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THE EFFECTIVENESS OF A WORD BOX INSTRUCTIONAL APPROACH ON
WORD IDENTIFICATION AND SPELLING PERFORMANCE FOR A SAMPLE OF
STUDENTS WITH LEARNING DISABILITIES

DISSertation

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate School for
The Ohio State University

By
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ABSTRACT

The purpose of the current study was to examine the effectiveness of Clay's word box instructional approach on word identification and spelling performance for a sample of students with learning disabilities. A multiple-baseline design across subjects was used to evaluate changes in performance during baseline, instruction, maintenance, and transfer conditions of the study. Results revealed that all subjects demonstrated improvement in both level and trend when Clay's word box instructional approach was implemented. Maintenance data revealed that all subjects maintained word identification skills one month after intervention had ended. Subjects' data obtained during transfer conditions revealed that skills learned in one context were transferred to another context one month after the word boxes instructional approach had ended.

The word box instructional approach is one of the approaches that is used in Reading Recovery programs for first-grade children. Findings of the current study suggested that this and possibly other Reading Recovery approaches have the potential to benefit older elementary students who are receiving educational services in programs.
for students with learning disabilities. Future studies are needed to compare ongoing changes in students' performance with the use of the word box instructional approach to ongoing changes in students' performance with the use of other approaches that are aimed at helping children with learning disabilities map speech onto print.
This dissertation is dedicated to the following individuals:

My parents, Dr. Ellis and Guitta Joseph

My brother, Ellis Joseph, Jr.

My sister, Paula Joseph
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CHAPTER 1

INTRODUCTION

Over the past decade, there has been some debate over the whole language versus phonics instruction approach to teaching reading skills. Several researchers have substantiated that many children with learning disabilities do not learn the alphabetic code (sounds and their letter equivalents) on their own but instead need structured lessons in which skills are directly taught (Adams & Bruck, 1995; Pressley & Rankin, 1994). According to Anderson, Hiebert, Scott, & Wilkinson (1985), the question is not should phonological coding and word identification be taught but rather how could they be taught quickly and easily? Further research is needed to determine what word decoding instructional approaches prove to be effective for teaching students with learning disabilities to make sound symbol associations while reading and spelling words.

Within the field of reading, Marie Clay (1991) has been particularly instrumental in developing instructional approaches that facilitated the linkages between oral and written language. Specifically, she discussed how becoming literate or mapping speech onto print involved mutisensory
processes (auditory, visual, and kinesthetic), and her instructional approaches encourage the use of these senses.

Clay (1991) is well known for her development of a reading program called Reading Recovery. Reading Recovery programs are designed to provide individual instruction to children who are functioning at the lowest level in their first grade class. Assessment begins with all first grade children at the onset of the school year. Children who score the lowest on assessment measures are chosen to participate in the program. The goal of the program is to bring the children who are experiencing reading difficulty up to the class average as quickly as possible. This is achieved by means of accelerated learning and holistic instruction. Specifically, each student in the reading recovery program is engaged in an extensive amount of writing and reading through intensive one-to-one instruction that occurs thirty minutes every day. According to Boehnlein (1991), early intervention and intensive teacher training are stressed in this program.

Reading Recovery lessons consist of familiar reading, use of running records, writing, new book introduction, and first reading. Familiar reading involves providing students with familiar materials so that they develop fluency and phrasing. Students are taught to hear sounds in words and generate other words. Conditions are provided for children to gain experience in becoming fluent with known words. One of the Reading Recovery approaches that is used when children demonstrate difficulty mapping speech onto print is a word
box instructional approach which was initially developed by D.B. Elkonin (1963). According to Deford (1991), reports have indicated that 85 percent of children in Reading Recovery reach an average range of performance in reading and writing within twelve to fifteen weeks.

Reading Recovery with its many instructional components has been empirically examined with first-grade children who are at risk of failing to read. In New Zealand, Clay (1979) conducted the first study to examine the program's effects on children's reading performance. She studied 122 children from diverse schools in Reading Recovery programs and compared them with their classmates. Children who participated in her study were given a pretest and a posttest. These tests consisted of reading vocabulary, concepts about print, writing vocabulary, dictation ability, and letter identification.

Teachers systematically observed the children and kept running records on their progress. They recorded the second reading of every new book that was introduced. From these records, reading miscues and summaries of the strategies that children used as they read were analyzed. Teachers' records were filled with children's responses to reading and writing tasks. Graphs were constructed to show the trend in students' progress on increasingly difficult text material. Out of 122 students, 80 students returned to the regular classroom for reading instruction after approximately thirteen weeks of Reading Recovery instruction. Therefore,
the children studied had reached performance levels that were comparable to their average-achieving classmates. Some of the children who received the Reading Recovery program demonstrated higher levels of performance than their typical peers in the regular classroom. Additionally, the Reading Recovery teachers indicated that the students were able to maintain average levels of functioning without any special tutoring. Seven children did not show much progress from the program. Of these seven children, four did not speak English, and two were suspected of having mental limitations.

Ohio was the first state in the United States to implement Reading Recovery programs. A replication of Clay's (1979) study was conducted by Huck and Pinnell (1985) with six inner city schools over a year. Their sample was comprised of 70 at risk students as well as control classrooms of at risk students. The at risk students were compared to their classmates and to students in the control classrooms. They administered pretests and posttests that were similar to those used in Clay's (1979) study, but they also included the reading subtests from the Stanford Achievement Test. Results revealed that a substantial number of students were able to return to their regular classroom. The Reading Recovery students in this study outperformed their control group of at risk children. Additionally, some students performed significantly higher than some of their average-achieving peers. The Reading Recovery students made gains in reading comprehension, word reading, letter
identification, reading level, word study skills, and concepts about print. Their Stanford Achievement Test scores also revealed gains in performance. The investigators concluded that their findings supported Clay's previous findings. Since the time of this study, many other schools in Ohio have incorporated Reading Recovery programs.

Reading Recovery has been compared to other instructional approaches and studied with special populations. For instance, Pinnell, Lyons, & Deford (1991) found that Reading Recovery, compared to other instructional approaches, had the most lasting treatment effects on student reading performance. Lyon's (1989) examined the effects of Reading Recovery for a group of first grade children with learning disabilities. She found that the first grade children with learning disabilities achieved at about the same level as their nondisabled peers as a result of Reading Recovery instruction. Reading Recovery has also been studied when explicit phonemic awareness instruction was added to the program. Iversen and Tummer (1993) compared children who received a standard Reading Recovery program to those who received a Reading Recovery program with explicit phonemic awareness instruction. They found that children who received a Reading Recovery program with explicit phonemic awareness instruction progressed in their phonemic awareness, reading, and spelling skills much quicker than children who received the Reading Recovery program only. It should be noted, however, that the Reading Recovery program itself includes
lessons on direct phonemic awareness instruction such as Clay's word box instructional approach. It is unclear from the previously mentioned study whether the word box approach was used in an explicit, systematic manner in which Marie Clay had intended it to be during the standard Reading Recovery condition.

Purpose of the Current Study

All of the previous studies on the effects of Reading Recovery utilized multiple instructional lessons on student performance of multiple reading skills (i.e., word identification, reading vocabulary, connected text reading, and reading comprehension). The purpose of the current study was to study the effectiveness of one of the Reading Recovery instructional lessons that purports to improve specific reading and spelling skills. Due to the fact that research has repeatedly substantiated the effectiveness of phonemic awareness instruction on later success in reading (Ball & Blachman, 1991; Bradley & Bryant, 1985), Clay's (1993) adaptation of Elkonin's (1963) word box instructional approach, which encourages children to map phonemes (sounds) onto graphemes (printed letters), was used in the present study to teach a group of children with learning disabilities word identification and spelling skills. Marie Clay's word box instructional approach is one of the instructional approaches that is a component of the entire Reading Recovery program.
An adaptation of Elkonin's (1963) word box instructional approach has also been used along with other phonemic awareness tasks to study the effectiveness of phonemic awareness instruction on young children's beginning reading performance. For instance, Ball and Blachman (1991) studied the effects of phonemic segmentation training and letter name and letter sound instruction on kindergarten children's reading and spelling skills. Their sample was comprised of ninety children who were randomly assigned to one of three groups. The first group participated in a condition which provided training in phoneme awareness combined with phoneme segmentation (word boxes). The second group received training in letter names and letter sounds (language activities). The third group received no intervention. Results indicated that children who received the phoneme awareness instruction combined with phoneme segmentation training improved significantly on early reading and spelling skills. Significant effects on early reading and spelling performance were not evident for children who received instruction in letter names and letter sounds alone. Similarly, the children who did not receive any intervention did not demonstrate improvement on early reading and spelling skills.

