwegian preschool children aged 6 years 5 months to 7 years 5 months completed six types of phonological awareness tests. Results of the principal component analysis indicated three clear factors; rhyme, syllable and phoneme awareness made up the component parts of phonological awareness.

The second study of 1509 first grade children attempted to replicate the factor structure with older students. Hoein et al. conducted an analysis of differences between the factors and their ability to predict reading skill. The large sample size provided highly significant intercorrelations between the six phonological awareness tests. Since the children participated in formal reading instruction it was also possible to assess their word reading ability.

Second study results replicated the three separable components of syllable, rhyme and phonemic awareness. All three components predicted early word decoding ability with the syllabic factor being the least predictive. Phonemic awareness was the best predictor of early reading acquisition. The sample size permitted examination of the power of different types of phoneme awareness at predicting early reading acquisition. The subtests of initial-phoneme matching and final-phoneme

matching were the strongest predictors based on the multiple regression analysis.

In a paper presented at the 1987 Annual Meeting of the American Educational Research Association, Rebecca Treiman suggested changes in reading instruction based on levels of phonological awareness. Treiman designed several tasks to assess whether children analyzed words by intrasyllabic units as well as syllabic units and phonemes. She tested two types of intrasyllabic units, onset and rime.

Treiman presented pairs of words to 56 kindergarten children and asked them to tell if the beginnings (onset) and endings (rime) were the same. Onset items included words with consonant-consonant onsets (ex. plank, plea) as well as single phoneme onsets (ex. pacts, peel). The researcher used rime items with similar vowel-consonant patterns (ex. spit, wit). The children performed the same type task with syllabic unit pairs (ex. raccoon, cocoon and butter, button) and phoneme pairs (ex. plank, prove and spit, flat).

Results indicated that 90% of kindergarten students heard similarities at the syllabic level by reaching the criterion of six items correct, 70% heard similarities

at the onset/rime level and 40% in the phoneme condition. This pattern of achievement was also consistent when Treiman looked at the number of students who completed the tasks with no errors. Analysis of errors showed a significant difference for mean number of errors at the intrasyllabic condition (6.8 of 40 items) and the phoneme condition (13.9 of 40 items). The error difference between the syllable condition (4.1) and the intrasyllabic condition (6.8) was not statistically significant. The author attributed these results to the small sample size; however, the results may have occurred because students found the syllabic and intrasyllabic tasks similar.

Based on these results, Treiman studied the onset units further with a group of 20 first grade students. The students made more errors in finding the initial phoneme when the onset units were similar consonant blends (ex. plan, prow) than when the onset consisted of a single consonant (ex. pacts, peel).

These findings suggested that children were better able to analyze words in a hierarchical fashion than with a linear approach (See Figure 1).

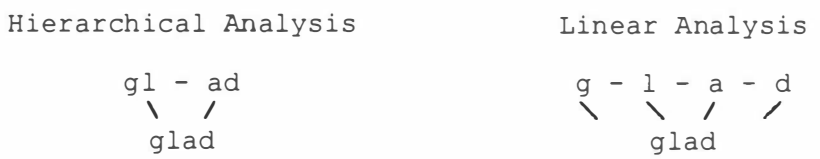

Figure 1. Word analysis methods

Phonemic Awareness and Instructional Programs. Treiman's results had inherent instructional implications for classroom teachers. Phonics instruction typically proceeded from syllabic analysis to phonemic analysis. Study results suggested that students develop phonological awareness first at the syllabic level, then at the intrasyllabic level and finally at the phonemic level. Instead of whole word approaches and letter by letter phonetic analysis approaches, beginning reading instruction might stress spelling and sounds at the intrasyllabic level instead. This process was similar to the study of word families and the make and break portion of Reading Recovery lessons (Clay, 1993b).

Further suggestion for the best type of reading instructional program resulted from Cunningham's (1990) study of kindergarten and first grade students. Three

groups were formed following matching. The two experimental groups received training in segmenting and blending sounds. The only difference between the two experimental groups was a focus on the benefits and application of the phonemic awareness skills. The first group learned segmenting and blending in a skill and drill approach whereas the second group spent time discussing benefits of learning phonemic awareness. The control group received lessons on story elements.

Results indicated a significant increase in performance for students who received phonemic awareness instruction. Cunningham confirmed the need for phonemic awareness instruction in the early grades and advised teaching phonemic awareness in a meaningful context.

Instructional implications of Griffith and Klesius' (1992) study of kindergarten students pointed to the inclusion of paper and pencil activities as a means of improving phonemic awareness. The relationship between phonemic awareness and letter name knowledge explored in this study indicated that students rarely perform well on phonemic awareness measures without letter name knowledge. Further, changes in letter name knowledge were followed by changes in phonemic awareness. Students' phonemic awareness and letter name knowledge

explained 36 % of the variance in implicit understanding of the alphabetic principle.

Spelling was used to measure explicit understanding of the alphabetic principle. Fifty-seven percent of the variance in spelling scores was accounted for by phonemic awareness and letter name knowledge. Students who were low in both letter name knowledge and phonemic awareness produced the most deviant spellings. Students high in one area and low in another performed almost as poorly. Results supported the need for both phonemic awareness and letter name knowledge to produce successful spelling.

Although past study indicated phonemic awareness was a strong predictor of reading success, it was not a strong predictor of a students acquisition of orthographic information. Phonemic awareness and letter name knowledge together only predicted 9 % of the variance in acquiring orthographic knowledge. Kindergarten students understood that numbers and mock letters were not part of real words however; they did not understand the role vowels played within words. Knowledge of vowels in spelling was not applied to making decisions about words. The research supported Clay's (1985) contention that students practice many

reading skills when they write. When children map spoken language onto written language they improve their ability to segment sounds in words.

Griffith and Klesius (1990) also assessed the effect phonemic awareness ability and reading instructional approach had on first grade students' development of spelling and decoding skills. They pretested students in one whole language classroom and one traditional basal instruction classroom on six phonemic awareness tasks (phonemic segmentation, blending, deletion of first phoneme, deletion of last phoneme, substitution of first phoneme and substitution of last phoneme) as part of the GKR Phonemic Awareness test. The researchers classified students with the six highest pretest scores as high phonemic awareness students and those six students with the lowest pretest scores as low phonemic awareness students.

Results indicated that regardless of instructional approach high phonemic awareness children performed better than low phonemic awareness children. Further analysis of effect sizes showed that high phonemic awareness children had an advantage in whole language classrooms while low phonemic awareness children performed better in traditional classrooms.

Researchers found students in traditional classrooms became more accurate spellers and whole language students became more fluent writers.

Winsor (1990) conducted a qualitative study to determine whether at-risk children increased phonemic awareness knowledge in holistic language arts programs. Winsor observed 20 children for 10 days in four classrooms. Classroom teachers concurred with observation records. Each child completed ten measures of phonemic awareness in October and April.

The researcher noted that choral and individual reading of repeated text and the use of invented spelling in writing was linked to improvement in tasks of phonemic awareness. Results indicated that students learned phonemic awareness skills in holistic instructional programs, but this type of instruction was not enough for all children. Winsor suggested that additional intervention may be needed by some students.

Phonemic Awareness Training. Attempts at training students in phonemic awareness proved successful in a number of cases. French and Feng (1992) conducted an evaluation of 24 kindergarten students participating in a phonemic awareness training program in a whole

language instructional program. Researchers asked students to push disks into boxes to represent each phoneme in a target word. As the year progressed students began to use letters to represent the sounds they heard and finally wrote a sentence the teacher dictated using the target word. Dictated sentences used only known words.

Study results should be considered carefully. French and Feng concluded that growth from pretest in November to posttest in April indicated a need for phoneme awareness training in all kindergarten programs. This conclusion may be erroneous since the researchers did not use a control group in their design. The effects of normal maturation could not be ruled out. Additionally, French and Feng described varied ways in which teachers addressed phonemic awareness within the classroom which confounded the measurement of the treatment. One could not clearly ascertain which aspect of the program actually contributed to growth in phonemic awareness.

Torgesen, Morgan and Davis (1992) studied the effects of two types of oral phonological awareness training over 7-8 weeks. Forty-eight kindergarten

sessions per week. The first treatment group received instruction in both segmenting and blending phonological tasks. The second group received only blending instruction and the control group received no phonological awareness training. The researchers expressed a concern that the extra week of instruction for the first treatment group might pose a threat to the results. They felt the threat was limited because the first treatment group completed fewer activities than the second group and had difficulty with the beginning training activities. Students who received both types of phonological awareness training as part of the first treatment group showed a positive effect for word learning; therefore, indicating the need for both blending and segmenting instruction.

Uhry and Shepherd (1990) showed that instruction in segmentation/spelling training resulted in early gains in using the alphabetic principle for 28 beginning first and second grade readers. Participants trained in two 20 minute periods each week for six and a half months. Control group students received instruction in reading letters, words and text while the treatment group worked with segmentation/spelling activities. Students segmented words into their individual phonemes using

blocks to represent each sound. In November, the researchers added colored blocks, red for vowels and blue for consonants, to the treatment. In January, they added stick-ons with printed letters to the blocks. Following work with the blocks the students used computers to segment words in each lesson. Control group students read a list of words presented in the lesson until they demonstrated mastery. The lesson ended with the use of sight word acquisition computer games. Experimental subjects performed significantly better on measures of reading nonsense words, reading real words and oral passages. Results for silent comprehension were not significant. Uhry and Shepherd suggested that "spelling may affect reading through the mapping of sounds onto letters" (Uhry & Shepherd, 1990, p. 2).

Ball and Blachman (1991) showed that phonemic awareness training helped kindergarten children improve in both reading and spelling. Ninety students from three urban public schools received phonemic segmentation instruction in 20 minute sessions four times a week for seven weeks. Ball and Blachman used a procedure adapted from Elkonin analysis for the phonemic segmentation instruction. Students participated in a say-it and

move-it activity designed to "make explicit the role of segmentation in an alphabetic system" (Ball & Blachman, 1991, p. 55). After an instructor said a 1,2, or 3 phoneme item, students repeated the item and then moved disks from the top half of a letter sized card to the bottom half to represent each phoneme. As the children moved the disks, they simultaneously said each individual phoneme aloud. Over the course of treatment, the training progressed from 1 to 2 and finally, 3 phoneme items. After three weeks of training, subjects used tiles with printed letters, mastered in the letter-name and letter-sound training portion, in sessions twice weekly as part of the say-it and move-it training. Trainers provided enough blank tiles so a child could segment an item using the appropriate letter tile or all blank tiles.

Study results indicated that students who received segmentation training and letter-name and letter-sound instruction had significantly better spelling ability than students who received no training or only letter-name letter-sound instruction. Ball and Blachman suggested that students who were phonemically aware were better able to crack the alphabetic code necessary for spelling success.

Tangel and Blachman (1992) found that kindergarten students selected from a larger phonemic awareness study, who were members of the say-it and move-it treatment group, produced developmentally superior invented spellings when compared with the control group. The treatment group participated in the same say-it and move-it activity as the Ball and Blachman study as well as segmentation, letter name and letter sound activities. Trained classroom teachers conducted treatment during regular class time as opposed to outside instructors as in the previous study.

The researchers developed a seven point scale for assessing students' invented spellings following treatment. Tangel and Blachman determined the scoring system's reliability by calculating percentage of agreement between raters (93%) and the Pearson correlation between the scores of the two raters (r=.98). They administered the developmental spelling test (DST) as a post-test only measure. The researchers noted "there were no pretest measure differences on beginning spelling ability - specifically, phoneme segmentation and letter name and sound knowledge" (Tangel & Blachman, 1991, p.243). Results of the DST indicated the treatment group outscored the control

group in spelling sophistication on every word. The mean of the DST scores for the treatment group (M=2.32, SD= 1.37) was significantly higher than the mean of the DST scores for the control group (M=1.20, SD=.997). Treatment children had a larger number of phonemes represented and a more sophisticated sequencing of both phonemes and orthographic features.

Alfred Lie also assessed spelling by administering two types of phonemic awareness training to Norwegian first graders in a longitudinal study. During the fall term, Lie divided ten classes into three groups (sequential phoneme segmentation, phoneme isolation and control) using "deliberate sampling for heterogeneity" (Lie, 1991, p. 239). The study assessed prereading skills at the beginning of grade 1. Daily treatment for the groups occurred in 10-15 minute exercises. Initial scripted lessons on language and sounds in words were the same for both treatment groups. Children in the isolation group used stories, pictures and topical word lists to learn sounds in initial, final and medial positions. The sequential group used the same materials to learn to identify the initial phoneme in a word, then the second phoneme, third phoneme, etc. The researcher administered measures of metaphonological development

individually to the 54 children before training, midway through training and at the end of treatment. Lie assessed reading and spelling skills at the end of first and second grade.

Results from a 3X3X2 ANCOVA showed the sequential training group performed significantly higher than the control group at the end of first grade in both reading and spelling. There were also significant gain effects for intelligence on reading and on spelling. Of significance was the intelligence on group interaction for reading ($F(2,137) = 6.96$, $p < .05$) and for spelling ($F(4, 137) = 2.86$, $p < .05$) indicating that the effect of treatment was greatest for students with low intelligence. Lie concluded that evidence suggested "a systematic training program for stimulating skills in word analysis in first grade children facilitates both reading and spelling acquisition" (Lie, 1991, p.247). Results supported the notion that sequential analysis training was a more effective manner of teaching word analysis than positional analysis training.

In Griffith's study of the effects of phonemic awareness on spelling 96 first graders and 87 third graders completed the GKR Test of Phonemic Awareness and a spelling test of 40 words. Scores indicated that

phonemic awareness and word specific information accounted for 54% of the variance in spelling at the first grade level and 70% of variance at the third grade level. Phonemic awareness had a significant effect on spelling at the first grade level, accounting for .56 standard deviation increase. This effect lessened at the third grade level, accounting for only .27 standard deviation increase. Third grade students relied more heavily on the memorized information about a word's particular spelling, or word specific information.

Scattergrams showing the relationship between phonemic awareness and word-specific information suggested that phonemic awareness may provide a foundation for word-specific knowledge. The scattergrams indicated that children could be high in phonemic awareness and low in word-specific information, but were generally not low in phonemic awareness and high in word-specific information.

Qualitative analysis of individual performance on words showed that children with high phonemic awareness were better prepared for internal analysis of words. They completely segmented words in spelling and attended to individual phonemes in words when reading.

Participation in phonemic awareness training activities improved spelling achievement in several studies (Ball & Blachman, 1991; French & Feng, 1992; Lie, 1991; Tangel & Blachman, 1992; Torgensen, Morgan & Davis, 1992; Uhry & Shepherd, 1990). Clay's Reading Recovery program, which used Elkonin analysis as a means of working with phonemes, also showed increases in students' spelling achievement (Clay, 1979).

The Reading Recovery Program

Reading Recovery, a one-on-one intervention strategy for first grade at-risk readers, based on the research of Marie Clay, began in the mid-1960's. From her observations of successful readers, Clay designed techniques for diagnosing early reading difficulties and an instructional program for overcoming these difficulties (Clay, 1979). Although the Reading Recovery program shared the basic tenets of whole language programs, Clay indicated that Reading Recovery differed from whole language and phonics programs.

> It [Reading Recovery] differs from most whole language programs in recognizing the need for temporary instructional detours in which the child's attention is called to particular cues

> available in speech or print. It differs from phonics by conceptualizing phonological awareness as an outcome of reading and writing rather than as their prerequisites and in developing children's awareness of sounds in oral language rather than teaching letter/sound relationships (Clay, in press, p. 21).

Clay also alleged that Reading Recovery differed from both programs because of the use of frequent observation and recording of student literacy behavior; however, whole language proponents required the use of student observation and anecdotal records for teacher decision making in natural language learning programs (Routman, 1991).

In 1978, Clay tested her Reading Recovery procedures in New Zealand. One hundred twenty-two children received individualized instruction using the Reading Recovery procedures from experienced teachers trained in the method during the school year. Children participated in the program based on the scores they obtained on the text reading measure. Each teacher selected the lowest scorers in her school for instruction; therefore, children in school A may have been weaker than children from school B.

Prior to instruction, children took the Reading Recovery diagnostic survey which included tests in text reading, reading vocabulary, concepts about print, letter identification, writing vocabulary and a dictated sentence to measure their ability to hear sounds in words. The field trial research compared initial and final diagnostic test results showing significant growth for successfully discontinued students. The results also indicated that unsuccessful children dropped from the program made progress but did not reach the average level of their classes. Clay concluded that "the pupils who received individual tuition [instruction] made gains which equaled or exceeded the gain scores made by their classmates who showed initially the higher achievement" (Clay, 1979, p.91).

Iversen and Tunmer (1993) criticized Clay's initial test results in their study to determine whether the use of systematic instruction in phonological recoding skills increased effectiveness in Reading Recovery. They suggested that Clay's results were in error because mean pre-test scores of the control group were higher than those of the treatment group. The use of gain scores required an assumption that a linear relationship existed between the amount of instruction and reading

performance. Glynn (1989) showed that text level increase was greater at lower levels than higher levels for any given amount of instruction, thus indicating a nonlinear relationship.

Iversen and Tunmer criticized Clay's view of skilled reading, stating that her view, "which was developed by Goodman (1967) and Smith (1978) has been rejected by the scientific community" (Iversen & Tunmer, 1993, p. 113). They supported the notion that reading was not a psycholinguistic guessing game and did not consist of a sampling of text features.

In their study, Iversen and Tunmer modified the Reading Recovery program to make children aware that words often share spelling patterns when they have sounds in common. The researchers asked students to make and break and build new words using magnetic letters. The standard Reading Recovery group and modified Reading Recovery group performed at similar levels at discontinuation and both groups were stronger than average first graders. Both Reading Recovery groups performed significantly better than the classroom control group on measures of phonemic awareness. The authors attributed this finding to the use of Elkonin analysis in both treatments.

The most significant finding of Iversen and Tunmer's study was the difference in the mean number of lessons required for discontinuation. The standard Reading Recovery group mean was 57.31 lessons (SD = 11.22) and the modified group mean was 41.75 lessons (SD = 10.62). The highly significant difference in means ($t(62) = 5.70$, $p < .001$) indicated that the modified program was 37% more efficient than the standard program. "These results provid[ed] strong support for the hypothesis that children with reading problems will be remediated much more quickly if they receive systematic instruction that is designed to make them aware of the interrelatedness of sounds and visual patterns shared by different words" (Iversen & Tunmer, 1993, p. 120). The researchers suggested that improvement in the Reading Recovery program would occur if teachers introduced phonological awareness at the beginning of the Reading Recovery program rather than after the first ten observational lessons.

In 1979, Clay conducted a follow-up study on students from the original comparison groups. Results indicated that although the discontinued group had low initial mean test scores, its final and follow-up scores were within one standard deviation of the control

group's final and follow-up scores. It was evident that satisfactory gains continued for at least one year after tutoring (Clay, 1985). Initial success of the field trial and follow-up studies led New Zealand to adopt Reading Recovery as its national reading intervention strategy in the early 1980's (National Diffusion Network, 1991).

Reading Recovery research conducted under contract to the New Zealand Department of Education by Glynn et al., used text level to compare student achievement gains. The research data showed that at the final checkpoint; the target children (Reading Recovery students) made a mean gain of 14.5 levels versus a gain of 12.8 levels for the comparison group. The elimination of certain pairs of children due to inability to test or experience with the Reading Recovery program before scheduled test dates might confound these results. As previously stated, text level results showed greatest increases with children who entered the program at the lowest levels.

Glynn et al. (1989) also administered a cloze test of language facility to examine evidence of differential progress between target and comparison children. They

found no evidence that participation in the program was beneficial in terms of performance.

The New South Wales (NSW) Department of School Education commissioned Center et al. (1992) to conduct an empirical evaluation of the Reading Recovery program in 1990. After fifteen weeks of intervention, the Australian Reading Recovery students performed better than their control group counterparts on Clay's battery of tests, which measured reading and writing words in context.

Because the researchers felt that the sole use of the Clay battery to measure program success was a weakness of previous studies, they developed the Macquarie Battery of Tests. The battery included: Neale Analysis of Reading Ability (Revised), Waddington Diagnostic Spelling Test, Passage Reading Test, Word Attack Skills Test, Phonemic Awareness Test and the Syntactic Awareness (Cloze) Test. Reading Recovery students outperformed their counterparts on each of these measures except for the two metalinguistic measures of Phonemic Awareness and Cloze. Assessment after thirty weeks indicated that Reading Recovery children maintained their superiority on the Clay Battery and the Macquarie Battery, but no significant

difference remained between the groups on each of the metalinguistic tests (Phonemic Awareness, Expressive Word Attack Skills and the Cloze test) (Center et al., 1992).

The researchers concluded that Elkonin analysis contributed to the students' success on the spelling measure and addressed phonological awareness in spelling. Center et al. noted Reading Recovery may not provide enough instruction in the metalinguistic skills of phonemic and syntactic awareness and phonological recoding for students to acquire skill in these processes. The authors recommended additional investigation before fully implementing Reading Recovery in New South Wales.

A follow-up study conducted by Wheldall et al. (1992) showed first intake Reading Recovery students continued to outperform low progress comparison first graders a year after initial instruction. New South Wales Reading Recovery students scored higher in all areas (reading, word attack, spelling, comprehension, book level, word reading) except phonemic awareness. The follow-up study also showed children who received instruction in the second intake group did not perform significantly different from the low progress students

who had no intervention. The researchers concluded the NSW Reading Recovery program was successful for 34% of first intake students and only 8% of the second intake group. Further discussion of NSW Reading Recovery programs by Center et al. (1995) indicated that 30% of students considered fully recovered may have improved without any exposure to the Reading Recovery program. Due to these results the researchers recommended NSW consider exploring more effective and cost-effective approaches to the prevention of early reading failure.