The current study is unique because its goal is to study the effectiveness of a word box instructional approach in isolation unlike the previous studies described which have used this approach in combination with other Reading Recovery
and phonemic awareness instructional activities. Another unique feature of this study consists of examining the effects of this approach on word identification and spelling performance of second grade, third grade, and fourth grade children who have been identified as learning disabled in basic reading skills. Studies that were previously described have consisted of samples comprised of kindergarten and first grade children. Lastly, the present study utilized single subject research design methods to more closely study students' trends or changes in performance on word identification and spelling skills as a function of the word box instructional approach. This is unlike the previous studies mentioned which have employed large group experimental research designs to study the effects of a word box instructional approach in combination with other instructional approaches on reading and spelling performance. According to McCormick (1995), single-subject design methodology allows the researcher to view ongoing as well as quantifiable changes in performance during the instructional process rather than only at the completion of treatment conditions (e.g., as is the case with pretest-posttest designs).
Research Questions

The implementation of this study was guided by the following questions.

1. Will pupils reach a specified accuracy criterion on word identification as a function of Clay's (1993) word box instructional approach?

2. Will pupils reach a specified accuracy criterion on spelling words as a function of Clay's (1993) word box instructional approach?

3. Will word identification skills acquired when using Clay's (1993) word box instructional approach be maintained at least one month after the instruction ended?

4. Will spelling skills acquired when using Clay's (1993) word box instructional approach be maintained at least one month after the instruction ended?

5. Will word identification skills acquired be transferred to another context after instruction had ended?

6. Will spelling skills acquired be transferred to another context after instruction ended?

7. Are teacher-made quizzes and Clay's (1993) word box instructional approach a socially valid way to assess and teach word identification and spelling to pupils who have been identified as learning disabled in basic reading skills?
Initially, this chapter will provide an overview of what constitutes an effective reader in contrast to those who are disabled in reading. The next section will provide a brief discussion of whole-language instructional approaches to reading and their limitations for instructing individuals with learning disabilities. Next, a code-emphasis approach to instruction that is supported by research is discussed in terms of its outcomes for individuals who are at risk of reading failure. This chapter will conclude with a discussion of the use of word boxes as a specific instructional approach for helping children who have a limited grasp of mapping speech onto print.

Introduction

Inventions of language and a search for language patterns are involved in learning to talk, read, and write. One of the most complex processes of language that human beings encounter is learning to read and write. Individuals with learning disabilities in the area of reading particularly find it challenging to grasp even the most elementary components of the reading and writing process (Richeck, Caldwell, Jennings, & Lerner, 1996). According to
Anderson, Hiebert, Scott, and Wilkinson (1985), there are five attributes that make up an effective reader. One attribute is that reading must be fluent which means recognizing words quickly and easily. Once readers become efficient at "breaking sound to letter codes", they can expend more of their "cognitive energies" toward deriving meaning from printed text (Stanovich, 1991). Another attribute is the notion that reading is a constructive process. Readers draw upon their own background knowledge and experiences (schema) to construct meaning of written passages. According to Richeck et al.,(1996), children with learning disabilities may need much guidance from their teacher in building their background knowledge which includes their vocabulary.

Research has supported the importance of background knowledge including early language and literacy experiences to later reading success. For instance, in an early study, Nino and Bruner (1978) found that children's language and reading was enhanced if mother's dialogues with their children during picture book reading included asking questions, labeling objects or events, and providing feedback by repeating or extending upon their children's remarks. Thomas (1985) compared early readers to nonearly readers and found that literacy was talked about more often in families of early readers. His finding also revealed that interchanges between parents and early readers consisted of guided thinking about the information contained in stories.
Similarly, Well's (1985) found that a child's early knowledge of the aspects of literacy had the highest correlation with reading attainment. He administered tests to children upon entry to school and administered parent-questionnaires to find out about children's early literacy experiences. The early literacy experiences included the number of books owned by the child and other activities associated with literacy. Two years later, he reassessed the children and revealed a significant positive correlation among these variables of interest. This study supported an earlier one conducted by Chomsky (1972) who found that kindergarten children who had been exposed to many books prior to school entry understood more complex linguistic and language systems. Sulzby (1985) found that story reading constructs are formed prior to an ability to read and attend to print. She studied kindergarten children, as well as children ages two, three, and four, and discovered a developmental progression across age levels. The young children in her study used a structure that represented oral speech when forming their stories as they pretended to read printed text. Older children used written-language-like structures as they read printed text.

Effective readers have also been known to be strategic while engaged in the reading process unlike many learning disabled readers who have not learned to regulate, monitor, or verify their approaches to a reading task (Anderson et al., 1985). Motivation and the lifelong pursuit of reading are other attributes that most effective readers have. This
means that skillful readers perceive reading as a lifelong developing process and exercise much sustained attention in order to gain the most knowledge from printed text. It is evident from this discussion that individuals with learning disabilities may need a balance of whole-language and code-emphasis instruction (Pressley & Rankin, 1994).

**Whole Language Philosophy**

Emergent literacy, a phrase coined by Clay (1991), denotes the process of becoming literate through the interrelated activities of oral language, reading, and writing in young children. Whole language approaches to reading encompasses the processes of oral and written language as an integrated system. The link between oral language and reading has been evident in research that has examined the relationships between children's difficulty with complex syntactic structures and the morphology of spoken language and their difficulty with reading (Moats, 1994; Stanovich, 1994; Wiig & Semel, 1984). Whole language approaches stress the use of authentic reading materials for understanding the linkages between oral and written language. Whole language approaches typically demphasize breaking language apart into its component parts (Stahl & Kuhn, 1995). Often invented spellings of words are permitted in children's written work.

In classrooms where a whole-language approach is implemented, children as young as kindergartners begin to engage in writing experiences before they even learn to read.
According to Clay (1991), the functions of reading and writing influence each other when they are taught simultaneously. She discussed four strategies which young writers use, and they are the recurring principle, the generative principle, the sign principle, and the inventory principle. Children establish a recurring principle when they grasp pattern regularity in English. Children might initially fill a line with scribbles that resemble each other. Children apply a generative principle when they create unique messages with a limited set of letters and words. They repeat letters and words in different combinations. For example, children may write "I like Mom" and then write "I like Dad." Children make the connection between the concrete object and the abstract word when they are said to grasp the sign principle. The inventory principle is used when children list words that they know. Often, this results in written statements that may include unrelated words. Juel (1995) contended that children who have oral language and beginning writing problems will need more direct guidance in writing stories than their typical developing classmates.

Whole language approaches to reading have been particularly criticized in regard to helping children with learning disabilities become better readers (Stahl & Kuhn, 1995). It has been criticized mainly for its lack of emphasis on direct instruction of word decoding skills. Many whole language philosophers maintain that the sound-symbol
relationships of the printed language will be mastered naturally and incidentally as children learn to read and write through meaningful instructional materials (Goodman, 1986).

According to Stahl and Kuhn (1995), most whole-language research has employed qualitative methods consisting of triangulation of data and researcher’s observations. Much research on whole language approaches are said to be no more than testimonials provided by teachers (McKenna, Stahl, & Reinking, 1994). However, some studies have provided some strengths to using whole language approaches. For instance, through a meta-analysis, Stahl and Miller (1989) found that whole language approaches were particularly helpful for developing kindergarten children’s concepts about print. These findings were consistent with an updated meta-analysis of whole language studies (Stahl, McKenna, & Pagnucco, 1994). For the learning disabled reader, many have agreed that reading skills are learned best when they are taught in a direct, structured, systematic fashion (Adams & Bruck, 1995; Pressley & Rankin, 1994; Mather, 1992; Liberman & Liberman, 1990; Chall, 1991; Stahl & Miller, 1989).

**Code-Emphasis Instruction**

The systems of speech sounds in language is referred to as phonology, and phonemic awareness involves an alertness to the patterns of speech sounds (Chall, 1991). The smallest unit of sound is a phoneme. Phonemes are isolated sounds but when put together can form words. Alphabetic understanding
involves linking sounds to their written letter symbols of language. Written letter symbols of language are called graphemes. Standard English is based on the alphabetic principle in which letters and clusters of letters represent the sounds of spoken language (Williams, 1991). Adams (1990) stated that the relationship between phonemic awareness and alphabetic understanding are closely linked, and the awareness of the phonological system permits children to enter into the alphabetic system. A child is able to figure out plausible pronunciations of printed words once he or she is able to learn mappings of speech to print (Juel, 1995). The process of phonological recoding occurs as the child looks at the letters in words and recodes them into their sounds. Orthographic processing is the ability to process the visual pattern of written language as it relates to phonological, graphemic, and semantic features of the language. In other words, it refers to the awareness of the sequential patterns of letters in written words (Henderson, 1984). Many children with learning disabilities are unaware of the relationships of speech and print patterns. Many of these children demonstrate difficulty in recognizing that the word "can," for example, contains three distinctive sounds, and these children are also unable to count the phonemic segments in words (Liberman & Liberman, 1990).
Evidence of the Relationship between Phonemic Awareness, Alphabetic Knowledge, Word Identification, and Spelling.