The use of Reading Recovery in the United States began in 1984 as a result of interest shown by Charlotte Huck of The Ohio State University. Dr. Huck and several colleagues brought Marie Clay to Columbus to train teachers and teacher leaders for the state of Ohio. The Ohio General Assembly, after seeing the program in progress, funded the statewide implementation of Reading Recovery in 1985-86. Since that time Reading Recovery expanded through the National Diffusion Network to include program sites throughout the United States and District of Columbia. Six states, Texas, Oregon, New York, Illinois, South Carolina and Virginia initiated teacher-leader training programs by 1991 (National Diffusion Network, 1991).

Longitudinal research conducted by the Ohio State Reading Recovery program indicated 73.5% of Reading Recovery students "successfully discontinued" the program in 1985-86. This rate increased to 88% over the first five years of implementation. First year (1985-86) test results showed Reading Recovery students, whether successfully or unsuccessfully discontinued, made greater gains than comparison children on Reading Vocabulary, Reading Comprehension and Total Reading combined score as measured by the Comprehensive Test of Basic Skills (Pinnell, 1988). Second and third year follow-up testing indicated that the group of Reading Recovery students maintained their advantage through the third grade year, most without further intervention (National Diffusion Network, 1991).

Hiebert (1994) reviewed several studies on the effects of Reading Recovery at three training sites across the United States to determine Reading Recovery's ability for "changing literacy profiles of age cohorts" and assessed its cost-effectiveness (Hiebert, 1994, p. 15). Hiebert noted discontinuation rates did not address the actual number of students able to read at the first grade level since students discontinued the program upon reaching the *class's* average reading level.

Analysis of cost effectiveness found that Reading Recovery tutors were not working with the number of tutees (16 per FTE) outlined by the program. This information, coupled with attrition from the program due to student mobility, placement in special education and participation in incomplete programs suggested that this one-on-one intervention was less cost-effective than originally thought.

Hiebert, concerned about the maintenance of reading gains, indicated that by fourth grade only 5.5% of the age cohort would be able to read text at the average school level. Hiebert, as well as Center, et al. (1995) criticized Reading Recovery programs in lower income schools because they did not provide a method for assisting colleagues in changing classroom instruction. Center et al. found Reading Recovery operated independently of the school's organization structure.

Hiebert also noted that lower income schools had lower discontinuation results and lower text reading levels. Reading Recovery proponents suggested that results would improve once school systems achieved full coverage. Hiebert proposed that full coverage was not financially feasible, noting California, would need 6,150 FTE to assist 15% of the first grade age cohort

(444,346 students in 1993-94). Hiebert asked why the five elements of effective reading instruction provided in Reading Recovery tutoring (deliberate instruction, high expectations including setting and reviewing goals, repeated reading of text and experimenting with letter-sound correspondences through writing, and phonemic awareness) were not found in all Chapter I programs.

Pinnell, Deford, Lyons and Ecke (1994) found Reading Recovery was a stronger program than three other types of intervention for at-risk children. In their study, the researchers compared children in five instructional settings. Teachers conducted the first program, Reading Recovery (RR), according to normal procedure. At-risk students participated in two other individualized programs, Reading Success (RS) and the Direct Instructional Skills Plan (DISP).

Reading Success (RS) followed the same instructional plan as Reading Recovery but the teachers did not participate in the year long staff development program required of Reading Recovery teachers. Direct Instructional Skills Plan (DISP) children learned to decode and played word games. The fourth instructional setting, Reading/Writing Group (RWG) taught by trained Reading Recovery teachers followed Reading Recovery

procedures and used a small group format. The final group (control) participated in activities that focused on decoding skills and knowledge of a core group of words. Students used basal readers, worksheets and computers as part of this control group. The comparison group (control group) used current Chapter I programs where teachers followed normal procedures with no additional staff development.

Pinnell et al. measured student achievement at the 40 sites using three dictation tasks, text reading level, the Mason Early Reading Test, the Woodcock Reading Mastery Test - Revised and the Gates-MacGinitie Reading Test. The researchers conducted pretesting in October of Year I and post-testing in February after the conclusion of the tutorial programs. The authors conducted follow-up assessment at the end of the school year using the Gates-Maginitie and again in the fall of Year II using the third dictation task and text reading. Analysis of results indicated that Reading Recovery was the only program that showed significant effects on all four measures at the end of treatment and on text level reading the following fall.

Pinnell et al. summarized the results as showing that individual tutoring like that provided in RS and

DISP was not sufficient for improving reading skill. They also suggested that the RR training made a difference in program outcome because RR students outperformed students who participated in the same program (RS) with teachers who did not have the year long training. The RWG had the second strongest program results considering sustained effects thus indicating that teachers with RR training performed well but the small group format weakened results.

Nonetheless, researchers from New South Wales, Australia (1992) and Rasinski (1995) continued to criticize Reading Recovery pointing out flawed research designs as a hindrance to understanding the success of the program. Center et al. (1992) cited outcome measurement and methodological problems with previous Reading Recovery studies.

Rasinski (1995) also criticized the methodological weaknesses of a comparison study of Reading Recovery conducted by Ohio State University. Rasinski, following an in depth critique of the study's design, found that Reading Recovery teachers had the benefit of more experience, more hours of training and continued staff development over the teachers of the comparison groups. In an analysis of time in instruction, Reading Recovery

students received 603 minutes more instruction than the control group, and 537 minutes more than the RS group. Rasinski's third criticism stemmed from actual lesson time spent in reading, writing and instruction. Reading Recovery lessons had only 6 seconds of non-instructional activities; whereas, 336 seconds of non-instructional activities were evident in control group lessons and 489 seconds existed in the Reading/Writing group lessons. Finally, Rasinski discussed the issue of cost-effectiveness and questioned whether "additional gains made by the one RR student more than outweigh the less robust gains made by the several group-treatment students" (Rasinski, 1995, p. 269). Rasinski suggested other factors present in the study contributed to the apparent success of the Reading Recovery program and deserved consideration.

Although Ohio State University Reading Recovery proponents staunchly defended their research from attacks, concerns over the program's true success still existed. Ohio State Reading Recovery rebutted Heibert's assertion that the program did little to affect the age cohort. The focus of Reading Recovery according to Ohio State University was to reduce the number of individual children having difficulty learning to read not affect

the age cohort. Reading Recovery did not "deal in estimates from group data; [they] record[ed] the proportion of individuals who meet the tough exit criteria" (Pinnell, Lyons, Jones, 1995, p. 18). These assertions by Ohio State appeared to be contradictory to Clay's (1979) original program tenets which indicated that Reading Recovery must work in conjunction with the educational system where the school team mounted the intervention and the system supported the program's principles.

Pinnell, et al.'s (1995) response to Rasinski's commentary also appeared contradictory. The researchers suggested that although substitute teachers hired to work with the other treatment groups had less experience they were not inexperienced; however, RR teachers had an average of 17.6 years of experience compared to RS teachers (3.5 years), DISP teachers (8.1 years), RWG teachers (15 years) and control group teachers (16.8 years). The authors cited Britzman who contends that reflection and learning were more critical to becoming an expert teacher than years of experience. Britzman indicated experience had value only if examined critically. Reading Recovery training offered reflective practice in on-going professional development

again suggesting that RR teachers were at an advantage. Pinnell argued many substitute teachers attend diverse professional development activities making researchers skeptical of the significance of this factor on their research. Nevertheless, in their rebuttal the researchers did not document or compare the types of staff development activities available for the teachers in each group. Rasinski's reply alleged that "it's a stretch to believe, for example, that the Reading Recovery (RR) and Reading Success (RS) teachers are equivalent and that differences in student achievement are due solely to the nature of the RR treatment" (Rasinski, 1995b, p. 276). Pinnell et al. attributed the maximization of instructional time in Reading Recovery lessons to the training model, but did not indicate any agreement that this may have influenced study results.

Finally, the Reading Recovery proponents refuted the issue of cost-effectiveness by discussing a study conducted by Her Majesty's Office for Standards in Education which indicated that the program was run efficiently and was cost effective. Pinnell et al. suggested that one can not measure cost effectiveness by gains in reading; rather, effectiveness should focus on

whether children became independent readers. Pinnell et al. indicated "the goal of RR is not progress; it is enabling a child at a very young age to develop a self-extending system for reading" (Pinnell et al., 1995, p.274).

Reading Recovery Program Components

The goal of achieving a self-extending system was accomplished through use of the six Reading Recovery program components during each lesson. A student began each session by rereading familiar books. The student then read a relatively unfamiliar text while the teacher diagnosed the reading strategies the student employed using a running record. The teacher asked the child to compose a sentence orally and assisted him in spelling each word correctly. Afterward the teacher cut apart the sentence and the child put it back together like a puzzle. The final lesson step was the introduction and reading of a new text. At any point during the lesson the Reading Recovery teacher used the word work component to facilitate reading improvement (Clay, 1993b).

The writing portion of the Reading Recovery lesson gave children an opportunity "to examine details of

written language in a situation where they already know what the message means and where the language is their own" (Pinnell, 1990, p. 286). Writing was a collaborative and interactive effort. The teacher helped the child analyze unknown words while using her careful observations to nudge him toward independence.

According to program proponents the writing portion played a major role in the acceleration of children. Clay (1992) described additional activities that the brain and eye must accomplish when creating a story. These included: attending to letter features and spatial concepts, constructing words letter by letter, segmenting sounds in words, ordering and sequencing print and breaking down the writing task into the smallest segment while synthesizing words and sentences. Clay believed that the "building-up" processes complement the "breaking-down" process of visual analysis of text required in reading.

As children attempted to build words for their sentences they often encountered words they were unable to spell. Reading Recovery teachers employed a phonemic segmentation strategy developed by D. B. Elkonin in their lessons. Elkonin analysis assisted children in seeing sound - symbol relationships and developing

phonic principles (Clay, 1993a). Although Iversen and Tunmer (1993) attributed increases in phonemic awareness to Elkonin analysis, researchers did not support this contention or explore the effect Elkonin analysis might have on spelling with additional studies.

Elkonin, a Russian psychologist, believed that reading was the act of deriving meaning from sounds. He indicated that good first instruction should reveal the sound structure of language to children.

Elkonin devised a system for phonemic segmentation that provided support to young readers (Elkonin, 1973).

Elkonin designed his procedure to help children develop the "operation of sound analysis of speech so that it will become entirely mental" (Elkonin, 1973, p. 560). Elkonin used the following stages for developing entirely mental operations as a basis for his approach:

1. Establishing a preliminary conception of the task.
2. Mastering the operation with objects.
3. Mastering the operation at the level of overt oral speech.
4. Transferring the operation to the mental level.

5. Operating at the entirely mental level (Elkonin, 1973, p. 560).

From this base, Elkonin devised a structure for establishing the basic conception of the sound segmentation task. Children looked at pictures of common objects. There was a rectangular box divided into smaller boxes - one for each sound heard in the word under each picture. As the experimenter pronounced the name of the pictured object slowly, the child moved a plain counter into each box each time he heard a new sound. After modeling, the experimenter expected the child to say the word himself and move the counters. This helped the children hear the separate sounds in words while providing a schema for the number of sound elements in each word.

The results of Elkonin's first experiments indicated that virtually no children could master the operation of analysis by sound structure. Of the fifteen subjects studied, one analyzed five words and five others could analyze one word each. Each child worked on forty examples.

Additional studies by Elkonin and his colleagues modified the initial method by substituting two colors

of counters, one to indicate vowel sounds and the other for consonants. As the children progressed, they worked with counters with vowels written on them rather than plain colored counters. The new counters changed words to assist children in sounding the hard and soft consonant sounds of the Russian language. During experimental teaching 95% of 6 and 7 year old children were successful with the word changing analysis (Elkonin, 1973).

Wilder (1972) attempted to replicate Elkonin's sound discrimination procedure. He studied eight kindergarten children. The experimental group received training using pictures and counters. The control group did not use these devices. Wilder reported there was no difference in the ability to analyze sounds between the two groups on either the training list or a new list of words. Possible reasons for the failure to replicate Elkonin's work included the length of time spent in training students, differences between the Russian and English languages and the age of the subjects (Wilder, 1972).

Clay expanded Elkonin's analysis procedures for use in the writing portion of the Reading Recovery lesson. Reading Recovery students analyzed words using counters

in the initial stages of instruction. As the children progressed, they dropped the use of counters and began to analyze the sounds in an oral mode. Once students identified sounds, they were immediately represented in a graphic form. Teachers placed any analyzed word back in the context of the student's written message. Eventually, children began to analyze words without relying on the schematic structure (Clay, 1993a).

Conclusion

Over the past two decades, the philosophical shift to holistic instructional practices reduced spelling skill instruction in the traditional form (Anderson, Hiebert, Scott, Wilkinson, 1985). Proponents of natural language learning instruction did not list spelling as a required program component (Butler, 1988; Hillerich, 1990). Instead, individualized writing conferences served as a vehicle for spelling instruction. Students corrected misspelled words during the editing phase of the writing process. Proponents encouraged teachers to select words for study from individual errors in student writing. In turn, students used invented spellings based on sound - symbol correspondences until they edited their work. The use of invented spelling came under attack from parents and the media (Levey, 1995).

Two factors affected a student's spelling performance. First, cognitive functioning affected spelling as a child attempted to integrate graphemic, syntactic, phonemic and orthographic information (Waters, Bruck, Malus-Abramowitz, 1988). Phonemic awareness was the second factor related to spelling ability. The use of phonemic segmentation training, or word analysis training, successfully improved reading and spelling skills (Ball & Blachman, 1991; Lie, 1991; Tangel & Blachman, 1991).

The Reading Recovery program, developed by Marie Clay, also improved spelling performance; but, research had not determined which component of the program created this increase (Clay, 1993a). Tunmer and Iversen (1993) suggested that the use of Elkonin analysis in the writing portion of the lesson improved phonemic awareness. A number of researchers used modifications of Elkonin analysis in their studies to assess phonemic awareness (Ball & Blachman, 1991; Center et al., 1992; Tangel & Blachman, 1991; Uhry & Shepherd, 1990). The results of these studies and research related to Reading Recovery suggested the use of Elkonin analysis in the Reading Recovery program may also improve standard spelling performance in at-risk first graders

(Center et al., 1992; Clay, 1979, 1993b; Glynn et al. 1989; National Diffusion Network, 1991). If found true, teachers might use the Elkonin analysis procedure in other settings to improve the spelling of first grade students.

CHAPTER III

Methodology

The focus of this study was to determine whether individualized writing instruction with phonemic segmentation would affect the standard spelling performance of at-risk first grade students. To accomplish this task a research design was developed to compare two treatment groups and a control group. The remainder of this chapter will discuss each of the elements of the design in more specific detail in the following order: (a) description of the design, (b) study procedures, (c) description of the population, (d) instrumentation, (e) data analysis, (f) limitations of the study.

Description of the Design

This study used a three-factor design for the primary purpose of comparing three instructional groups, two treatment groups and a control group. The treatment groups included an individualized writing instruction with phonemic segmentation group and an individualized writing instruction without phonemic segmentation group.

These instructional groups served as three levels of the independent variable 'group' in this design.

Cognitive Abilities Test scores were used to classify subjects into high, average and low ability groups (Mitchell, 1985; Sax, 1984). Subjects were also classified as having low, medium or high phonemic awareness levels using the Yopp-Singer Test of Phoneme Segmentation. The Basic Achievement Skills Individual Screener (BASIS) spelling subtest measured spelling performance score, the dependent variable (The Psychological Corporation, 1982). Triads were formed by matching subjects on phonemic awareness level, race, age, and sex. Members in each triad were randomly assigned, one to each of the three instructional groups.

A sample of 24 matched triads, selected from a population of all Chapter I eligible first grade students, received instruction from teachers trained in the Reading Recovery Elkonin analysis method. In an effort to reduce invasiveness and maintain the instructional expectations of the regular Chapter I curriculum, the Chapter I program administrator requested that no more than three students per class be assigned to any treatment group. A table of random numbers was used to assign one member of the 24 triads

to treatment group 1, one member to treatment group 2, and one to the control group. This procedure continued until 3 students were assigned to a treatment group in the majority of classes. A modified procedure began with students "forced" into one of the three study groups until each class had met the three student limit. This restriction eliminated nine students from the study.

Study Procedures

Prior to the study's onset, the researcher conducted a training session to review the treatment procedures. Each teacher received instruction on the Writing Section of the Reading Recovery program. Teachers learned the Elkonin analysis procedure used in the Reading Recovery program and demonstrated proficiency in this method. Teachers compiled demographic data and shared a testing time frame during the initial training session (see Appendix A).

Subjects who were eligible to participate in the study took the Yopp-Singer Test of Phoneme Segmentation to determine their level of phonemic awareness. Following matching and forced random assignment to one of the three groups, the investigator tabulated the

subjects' pretest Basic Achievement Skills Individual Screener (BASIS) spelling subtest scores. Trained graduate students and reading specialists conducted initial testing.

Trained teachers provided treatment twice a week to individual students beginning in February and continuing for 12 weeks. Members of treatment group 1 (with phonemic segmentation) wrote a sentence of their choosing twice weekly. Each student had a spiral bound journal that, when opened flat, included a work page at the top for analyzing sounds and a page for the correctly spelled sentence at the bottom. Teachers assisted the students by drawing segmentation boxes. Students used circular disks to represent each sound within unknown words. Subjects pushed the disks into the segmentation boxes one at a time as they orally repeated each sound. During each treatment, students segmented a minimum of one word and a maximum of two words in this manner.

After analysis with the disks, the subject attempted to spell the unknown word in the segmentation boxes and then copied it correctly in his sentence. Teachers supplied unknown letters and corrected errors in segmentation. In the event the student correctly

spelled each word in the sentence, his teacher accepted his work for that day. In the following session, the teacher asked the child to create a more challenging sentence. For example, the teacher might say, "Let's make a sentence we'll have to do some work on today." Following each treatment, the teacher underlined any word a child spelled correctly without assistance.

Subjects selected for the second treatment (without phonemic segmentation) also used a spiral bound journal for their sentences. Students used the bottom page for writing sentences; however, the top page remained blank.

Subjects wrote a sentence of their choosing during each treatment. The teacher correctly spelled aloud a minimum of one and a maximum of two words for the subject to copy correctly into the sentence. Following the lesson, the teacher underlined any word the child spelled on his own (see Appendix B). The control group received no additional writing instruction emphasizing spelling.

Following the 12 weeks of instruction, individual students were post-tested using the spelling measure and phonemic awareness test. Trained graduate students and

reading specialists, unaware of which children received treatment, conducted all testing.

The students took the Cognitive Abilities Test in the spring as part of the end of the year testing program. Test administration conducted by Chapter I teachers followed guidelines outlined by the test developers.

Description of the Population

The population for this study included all Chapter I eligible first grade children enrolled in fifteen non-public elementary schools in the Tidewater and Richmond areas of Virginia. The Chapter I program administrator recommended sites. Non-public schools received Chapter I services if they were in areas with public schools that also qualified for Chapter I programs and demonstrated a need for services.

The Chapter I program selected students for services using a multiple criterion method. A referral form, history of promotion or retention and standardized testing results determined student eligibility. The recommendations of the child's teacher received significant value in placement decisions. Teachers viewed students who received Chapter I service as having

the greatest academic needs (A. Martin, personal communication, March 2, 1998).

Types of students served in Chapter I programs varied from school to school. Socioeconomic levels fluctuated from fairly affluent to areas in which 60% of the families lived below the poverty level. School size fluctuated from a low of 80 to a high of 479 students. Racial makeup of the student population also varied. Students at most schools were representative of the geographic area in which they were located. Each school served one race predominantly, either Caucasian or African-American. Caucasians were the majority at ten of the fifteen schools served, while African-Americans were the majority at the other five. The total population was composed of 49 Caucasians, 29 African-Americans, 1 Asian, 1 Hispanic and 1 child of mixed race.

Children served through the Chapter I program met with a resource teacher 45 minutes per day four times a week. Children received instruction in groups ranging from 3 to 7 children with an average group size of 4 students. Chapter I students received instruction in reading or math depending on their greatest need. The Chapter I curriculum supported instruction received in

the regular classroom. Teachers made instructional decisions based on the student's weaknesses and information provided by classroom teachers (A. Martin, personal communication, March 2, 1998).

All children served in Chapter I received regular classroom instruction in commercially produced series. The individual schools embraced the use of conventional spelling and early writing. Formal spelling instruction occurred in first grade classrooms.

Instrumentation

The Yopp-Singer Test of Phoneme Segmentation, an individually administered test, "measures a child's ability to articulate the sounds of a word separately, in order" (Yopp, 1988, p. 165). Yopp selected words for the test based on feature analysis and word familiarity. The 22 words represented all common locations and articulations of consonants and all common locations and heights of vowels present in English (see Appendix C).

The Yopp-Singer Test of Phoneme Segmentation took approximately 5 to 10 minutes to administer. Testers played a word game where children heard a word and then broke it down into individual sounds. Children received praise for correct responses and test administrators

corrected errors. Words segmented correctly without assistance received one point.

In her comparative study of ten phonemic awareness measures, Yopp (1988) found high construct validity between each test, including the Yopp-Singer Test of Phoneme Segmentation. Her study further refined the construct validity of the concept by "revealing two highly related factors that underlie phonemic awareness: Simple Phonemic Awareness and Compound Phonemic Awareness" (Yopp, 1988, p. 175). Test reliability was determined using Cronbach's alpha. The Yopp-Singer Test of Phoneme Segmentation showed high internal consistency (α= .95). In order to assess the predictive validity of each of the ten instruments, Yopp administered a criterion learning test that evaluated the 104 kindergarten children's ability to identify artificial words after instruction in sounding and blending. The Yopp-Singer Test of Phoneme Segmentation significantly related to the criterion learning test (r = .67).