Explicit instruction of phonemic awareness has increasingly gain support due to significant research findings. For instance, rather recently, Stanovich and Siegal (1994) studied the possible contribution of several variables on poor word recognition performance among populations with a reading disability. They found that phonological processes were the main variables that contributed to poor word recognition performance. One of their critical findings was that much of the variance in performance on word recognition measures was explained by phonological variables rather than performance on intelligence measures. The researchers concluded that the aptitude/achievement discrepancy model was unrelated to the unique component processes associated with word recognition performance for a sample of students with reading disabilities. In other studies that compared children with reading disabilities and children without reading disabilities, findings supported that phonological processes rather than performance on intelligence measures were the main variables that contributed to poor word recognition performance (Fletcher et al., 1994; Swank and Catts, 1994).

Meta-analytic studies have also been conducted on how children acquire literacy. For instance, through their meta-analysis of research findings on literacy acquisition, Goetz, Parsons, and Wilson (1992) found that phonemic awareness...
played a central role in the early stages. Longitudinal studies have also showed positive effects of explicit phonemic awareness instruction on later reading skills. Bradley & Bryant (1983; 1985) conducted a longitudinal study on the effects of early explicit phonemic awareness instruction with the use of rhymes and alliteration on future reading and spelling performance. Their study was comprised of a large sample of four-year old children who were evaluated approximately over a four year time period. Specifically, the preschool children studied were selected to participate in one of four conditions. One group of subjects was taught to think about how the names of pictured objects shared phonemes. A second group was taught how to use pictures and letters to relate sound to print. A third group was trained to associate objects by meaning. A control group received no specialized training.

The researchers found that children in the first and second groups outperformed the latter two groups on reading and spelling tasks 4 years later. Children who received sound to print training in preschool were the most successful. Findings revealed a strong relationship between children's early awareness of phonemes and their later reading and spelling performance. These findings were similar to more recent findings from longitudinal studies (Bryant, MacLean, Bradley, and Crossland, 1990; Kirtley, Bryant, MacLean, & Bradley, 1989).
The following study combined training of phonemic awareness with alphabetic knowledge to study its effects on word identification and spelling performance. For example, Bentin and Lesham (1993) studied the effects of phonemic segmentation combined with letter shape training on kindergarten children's acquisition of beginning reading skills. Children were randomly assigned to one of four experimental conditions. One group was provided with phoneme segmentation training that involved categorizing objects by their first or last phoneme. The second group was provided with phoneme segmentation combined with letter shape instruction. This group was trained in a similar fashion to the first group but was exposed to the shape of the letters that represented the phonemic segments. The third group received general language skills instruction which consisted of comprehension of spoken sentences (semantics) and sentence structure (syntax). The fourth group received no special training meaning that the children in this group only received traditional kindergarten curricular activities.

Groups one and two improved significantly on their phonological awareness skills. Groups three and four showed no significant improvement on phonological awareness skills. Nine months later, reading test scores revealed that students who were trained on phonemic segmentation tasks and students who were trained on phonemic segmentation tasks combined with letter shapes performed similarly on the reading tests. These groups outperformed the other two groups who did not
receive explicit phonemic awareness instruction in kindergarten. The investigators concluded that their study supported previous findings of the positive effects of phoneme segmentation on early reading acquisition skills. Perfetti (1985) also emphasized the importance of teaching children to discriminate between shapes of words and letters through his review of studies.

Other studies examined the effects of the combination of phonemic awareness instruction and alphabetic knowledge on word identification and spelling skills. Specifically, Bryne and Fielding-Barnsley (1993) evaluated a program for teaching preschool children about phonemic structure. The program involved teaching children that different words can begin and end with the same sound. Pictures were used, and they entailed many objects beginning with the same sound as well as many objects ending with the same sound. A kit was filled with games, worksheets, and audio tapes which was used to teach the concept of sound sharing among words. Their sample was comprised of 64 preschool children who participated in the training program and 62 preschool children who were part of a control group that did not receive instruction on phoneme identity.

Results indicated that the children who received the training program about phonemic structure performed at higher levels on word identification, pseudoword reading, and spelling than children who did not receive the training. Through further inspection of the data, the researchers
discovered that pseudowords were only read by the subjects who understood the alphabetic principle. They concluded from these findings that phonemic awareness combined with alphabetic knowledge contributed to word decoding and spelling skills. Foorman, Jenkins, and Francis (1993) found that children were more likely to read and spell words if they were also able to segment words phonemically. Children in their study had the most difficulty segmenting medial sounds and initial sounds that contained consonant blends. Essentially, these children had difficulty with producing a word that contained a phonologically complex unit such as a blend.

The use of analogies has also been studied in relation to the processes of mapping sounds onto print (word decoding). Ehri & Robbins (1992) hypothesized that decoding skills were related to reading words by analogy. Their subjects consisted of kindergarten and first grade students. Results indicated that children who could decode words were able to read an unknown word based on known word analogies. The students who had decoding skills were also able to spell words that were new to them. In their study, Nondecoders rarely read any words by analogy. The researchers concluded that beginning readers may be able to make inferences about a new word if they acquire some letter sound analytic skills at the outset. This helps them understand how letters symbolize sounds and how to blend parts of known words with parts of new words.
Goswami and Mead (1992) studied the extent to which children can use analogies between spelling patterns in words to help them make inferences about the sounds of new words sharing similar patterns. Their sample was comprised of 44 children who were six and seven years of age. Word ending and beginning analogies as well as an oddity test was used. Phonological awareness tasks were also used. Additionally, reading and vocabulary level were assessed. Results indicated that inferences were easily made with word ending analogies than with word beginning analogies. Levels of phonological awareness were related to inferences made with beginning analogies. Good readers made more analogies than poor readers. The researchers concluded that word ending analogies were easier because rhyming develops earlier than the phonological awareness skills needed for making word beginning analogies.

There has been some evidence which suggested a developmental progression of phonemic awareness skills. Through a review of several studies, Mann (1991) found that children at the age of four were able to count syllables but not the phonemes in words presented orally. He found that 50 percent of children at the age of five could count syllables, and 20 percent could count phonemes in words presented orally. At the age of six, 90 percent of the children by the end of first grade could count syllables, and 70 percent could count phonemes in words presented orally. Even though phoneme and syllable counting do not typically occur until
about the age of four, studies have provided evidence that other phonemic awareness skills of rhyming and deletion have been evident in children at the age of three (Bryant, MacLean, & Crossland, 1990).

Some studies have compared context-based instruction and code-based instruction on students' reading performance. For instance, Brown and Felton (1990) randomly assigned first and second-grade children who were identified as at risk of reading failure to a context based instruction or a code based instruction group. Phoneme segmentation, sequencing, and sound-symbol relations were taught in the code-based instruction group. Reading and spelling material that coordinated with the code instruction was provided. Meaning with context and picture cues were used to teach word identification skills in the context-based instruction group.

Children who participated in the code condition outperformed children who participated in the context-based condition on reading and spelling measures that were administered at the end of their first-and second-grade school year. In the code condition, all children regardless of their phonological awareness deficiencies understood the application of the alphabetic principle to reading words, particularly multisyllabic words, by the end of the second grade. Children who received a context based instruction failed to grasp sound-symbol relations.

Reading and spelling words are said to be interdependent (Gough, Juel, & Griffith, 1992). Foreman and Francis (1994)
found that first-grade children's correct spellings almost always were accompanied by correct reading of words. Integration of spelling and reading instruction has resulted in a developmental shift of how these two skills are viewed (Gaswomi and Bryant, 1990). Frith (1985) suggested that the stages of beginning reading were logographic to alphabetic to orthographic, whereas spelling begins with the alphabetic stage. According to Treiman (1993), children use a letter-name strategy during the early stages of learning to spell. Children then progress to a "vowel transition" stage in which long vowel sounds are represented by doubling the vowel in the middle of the word. Morpho-phonemic skills which includes knowledge of the meaning and origin of words is considered the final stage in learning to spell.

**Reading Words with Automaticity**

Automaticity refers to decoding words with accuracy and fluency (Juel, 1991). Clay (1991) implied that reading with automaticity may begin to occur if children know where to attend, understand the sequence of written language, and know how to pick up information perceptually. Initially, children may go through a trial and error process of coding words. As children's experiences with words increases, they will find that word identification becomes less demanding. Stanovich (1994) stated that decoding words with automaticity activates a word's meaning. Furthermore, he stated that children need to eventually read words with automaticity because the time and attention that it takes to identify words places many
demands on processing the meaning of a sentence. Therefore, children who have word identification deficiencies may fail to comprehend due to underdeveloped decoding skills rather than an overreliance on decoding (Stahl, 1992).