The Basic Achievement Skills Individual Screener (BASIS) spelling subtest measured standard spelling knowledge in this study. Floden recommended this "efficient general achievement test" for conducting

research (Floden, 1985, p. 134). The individually administered spelling subtest scored as either a criterion referenced test or norm-referenced test. For the purposes of this study raw data and norm-referenced data were collected.

The BASIS spelling subtest required the test administrator to call out a spelling list to the subject, who in turn wrote down each word. Testing continued until a child missed five consecutive words.

The reliability of the BASIS was determined using the Kuder-Richardson Formula 20 and by determining test - retest reliability. For children ages 6 and 7, r values of .90 and .94, respectively, were obtained. Test - retest measures for spelling registered r values of .94, .90 and .94 in grades 2, 5 and 8. Reviewers considered the reliability of the BASIS high for a short test (Schutz, 1985).

Test creators determined validity by comparing the BASIS scores with school grades and standardized achievement test scores. BASIS scores and spelling grade had a correlation of .29 at the second grade level and .47 at the third grade level. Comparison with standardized spelling measures registered correlations

of .43 at grade 2 and .67 at grade 3. Correlations for first grade were not available.

There were several advantages to using the BASIS spelling subtest. First, this oral test represented the process of spelling used when children actually write. It allowed the examiner to analyze attempts and misspellings for additional information about how a child approached the spelling task. Administration of the BASIS spelling subtest took a relatively short period of time which was efficient. Finally, test designers used the BASIS with special education students. The test materials' layout and typeface considered learning disabled and visually impaired students (Schutz, 1985). This was advantageous since first grade at-risk students may qualify for special education services but were not yet identified due to their age. If any of the test subjects fell into this group, spelling test results from the BASIS would be more accurate than those from a standardized test that had not considered special populations.

The Cognitive Abilities Test (CogAT) was used to measure "'generalized thinking skills' needed by young children in most aspects of the school curriculum" (Sax, 1984). The test consisted of a Primary Battery with two

levels for grades K-2 and a Multilevel Battery for Grades 3 - 12. The untimed test included four subtests: relational concepts, object classification, quantitative concepts and oral vocabulary. Test administration took approximately 12 - 16 minutes per subtest, with its actual length largely determined by the reading rate of the tester. Results reported a single standard age score (SAS) which had a mean of 100 and standard deviation of 16.

In 1977 and 1978 the CogAT and Iowa Test of Basic Skills were concurrently standardized. Test creators selected the norming sample using three stratification variables; community socioeconomic level, enrollment of school district and geographic location. Racial-ethnic composition of the sample was representative of the country as a whole.

Reliability of the CogAT was determined using the K-R 20 procedure. Reliability estimates were high, ranging from .89 to .96. "Little if any direct evidence is available for estimating the validity of...the CogAT" (Sax, 1984, p. 432).

Generally speaking, the CogAT was considered one of the best among group intelligence and scholastic

aptitude tests (Sax, 1984). Its mandated use in first grade Virginia classrooms made it the preferred measure of ability for the proposed study.

Data Analysis

The data gathered in the current study was analyzed using a 3X3X3 analysis of covariance (ANCOVA). The three factors included cognitive ability with three levels, phonemic awareness with three levels and treatment group with three levels. The pretest served as a covariate. Matched groups served as a blocking variable. If warranted, differences in levels of the independent variables were tested using Tukey's t-test. The .01 level of significance was used in the current study.

An analysis of spelling performance scores and cognitive ability was conducted using the analysis of covariance (ANCOVA) statistical procedure. Tukey's t-test procedure was conducted post hoc for differences in levels of the independent variable when warranted.

The use of a factorial design with one dependent variable and pre-test score indicated an analysis of covariance statistical procedure.

Limitations of the Study

There were five potential limitations to the study. First, there was a possibility that mortality, loss of subjects, might have an impact on the results. Beginning the study with the largest sample size available helped reduce this threat.

A diffusion of treatment also threatened the current study. There was a possibility that all children, including those in the control group, might be present in the classroom as the teachers provide treatment. The control group would experience some level of influence in this case. Teachers conducted treatment as far away from the other students as possible or in isolation to reduce this influence.

Careful test administration training and explicit procedures reduced the threat of error of instrumentation. Test administrators practiced administering the evaluations prior to the study to maintain consistent testing situations.

Compensatory rivalry and resentful demoralization were minor threats to the proposed study. Chapter I classrooms had an enrollment of four students on average. This small class size enabled the teacher to

provide a great deal of individualized attention to her students. The treatment design was non-invasive and attracted little additional attention from the control group and non-participating students.

Summary

The three-factor design described above was used to assess increases in standard spelling performance and phonemic awareness. The Yopp-Singer Test of Phoneme Segmentation, The Basic Achievement Skills Individual Screener test and Cognitive Abilities Test provided data for the study. Participants were selected from a population of at-risk first grade students who were members of non-public Chapter I programs in the Richmond and Tidewater areas of Virginia. Results were analyzed using a 3X3X3 analysis of covariance procedure.

CHAPTER IV

Findings

This chapter provides an analysis of data collected from first grade at-risk students related to spelling performance. Tables and discussion will be presented to address the statistical findings related to each research question.

Results

This study was conducted to determine whether a phonemic segmentation procedure based on the work of D. B. Elkonin would affect the standard spelling performance of at-risk first grade students. Because of commitment to rigorous standardization of test administration procedures, stringent criteria were used in choosing the final sample. Results of forty-two students from fifteen non-public elementary schools provided data for analysis. The students were grouped in matched triads based on sex, age, race and phonemic awareness level. In the final analysis there were 24 females, 18 males, 26 Caucasians, 14 African-Americans, 1 Hispanic and 1 student of mixed race. Students ranged in age from 6.3 to 7.9 years old. Students were

assigned to one of two treatment groups or the control group using a constrained randomization procedure.

Analysis relevant to the research questions will be addressed in order of their occurrence.

Research Question 1

> Did a difference in standard spelling performance exist among at-risk first graders who received individualized writing instruction including phonemic segmentation, those who received individualized writing instruction without phonemic segmentation but where correct spellings were provided and those who received no additional instruction?

This question was addressed using part of a three factor analysis of covariance (ANCOVA) on spelling performance scores as measured by the Basic Achievement Skills Individual Screener (BASIS) spelling subtest. Table 1 reflects the obtained scores for each member of the 14 triads and the difference between pretest and posttest spelling subtest scores. The mean differences showed a slightly higher increase for the with phonemic segmentation group (Treatment 1).

Table 1

Results of Spelling Pre-Tests and Post-Tests For Each Treatment Group

	Control			Instruction With Phonemic Segmentation			Instruction Without Phonemic Segmentation		
Triad	Pre	Post	Diff	Pre	Post	Diff	Pre	Post	Diff
1	1	9	8	2	9	7	4	10	6
2	15	14	-1	11	15	4	8	10	2
3	4	10	6	14	15	1	7	10	3
4	9	13	4	7	6	-1	8	12	4
5	9	12	3	12	15	3	13	15	2
6	13	14	1	3	9	6	4	10	6
7	2	10	8	7	9	2	10	7	-3
8	4	4	0	11	14	3	7	10	3
9	3	10	7	8	14	6	9	13	4
10	0	4	4	2	7	5	1	4	3
11	10	13	3	11	27	16	3	9	6
12	9	15	6	7	14	7	3	2	-1
13	14	19	5	6	12	6	0	2	2
14	2	12	10	4	11	7	3	10	7
Mean	6.78	11.36	4.58	7.50	12.64	5.14	5.71	8.85	3.14

Table 2 shows the test results from the analysis of covariance. The results of spelling posttest using the spelling pretest as a covariate showed there were no differences between treatment groups (p= .298), nor among phonemic awareness levels (p= .302). There was also no difference for the triads (p= .579). Post hoc testing was unnecessary because of the lack of significant differences.

Table 2

Analysis of Covariance for Spelling Post-test Score Using Spelling Pre-test Score as Covariate

Source	DF	Sum of Squares	Mean Square	F Value	P
Spelling Pretest	1	165.28	165.28	25.61	<.0001
Phonemic Aw.Group	2	16.31	8.15	1.26	.302
Triad(Phon Aw. Group)	11	61.81	5.62	.87	.579
Cognitive Ability	2	8.79	4.39	.68	.516
Treatment Group	2	16.52	8.26	1.28	.298
Error	22	141.97	6.45		
Total	40	592.10			

Research Questions 2 and 3

What effect did the use of individualized writing instruction including phonemic segmentation have on the standard spelling performance of at-risk first graders?

What effect did the use of individualized writing instruction without phonemic segmentation but where correct spellings were provided have on the standard spelling performance of at-risk first graders?

Table 1 shows an increase in spelling performance for the with phonemic segmentation group (Treatment 1) from a mean pretest of 7.50 to a mean posttest of 12.64. This reflects a mean difference of 5.14, a statistically significant increase ($t=4.897$, $p=.0002$). The second treatment group, without phonemic segmentation, showed a pretest mean of 5.71. The posttest mean measured 8.85 for a mean difference of 3.14. This mean difference was the lowest for the three groups. The increase was statistically significant ($t= 4.25$, $p= .0005$). The control group mean also increased, from 6.78 to 11.36, a statistically significant change ($t=5.45$, $p= .00006$). Although each instructional group showed gains in spelling performance, the results of the ANCOVA

indicated amounts of change for the treatment groups did not differ from one another.

Research Question 4

Was there a difference in standard spelling performance between students with high, medium and low phonemic awareness levels before and after treatment?

Table 3 reflects the standard spelling performance of students at each level of phonemic awareness. Prior to treatment, students with low phonemic awareness had the lowest mean on spelling performance scores (3.87). Students with medium phonemic awareness levels had a pretest spelling mean of 7.22 while high phonemically aware students had the highest spelling pretest mean at 8.72. Mean differences indicated that students at all three phonemic awareness levels showed growth in standard spelling performance. Students in the low phonemic awareness group made the largest mean gain in standard spelling score, 5.13 points. High phonemically aware students gained 4.33 and medium phonemically aware students gained the least with 2.78 points. (Each group's increase was significant with $p < .011$.) Even with the gains, a gap in standard spelling performance between the phonemic awareness groups remained after

treatment. Analysis of covariance results reported earlier (p= .302) showed that there were no significant differences in the changes in spelling performance scores for the three phonemic awareness groups.

Table 3

Standard Spelling Performance by Phonemic Awareness Level

	Mean(Std. Dev.) Spelling Performance		
Phonemic Aw. Group	Pre-test	Post-test	Difference
Low (N=15)	3.87(3.93)	9.00(4.07)	5.13(3.20)
Medium (N=9)	7.22(2.49)	10.00(4.82)	2.78(2.91)
High (N=18)	8.72(4.01)	13.06(4.15)	4.33(3.65)

Research Question 5

Was there a difference in standard spelling performance between students with low, average and high levels of cognitive ability before and after treatment?

Table 4 reflects the standard spelling performance of students at each level of cognitive ability. Prior to treatment, students with low cognitive ability had the lowest mean spelling performance (3.69). Students

with average cognitive ability level had a mean spelling performance of 7.38 while students with high cognitive ability had the best pretest mean spelling performance at 8.58. Mean differences showed that students at all three cognitive ability levels made growth in standard spelling performance. Students in the low cognitive ability group made the largest gain in mean standard spelling (4.15) with high cognitive ability students and average cognitive ability students trailing only slightly with mean standard spelling increases of 3.92 and 3.94, respectively. All increases were significant with $p < .001$. The analysis of covariance results reported earlier showed there were no significant differences among the cognitive ability groups ($p = .516$). Results are presented in Table 2.

Table 4

Standard Spelling Performance by Cognitive Ability Level

	Mean (Std. Dev.) Spelling Performance		
Cog. Ab. Group	Pre-test	Post-test	Difference
Low (N=13)	3.69(3.86)	7.85(3.98)	4.15(3.41)
Average (N=16)	7.38(3.28)	11.31(3.75)	3.94(2.35)
High (N=12)	8.58(4.36)	12.50(1.93)	3.92(3.10)

Additional Research Question

Following analysis of the data another area of interest arose.

Was phonemic awareness significantly improved through either of the two treatments?

Results of the phonemic awareness assessment are presented in Tables 5, 6 and 7. Table 5 shows an increase in phonemic awareness for treatment group 1 (with phonemic segmentation) from a mean pre-test of 11.00 to a mean post-test of 15.48. This reflects a mean difference of 4.48, a statistically significant increase ($t = 5.81$, $p = <.0001$).

Table 5

Phonemic Awareness Test Results For Each Treatment Group

	Mean(Std. Dev.) Phonemic Awareness Scores		
Treatment Group	Pre-test	Post-test	Diff
With P.Seg.	11.00(6.92)	15.48(5.22)	4.48(3.70)
Without P.Seg.	9.30(7.18)	13.17(5.21)	3.87(5.05)
Control	9.83(6.15)	12.09(5.81)	2.26(5.58)

The second treatment group (without phonemic segmentation) showed a pre-test mean of 9.30. The post-test mean measured 13.17 for a mean difference of 3.87. The increase was statistically significant ($t = 3.68$, $p = .0007$). The control group mean also increased from 9.83 to 12.09 and was also statistically significant ($t = 1.94$, $p = .032$). Analysis of variance results on the differences in phonemic awareness scores showed there were no significant differences among the treatment groups for increase in phonemic awareness level (see Table 6).

Table 6

Analysis of Variance for Differences in Phonemic Awareness Scores

Source	DF	Sum of Squares	Mean Square	F Value	P
Ph.Aw.Grp	2	655.90	327.95	2.34	.122
Triad(Ph.Aw Grp)	20	279.93	139.96	10.27	<.001
Treatment Grp	2	60.38	30.19	2.11	.135
P.Aw.Grp X Tr.Grp	4	38.36	9.59	.67	.617
Error	40	572.60	14.32		
Total	68	1607.17			

When each of the study groups was separated into high, medium and low phonemic awareness groups, several group differences were noted (see Table 7). First, mean differences for the high phonemically aware children indicated a ceiling effect occurred in the Yopp-Singer Test of Phoneme Segmentation for these students. High phonemically aware children in both treatment groups made gains in phonemic awareness; however, seven of the ten students in the control group obtained lower phonemic awareness posttest scores (see Appendix D). The remaining three children had no change in score. Mean difference results for high phonemically aware students were $\underline{M}$= -1.7, SD= 1.70 for the control group, $\underline{M}$ = 1.5, SD = 1.72 for the treatment 1 group (with phonemic segmentation) and $\underline{M}$ = 0.7, SD = 2.63 for treatment 2 (without phonemic segmentation). Students with medium levels of phonemic awareness had mean difference increases at all levels (control, $\underline{M}$=3.60, SD =6.69, treatment 1, $\underline{M}$ = 5.8, SD = 1.92, treatment 2, $\underline{M}$= 2.6, SD = 2.07) with students who participated in treatment 1 (with phonemic segmentation) making the greatest growth. The low phonemic awareness level students all made growth in phonemic awareness score but treatment group did not affect their gain (control,

M= 5.88, SD = 5.69, treatment 1, M= 7.22, SD = 3.49, treatment 2, M= 8.44, SD = 4.93).

Table 7

Means of Phonemic Awareness Test Scores For Each Phonemic Awareness Level

Phonemic Awareness Groups	Mean (SD) Phonemic Awareness Scores		
	Pre-test	Post-test	Diff
With P. Seg.			
High (N=10)	17.70(2.06)	19.20(3.08)	1.50(1.72)
Medium (N=5)	10.60(1.82)	16.40(1.95)	5.80(1.92)
Low (N=9)	3.11(1.83)	10.33(4.15)	7.22(3.49)
Without P. Seg.			
High (N=10)	16.20(2.15)	16.90(2.51)	0.70(2.63)
Medium (N=5)	8.40(4.51)	11.00(5.92)	2.60(2.07)
Low (N=9)	1.11(1.27)	9.56(4.45)	8.44(4.93)
Control			
High (N=10)	15.70(3.59)	14.40(4.01)	-1.30(2.06)
Medium (N=5)	8.20(1.79)	11.80(7.60)	3.60(6.69)
Low (N=8)	3.50(1.85)	9.38(6.02)	5.88(5.69)

Summary

The results of this study determined that there were no differences in standard spelling performance among the two treatment and control groups. Growth in phonemic awareness was evident in each treatment group; however, results for the high phonemically aware students indicated a ceiling effect occurred in the testing. Results of an analysis of variance indicated there was no difference in phonemic awareness level for the three treatment groups.

Chapter V

Conclusions and Recommendations

This final chapter is organized into two sections: (1) conclusions about the research questions and (2) recommendations for additional research.

Conclusions

The purpose of this study was to determine whether individualized writing instruction using a phonemic segmentation procedure based on the work of D. B. Elkonin would affect the standard spelling performance of at-risk first grade students. Students participated in a twelve week training program using either the Elkonin analysis phonemic segmentation procedure or an alternate treatment where teachers provided correct spellings. One third of the subjects were members of the control group. The Basic Achievement Skills Individual Screener (BASIS) spelling subtest and the Yopp-Singer Test of Phoneme Segmentation were used for data collection in this study.

From the review of literature it was apparent that segmentation activities increased students' phonemic awareness ability (French & Feng, 1992). Phonemic awareness activities also increased spelling and reading

performance (Ball & Blachman, 1991; Juel, Griffith, Gough, 1986; Klesius et al., 1991; Lie, 1991; Tangel and Blachman, 1992; Uhry & Shepherd, 1990). Clay (1993b) noted that students who participated in the Reading Recovery program for at-risk first grade readers also showed gains in spelling performance. Due to these research results, Tunmer and Iversen (1993) suggested that the writing portion of the Reading Recovery lesson which includes the Elkonin analysis procedure might be responsible for the growth in standard spelling performance in Reading Recovery students. Additional factors of cognitive ability (Lie, 1991, Walters, Bruck, Malus-Abromowitz, 1988) and phonemic awareness level (Klesius et al., 1991) were related to growth in spelling. This study sought to determine whether individualized writing instruction using phonemic awareness would improve standard spelling performance when the additional factors were taken into consideration.

The first three research questions looked at whether either treatment had an effect on standard spelling performance. Comparisons for differences were achieved through an analysis of covariance statistical procedure. As noted earlier, there were no

statistically significant differences among the two treatment groups and control group.

This result is in contrast to several of the previous phonemic awareness studies. Lie (1991) concluded that phonemic awareness training improved spelling scores. His study showed that sequential segmenting instruction was superior to isolated segmenting in improving spelling. His study also differed from the current study in frequency of treatment. Lie's subjects received segmentation training daily for 10 - 15 minutes. Research by Ball and Blachman (1991) as well as by Uhry and Shephard (1990) used longer and more frequent treatment periods. The current study conducted training in 5 to 10 minute sessions only twice a week for twelve weeks. Increasing the length and/or frequency of treatment in the current study may have produced differences in standard spelling performance results.

Both Ball and Blachman (1991) and Tangel and Blachman (1992) found that phonemic awareness training improved spelling performance. Both studies used a procedure similar to Elkonin analysis; however, they also provided instruction in letter naming and letter sound correspondence. It is difficult to assess whether

the phonemic awareness training itself was the only cause of increased spelling ability.

The strength of the present study is the use of the phonemic awareness treatment without instruction in additional related areas. Results of the current study indicate that training in the Elkonin analysis phonemic segmentation procedure alone can not account for changes in spelling performance.

A number of studies indicated that successful spellers use more than their knowledge of letter sounds when spelling. Visual-orthographic knowledge also had an impact on spelling in research by Barron (1980) and Ehri (1978). Barron found that poor readers relied primarily on phonological information for spelling unlike good readers who relied on visual-orthographic and phonological information. Barron suggested that poor readers may not have a large enough store of visual-orthographic entries in their lexicons to be successful spellers.

Ehri (1978) described the process students use when spelling. Initially children matched some phonemic segments in words. For words to become part of lexical memory the student had to amalgamate phonological, syntactic and semantic information to form a single

unit. This orthographic image was responsible for ensuring accurate production of the word.

Griffith and Klesius (1992) noted that phonemic awareness and letter name knowledge explained 57% of the variance in spelling score; however, these same factors only accounted for 9% of the variability in acquiring orthographic knowledge. Phonemic awareness and letter name knowledge were, therefore, not an effective predictor for the acquisition of orthographic knowledge. As previously noted by Ehri (1978), this knowledge was essential for accurate spelling.

Stage and Wagner (1992) indicated that there was evidence that maturation had an effect on phonological and orthographic knowledge. The current study lends support to the belief that phonemic awareness, orthographic knowledge and other factors may affect standard spelling performance. The interrelationship and influence of these factors on spelling require further investigation.

One other aspect of the current study deserves mention. Reading Recovery proponents have repeatedly suggested that their program produced results not because of one individual component, but through the interaction of all components. Due to this belief there

has been reluctance on the part of Reading Recovery researchers to look at the program components individually. The current study isolated the Elkonin analysis procedure used in the writing portion of Reading Recovery lessons for independent evaluation. Current results note that this procedure alone is not responsible for growth in standard spelling performance and may indirectly support the claim of Reading Recovery proponents.