Research studies have examined the process of automaticity in reading skills. For instance, Stahl and Heubach (1993) studied a group of second-grade children who were reading approximately at the primer level. A classroom-based approach in which the volume of children's reading was increased through repeated readings, partner reading, reading at home, and periods of sustained silent reading produced positive results. The students were reading at grade level by the end of the school year.

Vygotsky's (1987) theory on child development focused on the important role of social interchanges between the adult and the child as a way to mediate a child's thinking and speech. Carnine, Silbert, and Kameenui (1990) discussed a mediated or scaffolding approach to help children eventually read with automaticity. Scaffolds provide the learner with support and guidance during the initial phases of learning new and difficult information. Task scaffolds are embedded in the tasks themselves. They are designed to allow students to focus on the reading process with much ease by reducing the information that must be generated independently.

A scaffolding approach to teaching initial letter-sound correspondences might entail the teacher pointing to each letter in a word while the student says the sounds. Next,
students would say the sounds of each letter in a word aloud without teacher assistance. The students would then say the word fast. Finally, the students would say each letter covertly and then say the word fast. These successive tasks lead to associating sounds with letters in whole words. Student errors may be limited as a result of employing a scaffolding approach. Scaffolds should gradually be reduced so that students do not over rely on the instructor. The level of guidance and support should be in accordance with the learner's needs. Carnine, Silbert & Kameenui (1990) illustrated this through a blending task to facilitate word identification. An auditory blending activity was used in which the teacher directed students to switch from sound to sound without pausing between each sound as students articulated a series of sounds. The teacher pointed to letters as students said the sounds in alphabetic blending tasks.

Fluency in reading words comes as a result of frequent opportunities to practice. Dempster (1991) discussed allowing time for children to practice and review their beginning reading skills. Review activities should be scheduled and should include letter sounds and spelling patterns in spoken and written language. Documentation should occur to provide the teacher with information about what should be reviewed in the near future.
Word Box Instructional Approach

Before fluency in reading occurs, instructional tasks that are designed to explicitly bridge phonemic awareness to word identification and spelling, such as those already discussed, need to be implemented. For the purposes of the current study, the word box instructional approach for helping children with learning disabilities map phonemes to alphabetic codes as well as spell words will be discussed. The detailing steps of this approach is discussed in the methodology chapter. This section provides an overall rationale for the use of this approach.

D.B. Elkonin, a Russian psychologist who spent a great deal of time studying the psychology of preschool children, developed what he referred to as sound boxes to teach children phoneme segmentation. Through his observations of several children, he found the sound box approach for teaching children phoneme segmentation to be better than some of the other methods that he studied (Elkonin, 1963).

Essentially, sound boxes involve a drawn rectangle that is divided into the number of phonemes in a word. Often, the divided rectangle is accompanied with a picture of the word. Upon presentation of this stimulus, a child is asked to say the word slowly and place a counter in each square as each sound is articulated. Clay (1993) has more recently adapted this approach to include an intermediate step in which the child is not only taught phonemic awareness but is also taught phonological recoding and spelling skills.
Clay's adaptation of Elkonin's boxes is designed to integrate oral language, reading, and written language skills. This integration of the language system through her adaptation of Elkonin's word boxes may prove to be especially helpful since there has been rather current discussion on combining whole language with a code-emphasis approach while instructing the learning disabled reader (Pressley & Rankin, 1994; Mather, 1991). The oral language component to her word box instructional approach is very similar to phoneme segmentation with Elkonin's sound boxes. Clay (1993) especially encouraged the use of words that were already a part of the child's speaking vocabulary. The word identification (reading words) component to her word box instructional approach incorporates the use of magnetic letters instead of counters to be placed in the empty divided boxes. Clay (1993) recognized the interdependency on reading and spelling words and therefore incorporated the teaching of spelling words within her word box instructional approach. Spelling skills are taught by having the child eventually write the letters of words in the divided boxes.

Clay (1991) incorporated additional components to the phonemic awareness component to help children map speech onto print while perceiving words as made up of individual parts. To be able to differentiate words such as, "house" and "horse", children must be attentive to and be able to differentiate sound as well as letter details. Other words may be easily recognized by sight which would require
children's ability to perceive the whole. Clay (1991) stated that young children visually scan pictures in any direction they choose. When they enter school, they soon learn that there is a set of directions for proceeding across a page of printed symbols. Each letter within a word is sequenced from left to right. Specifically, "the child must learn to go from a top-left position after a downward movement and again go across to the right" (Clay, 1991, p. 95). Therefore, attention and serial order processes play an important role when children are making one-to-one correspondences with letters and words (Ehri, 1991).

According to Rayner (1993), skilled readers process every letter in a word. Clay's (1993) word box instructional approach provides structured conditions for children to grasp the serial order of sounds in words and make better one-to-one correspondences. Her word box approach demands that the child focus upon each sound and each letter in a word. In addition, her approach employs a mediated scaffolding component in which the teacher models the task at the elementary stages as well as at intermediate stages, shares the task with the student, and eventually allows the student to complete the entire task independently.
CHAPTER 3

METHODOLOGY

This chapter describes the methodology of the study. Included are descriptions of the participants, the setting, the experimenter, the instructional approach, definition and measurement of the dependent variables, reliability measurement of the data, and social validity measurement of the instructional approach. Materials, experimental design, and experimental procedures are described.

Participants

Subjects who were selected to participate in this study consisted of three second-grade children, two third-grade children, and one fourth-grade student who had been placed in a special education classroom for specific reading difficulties. All subjects were males with ages ranging from 7 years, nine months to 10 years, two months with a mean age of 9 years, 8 months. Socioeconomic status of the families of the six children who participated in this study was middle class. All six subjects were identified as children with learning disabilities according to the Ohio Rules For the Education of Handicapped Children. All six students were selected for the present study due to their low levels of
performance on phonemic awareness, basic word identification, and basic spelling skills. Data indicating low performances in these areas were obtained from standardized instruments as well as the clinical judgment of their school psychologist and special education teacher. Table 1 provides a detailed description of each subject by age, grade, cognitive processing test scores, phonological awareness test scores, letter/word identification test scores, pseudoword naming test scores, and spelling test scores.

The subjects were also selected to participate in this study due their low performances on similar types of high frequency words missed through information obtained from their learning disabilities teacher as well as informal evaluations of their word identification and spelling skills. Specifically, the students in this study had difficulty identifying and spelling high frequency words in which every letter in a word represented a sound that could be heard in spoken language (e.g., cat, mud, hut, scrap, grim). The subject identification procedures were conducted to establish a relatively homogeneous group who were functioning at very similar levels on word identification and spelling skills.

Written parent permission was obtained through six individual formal meetings with each of the six participants' parents and the experimenter. The individual formal meetings consisted of an explanation of the purpose of the study, the credentials of the experimenter, issues of confidentiality,
and the reporting of results. During the formal meetings, all parents received a cover letter explaining the nature of the study as well as a consent form for permitting their child to participate in the study. The specifics of the instructional approach used in the study were not discussed to eliminate the possibility of extraneous variable effects. All parents were informed that the specifics of the instructional approach would be provided to them as well as their child’s results upon completion of the study. Teachers were also informed that the instructional approach used in the study and students’ results would be shared upon completion of the study.

Setting

The experiment was conducted in a small classroom at Rosehill Elementary School in the Reynoldsburg School District. The furniture in the room consisted of a desk, filing cabinets, book shelves with books and materials in them, a rectangular table and two chairs. The lighting in the room consisted of incandescent fixtures at a level appropriate for reading.

Experimenter

The experimenter was a female, doctoral candidate in the School Psychology program with a specialization in the area of reading at The Ohio State University. Sufficient teacher and school psychology training was evident as this experimenter had obtained certifications as a school
psychologist, a teacher of regular elementary (grades 1-8) with a reading validation, learning disabilities (grades K-12), serious emotional disorders (grades K-12), developmentally handicapped (grades K-12) and multiple handicapped (grades K-12). Currently, the experimenter works as a supervisor in the reading clinic for the School of Teaching and Learning in the College of Education at The Ohio State University.

In this study, the experimenter administered, scored, and interpreted all standardized assessments. The experimenter also administered, scored, and interpreted word identification and spelling probes during baseline, instruction, maintenance, and transfer phases of the study. Independent observers (described in further detail in a subsequent section of this document) were also used to score word identification and spelling probes during baseline, instruction, maintenance, and transfer phases of the study. The instructional approach that was used in this study was implemented by the experimenter.