Following analysis of the effects of treatment the study looked at the differences in standard spelling performance among the three phonemic awareness levels. The analysis of covariance indicated that there were no differences in spelling performance scores among the three phonemic awareness levels. Based on the research of Ball and Blachman (1991) and Lie (1991), there was an expectation that students with low phonemic awareness levels would show greater improvement in spelling score following treatment. The current study did not support this contention.

The fifth research question addressed the standard spelling performance of students with low, average and high levels of cognitive ability before and after treatment. There was an expectation based on research

by Lie (1991) that students with lower cognitive ability would have greater gains in spelling than those with average or high levels. Even though the low level students had the largest mean increase in spelling score, there was no significant difference among the cognitive ability groups in the analysis of covariance.

Past studies (Adams, 1990a; Hoein, et al., 1995) have noted that phonemic awareness was a stronger predictor than cognitive ability in determining reading and spelling success. Results from this study indicate cognitive ability did not influence gains in spelling performance.

Stage and Wagner (1992) noted that a developmental relationship exists between working memory and spelling. Perhaps the Cognitive Abilities Test did not appropriately assess the relationship between ability and standard spelling performance. Replication with a test that specifically assesses working memory may yield significant results.

Following the initial data analysis, a question arose regarding the ability of the two treatments to improve phonemic awareness. Mean differences showed that students who participated in the individualized writing instruction with Elkonin analysis made a greater

gain in phonemic awareness level. This result was consistent with previous research but was not confirmed by the analysis of variance test. The results of the analysis of variance indicated that there was no difference among the treatment groups.

French and Feng (1992) used a procedure similar to Elkonin analysis that produced increases in phonemic awareness. Their study included classroom instruction with phonemic activities. One can not separate out the additional factors as possible influences on the growth in phonemic awareness. Wilder (1972) attempted to replicate Elkonin's work. He found no difference in students' ability to analyze sounds following treatment. Wilder attributed his replication difficulties to the age of his subjects, differences between the Russian and English language and the length of treatment. Of these three possibilities only length of treatment would apply to the current study.

Three possible explanations exist for the current results. First, there was a large amount of variability among the phonemic awareness scores. Although all the students were classified as at-risk, individual participants varied widely in ability at both the pre-test and post-test sessions. In addition, the Yopp-

Singer Test of Phoneme Segmentation had a ceiling effect for high phonemically aware students that may have influenced the mean difference in scores for all three treatment groups. Finally, there may have been variability in the instruction provided by the Chapter I teacher at each of the fifteen test sites.

Summary of Study Conclusions

The results of the current study indicated that no differences in standard spelling performance existed among the two treatment and control groups, phonemic awareness levels or cognitive ability levels. The results suggested that there may be other factors that interact with phonemic awareness to affect standard spelling performance. Length and frequency of treatment may have also influenced the outcome of this study. Study results showed a larger gain in phonemic awareness for students who participated in the first treatment, individualized writing instruction with phonemic segmentation; however, there were no differences between the treatment groups based on the analysis of variance. Variability in the data, a ceiling effect on the Yopp-Singer Test of Phoneme Segmentation and variability in instruction may have influenced the results.

Recommendations for Additional Research

Recommendations for further research include replication of the current study to determine whether an increased sample size might produce more robust results. Additionally, a different measure of phonemic awareness could have an impact on the results. In the current study the Yopp-Singer Test of Phoneme Segmentation produced a ceiling effect for high phonemically aware children. An increase in the length or frequency of training sessions might also impact the results of future investigations.

A question still remains regarding strategies to improve the spelling of at-risk students. Although some researchers (Ball & Blachman, 1991; Lie, 1991) showed spelling improvement occurred with phonemic awareness training, the current study did not support these findings. Prior training programs included other instructional procedures like letter name instruction and letter - sound training as part of treatment (Ball & Blachman, 1991; Tangel & Blachman, 1992). Which, if any, of these procedures may have contributed to gains in spelling is still an open question.

In the future, additional research on high phonemically aware children would be beneficial.

Researchers may wish to look at a more discriminating test of phonemic awareness for students who enter first grade with highly developed phonemic awareness skills.

A significant body of research reported that level of phonemic awareness was related to reading ability, with students who had high phonemic awareness showing stronger reading skill. Although some of the subjects in the current study were highly phonemically aware, they were still considered at-risk readers. As such, they received the same level of services as low phonemically aware at-risk readers. Future research might attempt to assess whether phonemic awareness level has any effect on the teacher's perception of who is categorized as an at-risk reader. The use of phonemic awareness as a criterion for placement in remediation programs should also be considered.

Of significant concern is the increase in emphasis on phonemic awareness in instructional programs throughout the country. Thoughtful consideration must be given to the value of extensive intervention for *all* children. Future research needs to assess the effectiveness of various phonemic awareness training methods as well as the students that benefit most from training. The current study points to the need to

earmark financial resources for students who will benefit most based on research in this area.

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Appendix A

Teacher Training Information

AGENDA

I. INTRODUCTIONS

II. READING RECOVERY OVERVIEW

III. PHONEMIC AWARENESS

IV. ELKONIN ANALYSIS

V. PRACTICE TECHNIQUES

VI. STUDY INFORMATION

VII. DATA COLLECTION

VIII. PLAN FOR TEST ADMINISTRATION

JOAN A. RHODES
(703) 780-0179 HOME
(703) 780-5310 WORK

TREATMENT 1
INDIVIDUALIZED WRITING WITH PHONEMIC ANALYSIS

1. CHILD GENERATES SENTENCE ORALLY.

2. TEACHER JOTS DOWN SENTENCE AND DECIDES ON ONE OR TWO UNKNOWN WORDS TO ANALYZE.

3. STUDENT BEGINS WRITING.

4. TEACHER DRAWS BOXES ON TOP HALF OF BOOKLET.

5. TEACHER MODELS PUSHING PENNIES TWICE.

6. STUDENT PUSHES PENNIES TWICE.

7. TEACHER ASKS STUDENT WHAT HE HEARS.

8. TEACHER HELPS STUDENT PUT LETTERS IN CORRECT BOXES. (IN THE CASE OF SH, TH, CH EA, AI, ETC., THE TEACHER ADDS DOTTED LINES TO THE BOXES)

9. THE STUDENT ADDS WORD TO THE SENTENCE.

10. THE TEACHER MAY REPEAT THIS PROCESS WITH ONE OTHER WORD. COMPLETE THE SENTENCE. THE STUDENT READS THE SENTENCE ALOUD.

11. THE TEACHER UNDERLINES ANY WORD THE CHILD SPELLED INDEPENDENTLY.

NOTE: THE TEACHER WRITES IN ANY WORDS THE CHILD CAN NOT WRITE HIMSELF, EXCEPT THE TARGET WORDS. IF THE STUDENT CAN SPELL ALL THE WORDS CORRECTLY, ACCEPT THE SENTENCE FOR TODAY. ENCOURAGE A MORE DIFFICULT SENTENCE FOR THE NEXT SESSION.

PLEASE MAKE-UP SESSIONS WITH ABSENT STUDENTS. GIVE NO MORE THAN ONE TREATMENT IN ANY DAY.

TREATMENT 2

INDIVIDUALIZED WRITING WITHOUT PHONEMIC ANALYSIS

1. CHILD GENERATES SENTENCE ORALLY.

2. TEACHER JOTS DOWN SENTENCE AND DECIDES ON ONE OR TWO WORDS TO ANALYZE.

3. STUDENT BEGINS WRITING.

4. TEACHER SPELLS UNKNOWN WORD ORALLY.

5. CHILD ADDS WORD TO SENTENCE.

6. TEACHER MAY REPEAT THIS PROCEDURE WITH ONE ADDITIONAL WORD.

7. STUDENT FINISHES SENTENCE AND READS IT ALOUD.

8. TEACHER UNDERLINES ANY WORD STUDENT COULD SPELL INDEPENDENTLY.

NOTE: THE TEACHER WRITES IN ANY WORDS THE CHILD CAN NOT WRITE HIMSELF, EXCEPT THE TARGET WORDS. IF THE STUDENT CAN SPELL ALL THE WORDS CORRECTLY, ACCEPT THE SENTENCE FOR TODAY. ENCOURAGE A MORE DIFFICULT SENTENCE FOR THE NEXT SESSION.

PLEASE MAKE-UP SESSIONS WITH STUDENTS WHO ARE ABSENT. GIVE NO MORE THAN ONE TREATMENT IN ANY DAY.

TEACHER INFORMATION SHEET

NAME_____

SCHOOL NAME_____

SCHOOL ADDRESS_____

_____

TELEPHONE: WORK_____HOME_____

NUMBER OF YEARS TEACHING_____

SUBJECTS OR GRADES TAUGHT_____

_____

EDUCATION LEVEL (CHECK ALL THAT APPLY)

H.S. DIPLOMA _____

BACHELOR'S DEGREE_____
TYPE_____YEAR_____

MASTER'S DEGREE
TYPE_____ YEAR_____

POSTGRADUATE DEGREE
TYPE_____YEAR_____

HAVE YOU HAD ANY EXPERIENCE WITH READING RECOVERY OR ELKONIN ANALYSIS? DESCRIBE._____

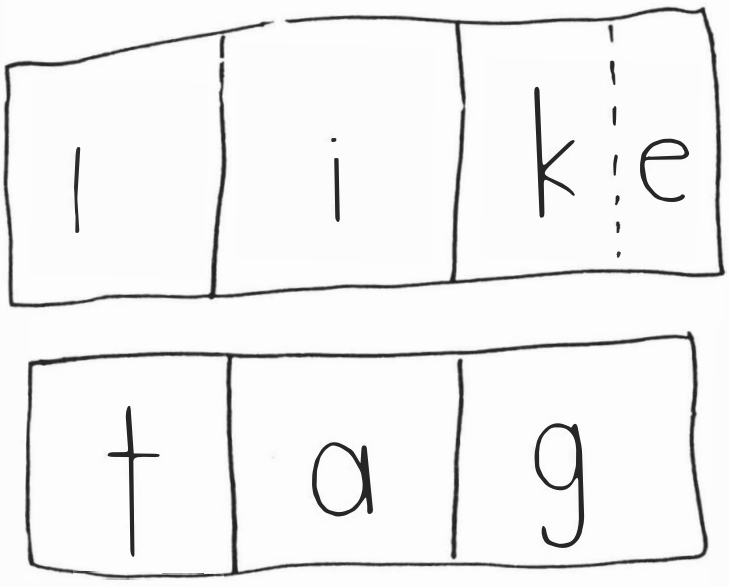
_____

_____

THANK YOU.

Appendix B

Children's Samples



I like to play freeze tag.

4-18-97

I see frogs
in my backyard.

Appendix C

Yopp - Singer Test of Phoneme Segmentation

Yopp-Singer Test of Phoneme Segmentation

Student's name_____ Date _____

Score (number correct)_____

Directions: Today we're going to play a word game. I'm going to say a word and I want you to break the word apart. You are going to tell me each sound in the word in order. For example, if I say "old," you should say /o/ - /l/ - /d/." (*Administrator: Be sure to say the sounds, not the letters, in the word.*) Let's try a few together.