Assessment Tools

Standardized Norm-referenced Instruments Used

Standardized instruments used to initially establish cognitive processing, phonological awareness, word identification, and spelling levels included the Kaufman Assessment Battery For Children (KABC) (Kaufman & Kaufman, 1983), Test of Phonological Awareness (Torgesen & Bryant,
1994), Woodcock-Johnson Psychoeducational Battery-Revised (Woodcock & Johnson, 1990) and the Kaufman Test of Educational Achievement (KTEA) (Kaufman & Kaufman, 1985). All of these measures were administered individually to each of the six participants. The examiner followed standardized procedures that were specified in the respective manuals for administration, scoring, and interpretation. Standard scores which were based on a mean of 100 and a standard deviation of 15 were obtained to provide descriptive information on all six subjects who participated in this study. Table 1 presents this type of descriptive information on all six subjects. Detailed description of the instruments used in this study are subsequently discussed according to the areas in which they measure.

**Cognitive processing** The Kaufman Assessment Battery for Children (KABC) (Kaufman & Kaufman, 1983) is comprised of a Sequential Processing Scale, a Simultaneous Processing Scale and an overall Mental Processing Scale. The Sequential Processing Scale is comprised of various subtests namely, Hand Movements, Number Recall, and Word Order, that measure a child’s ability to process information in a successive, linear manner. Hand Movements required the child to produce a series of hand movements in the order that they were presented by the examiner. Number Recall required the child to repeat a series of numbers in the order in which they were orally presented by the examiner. Word Order was a task
which required the child to listen to the order in which a series of words were orally presented. Afterwards, the child was asked to point to the pictures that represented each word in the order of their oral presentation.

The Simultaneous Processing Scale is comprised of various subtests they measure a child’s ability to process information in a holistic manner, meaning that all parts are surveyable to form a whole. Gestalt Closure, Triangles, Matrix Analogies, Spatial Memory, and Photo Series were among the subtests that made up the Simultaneous Processing Scale. Gestalt Closure required the subject to identify proctors that were presented as an inkblot. Triangles required the subject to arrange triangles to reproduce abstract geometric designs that were presented on cards. Matrix Analogies required the participant to complete a pattern of abstract analogies consisting of concrete pictures and geometric designs. Spatial Memory required the child to remember the positions of where pictures were shown after five minutes had elapsed. Photo Series required the subject to survey pictures that conveyed parts of an event and arrange them in the order of occurrence to complete an entire event.

The Mental Processing Composite is comprised of the Sequential Processing Scale and Simultaneous Processing Scale to assess a child’s overall, general cognitive functioning level. Standard scores are derived for each scale, and they are based on a mean of 100 and a standard deviation of 15.
**Phonological awareness.** Torgesen and Bryant's (1994) Test of Phonological Awareness was used to measure all subjects’ awareness and operation of individual sounds heard in spoken words. This instrument contained a Kindergarten Version and a Early Elementary Version (First and second grades). Both versions were administered to all subjects regardless of their grade levels and chronological ages. One section on the Kindergarten Version consisted of the examiner presenting a stimulus word and four other words orally. The subject was required to identify the word that had the same beginning sound as the stimulus word by marking an “X” on its pictorial representation. The other section consisted of the examiner presenting four words orally, however, this time the subject was required to choose the pictorial representation of the word that had a different beginning sound than the other three. The Elementary Version is similar in form and content to the Kindergarten Version of the test except the subject is required to detect similarities and differences in ending sounds heard in words. Standard scores were derived. Raw scores only were reported for third and fourth grade subjects because standard scores could not be obtained according to the test’s norming procedures.

**Word recognition.** Two subtests from the Woodcock Johnson Psychoeducational Battery-Revised (Woodcock & Johnson, 1990) were used to measure all subjects' word recognition skills. The two subtests were Letter-Word
Identification and Word Attack. Letter-Word Identification measured the individual's performance on recognizing letters and words. Word Attack was a nonsense word task that measured the subjects' performance on decoding words phonetically (i.e., letters (graphemes) and their sound equivalents (phonemes)). An overall Basic Reading Skills composite score was obtained given these two subtests. Standard scores that were based on a mean of 100 and a standard deviation of 15 were obtained.

Spelling. The spelling subtest from the Kaufman Test of Educational Achievement (Kaufman & Kaufman, 1985) was administered to all six subjects to obtain general levels of spelling performance. Standard scores that were based on a mean of 100 and a standard deviation of 15 were obtained.
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<tr>
<th>Descriptive Information</th>
<th>Nate</th>
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<th>Mark</th>
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*Note: Raw scores could only be obtained on the phonological awareness measure for some of the subjects due to lack of appropriate norms.

Table 1
Descriptive Information for the Six Subjects Studied
Word Identification and Spelling Probes

During baseline, instruction, and maintenance phases of the study, word identification and spelling probes that were developed by the experimenter were administered. Only one word identification probe and one spelling probe was administered in every baseline session, every instruction session, and every maintenance session. Word identification probes consisted of a list of 10 words presented in written form on a plain piece of white paper. Spelling probes consisted of a list of 10 words that were presented orally by the examiner. Each word was presented orally one at a time and then a sentence was provided that contained the spelling word followed by a repeated oral presentation of the word in isolation. The subjects were given a plain piece of notebook paper that was numbered from 1 to 10 and they were asked to spell the words after the final repeated oral presentation of a word given in isolation.

Prior to the development of specific probes used for each session, 200 words were placed on cards. The cards were shuffled and mixed up and every tenth word in the stack was chosen to be placed on the probes. This was done separately for word identification and spelling probes so that word identification and spelling probes were not completely identical during any one session. The types of words that were chosen to be placed on cards were high frequency words.
in which each letter in the word represented a sound that could be heard in spoken language. In other words, a word such as "nail" would not be chosen because the /i/ sound can not be heard when this word is presented orally. A word such as split was chosen because the /s/, /p/, /l/, /i/, and /t/ sounds can be heard when this word is presented orally. An independent observer who was a former tutor for students having learning disabilities examined all 200 words and agreed 100 percent with the experimenter that all 200 words contained every letter that represented a sound that could be heard when the word was presented orally.

**Transfer Probes**

Word identification and spelling transfer probes were developed by the experimenter. The word identification transfer probes consisted of words presented within the context of short stories. The Word identification transfer probes consisted of words that were once learned in isolation during the instruction phase of the study.

The spelling probes consisted of 10 dictated sentences that the subject was expected to write. In each dictated sentence, at least one word in which the subject learned to spell during the instruction phase was included. From a sample of 200 words, 10 words were chosen for inclusion in the dictated sentences by picking every 10th word from the stack.

**Instructional Approach**
Clay's (1993) descriptive lessons on using word boxes for teaching sounds heard in words, word identification, and spelling were implemented. Clay's (1993) word box lessons employed a scaffolding approach for teaching children to be aware of sounds heard in individual words. A magnetic board was used in which a divided box was drawn with a magic marker. The box was either divided into three sections, four sections, or five sections and so on depending on the number of sounds heard in each word stimulus. Selection counters were used initially and then magnetic letters and writing utensils (magic markers) were used. Visual representation of words were provided through picture cards initially until subjects grasped an understanding of the task. The following are detailed descriptions of each successive step that was provided during each word box lesson.

The first step consisted of introducing the child to the task of slowly articulating words. The experimenter presented a picture card and slowly and deliberately articulated the word aloud. The experimenter then asked the child to say the word slowly. A mirror was used initially to help the child become aware of what his lips and tongue were doing as he slowly articulated words. The second step involved the use of the divided box. A divided section which represented a square for every aural sound was presented on the magnetic board. The experimenter modeled the task for the child by articulating a stimulus word slowly and pushing
the counters in the respective divided boxes corresponding to where each sound in the word was heard. The task was then shared with the child as the experimenter articulated a word slowly while the child moved the counters into their respective squares. The child was then asked to articulate the word slowly while the experimenter moved the counters into their respective boxes. Upon providing ample opportunities for the child to practice both parts, the child was asked to complete the whole task himself. Later, the child was asked to point to the divided squares without the use of counters.

An intermediate step was employed in which the sounds were recorded in letters. A magnetic board with a divided box was drawn. The experimenter articulated a word slowly for the child, emphasizing the sounds once again. The experimenter asked the child, “what did you hear in each divided box?” The child was then given magnetic letters that corresponded to each sound he heard and was asked to push the magnetic letters into the divided boxes when a word was repeated. The child was then asked to complete the task himself. The magnetic letters were eventually replaced with writing the letters in the divided boxes as each sound in a word was heard. The experimenter modeled this for the child and then the child was asked to complete the task himself. The child was encouraged to write all of the letters he knew. If the child made incorrect correspondences, the experimenter
prompted, guided, provided corrective feedback and modeled the task again.

**Experimental Design and Evaluation**

A multiple-baseline design across subjects was used to analyze the effects of Clay's word boxes on the number of trials sufficient for students' to reach a specified criterion level on word identification and spelling skills. "In multiple baseline designs, a number of responses are identified and measured over time to provide baselines against which changes can be evaluated" (Hersen & Barlow, 1976, p. 226). When baselines were established, the experimenter applied the independent variable (Clay's word box instructional approach) to one subject and noted whether there was a change in the other subjects' baselines. The experimenter then applies the same variable to the second subject, and then to the third subject and so on, noting changes during instructional phases. The instructional approach was applied when baseline stability had been achieved. The instructional approach is functionally related to a change in performance when the change in performance appears after the instruction has been applied to one subject while the untreated subjects' performance remains relatively stable (Hersen & Barlow, 1976). Experimental control was demonstrated only when there was a change in both level and trend in word identification and spelling performance after the word box instructional approach was administered.
Therefore, the multiple baseline design across subjects was used when the experimenter systematically applied an intervention across several subjects under similar environmental conditions (Tawney & Gast, 1984).

Subjects were divided into two groups according to their grade level. The subjects were divided into two groups to prevent any one subject from remaining in baseline for an unreasonable amount of time before instruction was administered. This prevented possible ethical problems of leaving individuals in prolonged baselines when they were ready to learn new skills (Tawney & Gast, 1984). One group consisted of second-graders and the other group consisted of two third and one fourth-grader. As mentioned previously in an earlier section, all subjects regardless of grade level were lacking in very similar types of words to identify and spell. Essentially, a replication of the study was conducted given the second group of subjects.

Definition and Measurement of the Dependent Variable

The dependent variable was defined as the number of correct responses on daily word identification and spelling quizzes or probes. Words were randomly selected for each quiz. Out of a shuffled stack of 200 words that were placed on small cards, every 10th word was selected to be placed on a quiz. This word selection procedure was completed prior to each session and conducted separately for word identification and spelling quizzes. The experimenter as well as an
independent observer alternated conducting the word selection procedure. All quizzes consisted of words of similar structure such as, words containing a consonant, vowel, and a consonant and words containing a consonant blend, vowel, and a consonant. Each quiz consisted of a total of 10 words. Mastery in identifying and spelling words was considered to be obtained when the subjects received a minimum score of nine correct responses. Subjects were permitted to skip words they found to be too difficult but were strongly encouraged to attempt all words. The quizzes were administered every session during baseline, instruction, and maintenance phases of the study. The quizzes were scored and graphed on a daily basis by the experimenter.

**Interobserver Agreement**

Two independent observers scored quizzes for a total of 17 sessions for each of the six subjects during baseline, intervention, maintenance, and transfer phases. Their results were compared with scores obtained by the experimenter. The independent observers consisted of two graduate students from the College of Education at The Ohio State University. For word identification quizzes, the independent observers were asked to observe the children and score the number of words identified correctly. For spelling quizzes, the independent observers received ungraded xeroxed copies of responses made. Answer sheets were available for the independent observers. The independent observers were
instructed to mark a "c" by all the correct responses.

Percentage of interobserver agreement on individual quizzes was calculated by dividing number of agreements between the experimenter's and the observers' by the total number of agreements added to the total number of disagreements and multiplied by 100. Ninety percent agreement and above defined acceptable reliability of measurement.

The following formula was used:

\[
\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ Agreements}
\]

Procedural Integrity

Two independent observers, one doctoral candidate in the school psychology program at The Ohio State University and one masters degree student in the school psychology program at The Ohio State University, examined the instructional procedures for 10 sessions for each of the six subjects. The independent observers were instructed to indicate whether certain instructional procedures including materials and lessons were being adhered to. They were also asked to observe procedures for administering word identification and spelling probes after a 20-25 minute lesson. The procedures were specified on a form and the independent observers were
asked to respond with a "yes" or "no" to indicate if certain procedures were observed during instructional sessions (See Appendix A).

Baseline

Baseline data were collected on students' performances on word identification and spelling quizzes. For the teacher-made quizzes on word identification, a simple verbal direction was provided such as, "Say the words on this list." For the teacher-made spelling probes, verbal directions consisted of saying a word in isolation, using a word in a sentence, and repeating a word in isolation. The student was then asked to spell the word. All word identification and spelling probes consisted of 10 words. The students were asked to say and spell words as best as they could. They were permitted to skip words that they found too difficult, but were strongly encouraged to attempt all words. Feedback that indicated whether subjects made correct responses was not given before, during, and after the quizzes were taken. The correct number of responses were charted and plotted on a graph after the completion of each session. Instruction was not provided by this experimenter during baseline phases. However, students received regular reading instruction in their special education classroom as well as their regular education classroom. This had limited extraneous effects on the dependent variable as long as relatively stable baseline performance data was demonstrated.
When a stable baseline was established for one subject, intervention was administered while the other subjects remained in baseline. Once rather consistent progress in performance levels was demonstrated by the first subject, the second subject received the instruction and so on. The same systematic procedures were applied to both groups of subjects.

**Instruction**

As described in a previous section, Clay's word box instructional approach was used to help students improve upon their word identification and spelling skills. This instructional approach was different than typical phonics instruction because it incorporates explicit phonemic awareness instruction. Specifically, instead of identifying words by letter to sound approaches (typical phonics instruction), Clay's word boxes were designed to help students begin with sounds and then later map the sounds onto print. Each lesson lasted 20 to 25 minutes, leaving 5 minutes at the end of the session for administering quizzes.

All quizzes were similar in type as those described during baseline sessions. The directions for completing the probes were the same as those described in baseline sessions. Mastery level on quizzes was demonstrated by a subject obtaining a score of 9 out of 10 or 90 percent accuracy on both word identification and spelling quizzes. While the first subject in each group received the intervention, the
other two subjects in each group remained in baseline. Subject two in each group received the intervention when subject one in each group demonstrated mastery (9 out of 10 correct) on word identification and spelling probes. Clay's word boxes instructional approach was applied to subject three in each group when subject two in each group demonstrated mastery (9 out of 10 correct) on word identification and spelling probes.

**Maintenance**

Word identification and spelling quizzes or probes were systematically administered once a week over a 10 week period of time beginning four weeks after intervention ended. The teacher-made quizzes were similar in content and format to those described during baseline and intervention phases of the study.

**Transfer**

Following the establishment of maintenance levels, all subjects were asked to read short stories which contained the words that the subjects acquired during intervention sessions. Each subject was given one story per week over a three week period. Each story contained 10 of the types of words that were learned during intervention phases of the study. The subjects were also asked to write 10 sentences that were orally dictated once a week over a three week period. Each sentence contained a word that the subjects acquired during intervention. Short stories and dictated
sentences tasks were used to evaluate whether the subjects were able to transfer reading and spelling words to some other tasks independent of the context that was provided during intervention sessions.

Validity

To establish validity, a sample of Clay's word box lesson and teacher-made quizzes along with a rating form was administered to evaluators who were unaware of all conditions of the study. The evaluators consisted of five teachers of elementary grades. Two were first-grade teachers, two were special education teachers, and one was a second-grade teacher. The rating form consisted of statements such as, "The lessons are written neatly and legibly" and corresponding value statements such as "strongly agree", "agree", "not sure", and "disagree." The raters placed a designated number that corresponded to the value statements next to the statements made concerning the lessons and quizzes. See Appendix B for a sample of the validity rating scale that was used.
CHAPTER 4

RESULTS

This chapter presents the results of the study. Procedural integrity and interobserver agreement data are presented in the first two sections. Student performance data are presented individually according to each research question. The last section reports social validity results.

Procedural Integrity

Procedural integrity data were collected by two independent observers using the form in Appendix A. The form consisted of a checklist containing all essential instructional steps, materials, and procedural steps for administering quizzes. Results from the observers' responses indicated that all procedural steps were checked as being adhered to for instruction, use of materials, and the administration of quizzes.

Interobserver Agreement

Observer agreement on the scoring of word identification and spelling quizzes was calculated by using the following formula:

\[
\text{Agreements} \quad \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100
\]

Agreements + Disagreements

51
On word identification quizzes, 95 percent agreement was obtained across baseline, intervention, maintenance phases and transfer phases of the study. A total of 102 word identification quizzes were independently scored across six subjects on 17 sessions. There were five quizzes in which total agreement was not evident between the independent observers and the experimenter's scores. On spelling quizzes, 100 percent agreement was obtained across baseline, intervention, maintenance and transfer phases of the study. A total of 102 spelling quizzes were independently scored across six subjects on 17 sessions.

**Student Results**

Individual data were collected throughout the study. The subjects' quiz scores were calculated to determine the mean test scores for baseline, instruction, maintenance, and transfer phases. All percentages given have been rounded to the nearest whole percentage and are presented in Table 2. Results of each quiz for all individuals will be presented in two Figures. Figure 1 showed second-grade students' performance on word identification and spelling quizzes during baseline, instruction, maintenance, and transfer phases of the study. Figure 2 showed two third-grade students and one fourth-grade student's performance on word identification and spelling quizzes during baseline, instruction, maintenance, and transfer phases of the study. The following information provides a narrative description of each subjects' results according to each research question.
**Research Question Number One**

Will pupils reach a specified accuracy criterion in word identification as a function of Clay's (1993) word box instructional approach?