Practice items: (*Assist the child in segmenting these items as necessary.*) ride, go, man

Test items: (*Circle those items that the student correctly segments; incorrect responses may be recorded on the blank line following the item.*)

1. dog	_____	12. lay	_____
2. keep	_____	13. race	_____
3. fine	_____	14. zoo	_____
4. no	_____	15. three	_____
5. she	_____	16. job	_____
6. wave	_____	17. in	_____
7. grew	_____	18. ice	_____
8. that	_____	19. at	_____
9. red	_____	20. top	_____
10. me	_____	21. by	_____
11. sat	_____	22. do	_____

Appendix D

Raw Data for the Yopp-Singer Test of Phoneme Segmentation by Phonemic Awareness Level

Treatment One (with Phonemic Segmentation)

High (N = 10)			Medium (N = 5)			Low (N = 9)		
Pre	Pos	Dif	Pre	Pos	Dif	Pre	Pos	Dif
18	20	2	9	14	5	5	15	10
16	16	0	10	17	7	3	10	7
14	13	-1	9	17	8	0	4	4
17	22	5	13	19	6	1	12	11
20	22	2	12	15	3	5	14	9
18	21	3				2	12	10
21	22	1				3	3	0
18	18	0				4	12	8
16	17	1				5	11	6
19	21	2						

Treatment Two (Without Phonemic Segmentation)

High (N = 10)			Medium (N = 5)			Low (N = 9)		
Pre	Pos	Dif	Pre	Pos	Dif	Pre	Pos	Dif
16	13	-3	10	10	0	2	8	6
16	20	4	8	11	3	0	12	12
18	20	2	1	2	1	1	5	4
19	15	-4	13	18	5	0	15	15
15	15	0	10	14	4	4	8	4
14	18	4				1	16	15
14	15	1				1	12	11
20	20	0				1	3	2
16	17	1				0	7	7
14	16	2						

Control

High (N = 10)			Medium (N = 5)			Low (N = 8)		
Pre	Pos	Dif	Pre	Pos	Dif	Pre	Pos	Dif
14	10	-4	6	5	-1	3	2	-1
18	16	-2	8	21	13	5	5	0
12	13	1	11	18	7	0	1	1
14	15	1	8	11	3	3	12	9
16	12	-4	8	4	-4	5	13	8
20	20	0				6	10	4
15	14	-1				3	15	12
22	22	0				3	17	4
16	12	-4				1	-	-
10	10	0						

Appendix E

Raw data for BASIS Spelling Subtest

NAME	SCHOOL	PA1	PA2	SP1RAW	SP2RAW	COMPOS	GROUP	TRIAD
IESHA	MARY	3	2	1	9	72	C	2
MECAIL	PAT	5	15	2	9	81	T1	2
GABRIEL	BEN	2	8	4	10	92	T2	2
STEPHA	GREG	14	10	15	14	103	C	3
RACHEL	OLMC	18	20	11	15	98	T1	3
CARRIE	BEN	16	13	8	10	87	T2	3
KARI	PIUS	18	16	4	10	91	C	4
KAITLYN	GREG	16	16	14	15	107	T1	4
MEGHAN	PIUS	16	20	7	10	94	T2	4
FRANCES	PIUS	6	5	9	13	106	C	5
JACKIE	TRIN	9	14	7	6	87	T1	5
HOLLY	TRIN	10	10	8	12	73	T2	5
CHRISTIN	BEN	12	13	9	12	105	C	6
VARNEI	PAT	14	13	12	15	72	T1	6
LAURA	BRIDG	18	20	13	15	98	T2	6
MICHELLE	TRIN	14	15	13	14	107	C	7
JENNIFER	CTK	17	22	3	9	104	T1	7
JESSICA	TRIN	19	15	4	10	86	T2	7
ANDRE	PAT	5	5	2	10	77	C	9
JOSEPH	BEN	3	10	7	9	93	T1	9
TAYLOR	BRIDG	0	12	10	7	81	T2	9
CURTIS	BEN	8	21	4	4	90	C	11
PAUL	BRIDG	10	17	11	14	101	T1	11
ANTHONY	STAR	8	11	7	10	112	T2	11
THOMAS	STAR	16	12	3	10	110	C	14
DAVID	AND	20	22	8	14	95	T1	14
BRANDON	PIUS	15	15	9	13	85	T2	14
JEREMY	MARY	0	1	0	4	78	C	19
JOSHUA	SHEART	0	4	2	7	61	T1	19
TERRY	SHEART	1	5	1	4	70	T2	19
KEVIN	BRIDG	20	20	10	13	108	C	20
TAYLOR	OLL	18	21	11	27		T1	20
BEN	ALLS	14	18	3	9	90	T2	20
NEIL	BRIDG	11	18	9	15	99	C	21
ALEC	STAR	9	17	7	14	108	T1	21
JAMIE	CTK	1	2	3	2	67	T2	21
MARY	GREG	3	12	14	19	97	C	22
CAROLI	OLMC	1	12	6	12	86	T1	22
BRITTANY	SHEART	0	15	0	2	63	T2	22
HANNA	PIUS	5	13	2	12	100	C	24
KIANI	GREG	5	14	4	11	75	T1	24
SHANEQ	MARY	4	8	3	10	62	T2	24

Appendix F

Correspondence

VCU
Virginia Commonwealth University

DIVISION OF TEACHER EDUCATION
OLIVER HALL
[redacted]
RICHMOND, VIRGINIA 23284-2020
[redacted]
FAX: [redacted]
UUU: [redacted]

July 2, 1995

To: The Psychological Corporation

From: Patricia H. Duncan, Ed.D., Dissertation Chair for Ms. Joan Rhodes [redacted]

RE: Authorization to Use the BASIS Test

As dissertation advisor I endorse the use of the Basic Achievement Skills Individual Screener test as the instrument for Joan Rhodes' doctoral research study. The title of Ms. Rhodes' study is, "A Comparison of the Effects of Writing Instruction With and Without Phonemic Segmentation on the Standard Spelling Skill of First Graders in a Reduced Ratio Program.

Ms Rhodes is at the dissertation stage in the PhD program in Urban Leadership at Virginia Commonwealth University and will conduct her research during the 1995-96 academic year.

DIVISION OF TEACHER EDUCATION

OLIVER HALL
[redacted]
P.O. Box 842020
RICHMOND, VIRGINIA 23284-2020

804 828-1305
PROFESSIONS WORK MAIL
[redacted]
FAX [redacted]
TDD [redacted]

January 15, 1997

To Whom It May Concern:

This is to confirm that Ms. Joan Rhodes has approval from her doctoral committee to use the BASIS Spelling Test as a pre-and posttest instrument in her doctoral research. We certify that she will administer and score the test according to standardized procedures.

Sincerely,

[redacted]

Patricia H. Duncan, Ed.D.
Professor of Education
Dissertation Chair

THE
PSYCHOLOGICAL
CORPORATION®

April 9, 1997

Ms. Joan A. Rhodes
Virginia Commonwealth University
Oliver Hall
1015 West Main Street
Richmond, VA 23284

Dear Ms. Rhodes:

Thank you for your fax regarding your use of the Basic Achievement Skills Individual Screener (BASIS) in your dissertation research on how the use of the Elkonin analysis phonemic segmentation method effects the growth of first grade students' over a 12-week period.

As a responsible test publisher, we believe it is our duty to protect the security and integrity of our test instruments. Therefore, we cannot allow copies of the test to be included with or stapled in your dissertation. If available, sample items may be included, but actual test items cannot. Also, all testing must be conducted in your presence or that of another qualified individual so that all test materials remain secure.

We will gladly grant permission for the use of this test instrument if the above restrictions will be followed. Please indicate your agreement to these terms by signing and returning this letter for our files. When you have returned the signed letter, you may contact Deborah Brown Joseph in Customer Service at [redacted] to order your test materials. As a student, you are eligible for a 50% discount on these materials; however, you must pay for the order yourself and request the discount at the time you place the order.

Also, please forward a copy of your final dissertation for our library upon completion.

Thank you for your interest in our test materials. If you have further questions or needs, please contact us. Good luck with your research.

Sincerely,

[redacted]

Linda Murphy
Rights and Permissions Specialist
Legal Affairs

AGREED:

[redacted]

VCU
Virginia Commonwealth University

Division of Teacher Education
Oliver Hall
1015 West Main Street
Richmond, Virginia 23220-08
P.O. Box 842020
Richmond, Virginia 23284-2020

(80[redacted]
Professors Voice Mail
[redacted]

February 14, 1997

To: Riverside Publishing Co.

From: Patricia H. Duncan, Ed.D. [redacted]
Graduate Advisor for Joan Rhodes

Re: Use of the COGAT in Dissertation Research

This is to certify that Joan Rhodes has the permission of her Doctoral Dissertation Committee to use the COGAT in her research. Ms. Rhodes will use the instrument according to Standardized procedures stipulated by the test.

NonPublic Educational Services, Inc.

January 10, 1997

Dear Parents and Guardians,

Title I has been asked to participate in a study to determine if using a specific teaching technique helps improve our students' reading and spelling skills. The study is being conducted by Joan Rhoades, a doctoral candidate in the Reading Studies Department of Virginia Commonwealth University. Randomly selected students will receive 5 minutes of individual instruction twice a week for 12 weeks.

Your child has been selected to be a part of this study. If you have any questions or concerns regarding his/her participation, you should contact your Title I teacher immediately.

We are excited about being a part of this study as the information gathered will contribute to the body of knowledge concerning effective ways to teach students.

Sincerely,

[redacted]

Ann Martin
Project Director
Title I Bypass

NonPublic Educational Services, Inc.

January 10, 1997

Sr. Rose Marie Adams, Principal
St. Gregory the Great School
[redacted]

Dear Sr. Rose Marie,

Title I has been asked to participate in a study conducted by Joan Rhoades, a doctoral candidate in the Reading Studies Department of Virginia Commonwealth University. Mrs. Rhoades' study will determine if using a specific teaching technique to hear sounds in words improves the reading and spelling skills of participating first grade students. This technique is used throughout the country as part of Reading Recovery and is an opportunity for children to develop their phonic skills. Randomly selected students will receive 3-5 minutes of individual instruction by the Title I teacher twice a week for 12 weeks. These children will be identified by a number and the information gathered will not be used for placement purposes. At the end of the study we will be glad to share the findings with you.

We are excited about being a part of this study as the information gathered will contribute to the body of knowledge concerning effective teaching methods. The Title I teacher will send a letter home to parents of selected students.

If you have any questions or concerns regarding participation of first grade Title I students at your school, please contact me immediately at [redacted].

Our Title I teachers have received a one day inservice regarding our participation in this study. We hope to begin the study very soon, beginning with a brief pre-test administered by Mrs. Rhoades.

Thank you in advance for your willingness to be a part of this effort.

Sincerely,

Ann Martin
Project Director
Title I Bypass

Vita