**Nate**

Nate's scores on word identification quizzes ranged from 30 to 50 percent correct with a mean score of 38 percent correct during baseline conditions. Nate's quiz scores on word identification for the sessions when Clay's word boxes instructional approach was implemented ranged from 60 to 100 percent with a mean score of 93 percent correct.

**Al**

Al's scores on word identification quizzes ranged from 10 to 60 percent correct with a mean score of 35 percent correct during baseline conditions. When Clay's word boxes instructional approach was implemented, Al's scores on word identification quizzes ranged from 70 to 100 percent with a mean of 95 percent correct.

**Harold**

During baseline conditions, Harold's word identification quiz scores ranged from 10 to 30 percent correct with a mean of 19 percent correct. Harold's word identification quiz scores ranged from 30 to 100 percent with a mean score of 81 percent correct when the word box instructional approach was implemented.
Mark

On word identification quizzes, Mark's scores ranged from 60 to 70 percent with a mean of 62 percent correct during baseline conditions. During instruction conditions, his word identification quiz scores ranged from 50 to 100 percent with a mean of 93 percent correct.

Sam

Sam's scores on word identification quizzes ranged from 40 to 60 percent with a mean of 52 percent during baseline conditions. His scores ranged from 60 to 100 percent with a mean of 95 percent correct on word identification quizzes during instruction conditions.

Mick

During baseline conditions, Mick's scores ranged from 30 to 50 percent with a mean of 38 percent on word identification quizzes. During instructional conditions when the word boxes were implemented, Mick's scores ranged from 30 to 100 percent with a mean of 74 percent correct on word identification quizzes.

Research Question Number 2

Will pupils reach a specified accuracy criterion in spelling words as a function of Clay's (1993) word box instructional approach?

Nate

During baseline conditions, Nate's spelling quiz scores ranged from 10 to 20 percent with a mean of 15 percent
correct. His quiz scores ranged from 40 to 100 percent with a mean of 89 percent correct during instructional sessions.

Al

Al's spelling quiz scores ranged from 10 to 60 percent with a mean of 30 percent correct during baseline conditions. During instructional conditions, his quiz scores ranged from 50 to 100 percent with a mean score of 87 percent correct.

Harold

Harold's spelling quiz scores during baseline conditions ranged from 0 to 30 percent with a mean of 11 percent correct. His spelling quiz scores ranged from 30 to 100 percent with a mean of 84 percent correct during instructional conditions.

Mark

During baseline conditions, Mark's spelling quiz scores ranged from 30 to 40 percent correct with a mean score of 32 percent correct. His spelling quiz scores during instructional conditions ranged from 30 to 100 percent with a mean of 87 percent.

Sam

On spelling quizzes, Sam's quiz scores ranged from 10 to 50 percent with a mean of 35 percent correct during baseline conditions. During instructional conditions, Sam's spelling quiz scores ranged from 60 to 100 percent with a mean of 87 percent correct.
Mick
During baseline conditions, Mick's spelling quiz scores ranged from 10 to 30 percent with a mean score of 20 percent correct. On spelling quiz scores during instructional conditions, Mick's scores ranged from 20 to 100 percent with a mean of 72 percent correct.

Research Number Question Number 3
Will word identification skills acquired when using Clay's (1993) word boxes instructional approach be maintained one month after intervention ended?

Nate
Over 10 maintenance sessions, Nate's word identification quiz scores ranged from 90 to 100 percent with a mean score of 98 percent correct.

Al
Al's word identification quiz scores ranged from 50 to 90 percent correct with a mean score of 83 percent correct over 10 maintenance sessions.

Harold
On word identification quizzes, Harold's scores ranged from 60 to 80 percent with a mean score of 73 percent correct over 10 maintenance sessions.

Mark
Mark's word identification quiz scores over 10 maintenance sessions ranged from 90 to 100 percent correct with a mean score of 99 percent correct.
Sam

Word identification quiz scores ranged from 80 to 100 percent correct with a mean score of 91 percent correct for Sam over 10 maintenance sessions.

Mick

Mick's word identification quiz scores ranged from 90 to 100 percent correct with a mean score of 95 percent correct over 10 maintenance conditions.

Research Question Number 4

Will spelling skills acquired when using Clay's (1993) word boxes instructional approach be maintained after intervention has been terminated?

Nate

Over 10 maintenance sessions, Nate's spelling quiz scores ranged from 90 to 100 percent with a mean score of 91 percent correct.

Al

Al's spelling quiz scores ranged from 80 to 90 percent accuracy with a mean score of 85 percent correct over 10 maintenance sessions.

Harold

On spelling quizzes, Harold's scores ranged from 70 to 80 percent correct with a mean score of 76 percent accuracy over 10 maintenance sessions.
Mark

Mark's spelling quiz scores ranged from 80 to 90 percent accuracy with a mean score of 88 percent correct over 10 maintenance sessions.

Sam

Over 10 maintenance sessions, Sam's spelling quiz scores ranged from 50 to 100 percent accuracy with a mean score of 88 percent correct.

Mick

On spelling quizzes over 10 maintenance sessions, Mick's scores ranged from 80 to 100 percent correct with a mean score of 92 percent correct.

Research Question Number 5

Will word identification skills acquired be transferred to another context after intervention ended?

Nate

Nate's scores on word identification transfer tasks ranged from 90 to 100 percent with a mean score of 96 percent over three transfer sessions.

Al

Over three transfer sessions, Al's scores on word identification transfer tasks ranged from 80 to 90 with a mean of 86 percent accuracy level.
Harold

Over three transfer sessions, Harold's word identification quiz scores ranged from 70 to 80 percent accuracy with a mean score of 73 percent correct.

Mark

Mark's scores on word identification transfer tasks were all at a 100 percent accuracy level over three transfer sessions.

Sam

Sam's scores on word identification transfer tasks over three transfer sessions were all at a 100 percent accuracy level.

Mick

On word identification transfer tasks, Mick's scores ranged from 70 to 80 percent correct with a mean score of 73 percent correct over three transfer sessions.

Research Question Number 6

Will spelling skills acquired be transferred to another context after intervention ended?

Nate

Over three transfer sessions, Nate's scores on spelling transfer tasks were all at an 80 percent accuracy level.

Al

Al's scores on spelling transfer tasks over three transfer sessions were all at a 90 percent accuracy level.
Harold

Harold's scores on spelling transfer tasks were all at an 80 percent accuracy level over three transfer sessions.

Mark

Mark's scores on spelling transfer tasks were all at an 80 percent accuracy level over three transfer sessions.

Sam

Over three transfer sessions, Sam's scores on spelling transfer tasks ranged from 70 to 100 percent with a mean of 83 percent correct.

Mick

Mick's scores over three transfer sessions ranged from 80 to 90 percent correct with a mean score of 86 percent accuracy on spelling transfer tasks.

Number of Trials to Reach A Specified Accuracy Criterion

An examination of the number of trials on word identification and spelling quizzes it took each student to reach a specified criterion level was conducted. Table 3 presents the number of trials it took each subject to reach a specified accuracy criterion of a minimum score of nine correct responses on word identification and spelling quizzes during the instruction condition. For the six students studied, the number of trials ranged from three to seven with a mean of five trials to reach the specified accuracy criterion on word identification quizzes. On spelling quizzes, trials ranged from four to nine with a mean of
approximately six trials to reach the specified accuracy criterion for the six students studied.

**Research Question Number 7**

Are teacher-made quizzes and Clay's word boxes instructional approach a valid way to assess and teach word identification and spelling to pupils who learn at a slow rate?

Five teachers were asked to rate the teacher-made quizzes and Clay's (1993) word box instructional approach on the basis of eight criteria:

1. The lessons and quiz sheets were written legibly and neatly.
2. The lessons are directly related to what is being tested on the quizzes.
3. The lessons consist of reading skill instruction that will help students progress in school.
4. The lessons consist of spelling skill instruction that will help children progress in school.
5. Clay's (1993) word identification approach seems to be more helpful to teach phonemic awareness and word identification in school.
6. Clay's (1993) word box instructional approach seems to be more helpful to teach spelling skills in school.
7. I would use Clay's (1993) word boxes instructional approach in a classroom to teach phonemic awareness and word identification skills.
8. I would use Clay's (1993) word boxes instructional approach in a classroom to teach spelling skills.

Generally, the five professionals agreed on all eight criteria. On criteria number 7 and 8, two professionals who were teachers of regular elementary grades were unsure due to the relatively large number of children they work with.

**Summary of Results**

A reliability score of 95 percent was obtained for the scoring of the word identification quizzes during baseline, instruction, and maintenance and transfer phases of the study. On spelling quizzes, reliability scores were 100 percent during baseline, instruction, and maintenance phases of the study as well as for spelling transfer tasks during transfer conditions of the study. Procedural integrity checks indicated that all procedures as specified were adhered to with every subject across several instructional lessons.

Results of the study indicated that all subjects reached at least 90 percent accuracy criterion on the quizzes during the instructional sessions. All but one subject demonstrated at least 90 percent accuracy criterion on word identification quizzes during maintenance sessions of the study. One subject achieved up to 80 percent accuracy on word identification quizzes during maintenance sessions. On spelling quizzes, all but one subject achieved at least 90 percent accuracy criterion during maintenance sessions. One subject achieved up to 80 percent accuracy on spelling quizzes during maintenance sessions. Nate, Mark, and Sam
achieved an average of 90 percent accuracy on word identification transfer tasks. Harrold and Mick achieved an average of 70 percent accuracy on word identification transfer tasks. All but one subject achieved an average of a minimum score at 80 percent accuracy on spelling transfer tasks. Al achieved an average of 90 percent accuracy on spelling transfer tasks. On average, professionals agreed with the criteria which indicated that they believe the lessons and quizzes to be valid.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Condition</th>
<th>Word Identification</th>
<th>Spelling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>Mean</td>
</tr>
<tr>
<td>Nate</td>
<td>Baseline</td>
<td>30-50%</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>60-100%</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>90-100%</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>90-100%</td>
<td>96%</td>
</tr>
<tr>
<td>Al</td>
<td>Baseline</td>
<td>10-60%</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>70-100%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>50-90%</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>80-90%</td>
<td>86%</td>
</tr>
<tr>
<td>Harrold</td>
<td>Baseline</td>
<td>10-30%</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>30-100%</td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>60-80%</td>
<td>73%</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>70-80%</td>
<td>73%</td>
</tr>
<tr>
<td>Mark</td>
<td>Baseline</td>
<td>60-70%</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>50-100%</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>90-100%</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>All 100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2
Ranges and Average Percentages on Students’ Word Identification and Spelling Daily Quiz Scores During Four Conditions
<table>
<thead>
<tr>
<th>Subject</th>
<th>Condition</th>
<th>Word Identification</th>
<th>Spelling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean</td>
<td>Range</td>
</tr>
<tr>
<td>Sam</td>
<td>Baseline</td>
<td>40-60%</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>60-100%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>80-100%</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>All 100%</td>
<td>100%</td>
</tr>
<tr>
<td>Mick</td>
<td>Baseline</td>
<td>30-50%</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>30-100%</td>
<td>74%</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>90-100%</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>70-80%</td>
<td>73%</td>
</tr>
</tbody>
</table>

Table 2 (continued)

Ranges and Average Percentages on Students' Word Identification and Spelling Daily Quiz Scores During Four Conditions
Figure 1  Word identification and spelling performance across 3 second grade subjects
Figure 2 Word identification and spelling performance across 3 third and fourth grade subjects.
### Table 3

<table>
<thead>
<tr>
<th>Subject</th>
<th>Word Identification</th>
<th>Spelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nate</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Al</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Harrold</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Mark</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Sam</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Mick</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

**Number of Trials It Took Each Subject to Reach Mastery Level On Word Identification and Spelling Quizzes During the Instructional Condition**
Chapter 5

Discussion

This chapter includes a discussion of the results as they relate to six of the research questions. Following this section, the limitations are addressed, and implications for future research and educational practices are offered.

The purpose of this study was to determine the effectiveness of Clay's (1993) word box instructional approach on teaching word identification and spelling skills compared to conditions when no such instruction was given. The effectiveness of the instructional approach was determined by the criterion level students reached and maintained over a period of time compared to baseline conditions when no such instruction was given. The experimenter analyzed the results from the students' word identification and spelling quiz scores during baseline, instruction, and maintenance conditions of the study. Measurable word identification and spelling transfer tasks were examined from each students' performance during transfer conditions.
Effectiveness of Clay's (1993) Word Box Instructional Approach

The results are discussed according to each research question.

**Research Question Number One**

Will pupils reach a specified accuracy criterion in word identification as a function of Clay's (1993) word box instructional approach?

Generally, students reached mastery levels of performance in relatively few trials when the word box instructional approach was used in contrast to the baseline conditions when no such approach was used. Students did not reach mastery level during baseline conditions. Data suggested the word box instructional approach was a useful tool for helping children who were identified as learning disabled identify words.

**Research Question Number Two**

Will students reach a specified accuracy criterion in spelling words as a function of Clay's (1993) word box instructional approach?

In general, the students reached mastery levels of performance on spelling quizzes when the word box instructional approach was implemented in contrast to baseline conditions when no such approach was used. This was
accomplished in relatively few trials. None of the students reached mastery level during baseline sessions. Data suggested the word box instructional approach was useful for helping children who were learning disabled spell words. On average, scores on spelling quizzes were somewhat lower than scores on word identification quizzes.

**Research Question Number 3**

Will word identification skills acquired when using Clay's (1993) word boxes instructional approach be maintained one month after intervention ended?

Maintenance data were obtained once a week over a 10 week period one month after intervention had been terminated. All subjects but one were able to rather consistently maintain mastery levels of performance on word identification quizzes one month after instruction had ended. One subject, Harold, was able to rather consistently identify 7 and 8 out of the 10 words that were given once a week over a 10 week period. Even though this particular subject did not maintain word identification skills taught at the specified mastery criterion level, he obtained scores that were higher than those obtained during baseline conditions. In other words, this subject did not regress to the level of accuracy demonstrated during baseline conditions.

**Research Question Number 4**

Will spelling skills acquired when using Clay's (1993) word boxes instructional approach be maintained one month after intervention ended?
On spelling performance, all subjects but one rather consistently demonstrated mastery at the specified accuracy criterion during maintenance sessions. Two subjects obtained a score of 5 out of 10 during one out of 10 maintenance sessions. However, the majority of scores were a minimum of 9 out of 10 during 10 maintenance sessions. One subject, Harold, did not maintain spelling skills learned at the specified accuracy criterion level. This particular subject rather consistently obtained scores of 7 and 8 out of 10 over 10 maintenance sessions. Once again, this subject's scores did not regress to the accuracy level demonstrated during baseline sessions.

Research Question Number 5

Will word identification skills acquired be transferred to another context one month after sessions using Clay's (1993) word box instructional approach had ended?

Teacher-made short stories that contained 10 of the types of words that were learned during instructional sessions were administered to all subjects over three sessions, one per week one month after instructional sessions had ended. All subjects except for two were able to transfer skills at a minimum of 90 percent accuracy level on word identification transfer tasks. Two subjects obtained scores of 10 out of 10 over all three transfer sessions. On the average, two subjects obtained minimum scores at a 70 percent accuracy level on word identification transfer tasks over the three transfer sessions. This indicated that all students...
were able to generalize from skills learned in one context and apply them to another context.

**Research Question Number 6**

Will spelling skills acquired be transferred to another context one month after sessions using Clay's (1993) word box instructional approach had ended?

Spelling transfer tasks consisted of 10 sentences that were dictated orally to the subjects. Each sentence contained one of the types of words that were taught during instructional conditions. The subjects were required to write entire sentences. On average, all subjects performed at an 80 percent accuracy level on spelling transfer tasks. Their performance indicated that they were able to transfer skills learned during one condition to another.

**Limitations of the Study**

Limitations of the study are listed and discussed in this section.

1. Since Clay's (1993) word boxes instructional approach was not compared to other phonemic awareness, word identification, and spelling instructional approaches, it is not evident whether this approach is any more effective than other instructional approaches that incorporates the explicit teaching of phonemic awareness, word identification and spelling skills.

2. Since Clay's (1993) word boxes instructional approach was only used in this particular study to teach identification and spelling of the types of words in which each sound heard
in spoken language was represented by an alphabetic code (a letter), the results found cannot be generalized to other types of words.

3. Due to the types of teacher-made word identification and spelling transfer tasks that were used in this study, it is not evident whether the subjects were able to transfer skills learned to authentic reading and writing materials that are typically used in classroom settings.

4. Since the researcher used a small sample of children who were identified as learning disabled and who were selected based on their similar types of limited word identification and spelling skills, the results of this study cannot be generalized to similar groups of subjects unless the study is replicated.

**Implications for Future Research**

Suggestions for future research are included in this section based on the findings and limitations of the present study.

1. It would be valuable to examine children's word identification and spelling skills when Clay's (1993) word box instructional approach is compared to other instructional approaches that incorporate the teaching of phonemic awareness, word identification, and spelling skills.

2. Studies using the word box instructional for teaching other types of words than what was used in the present study would be informative.
3. It would be valuable to examine whether students could transfer skills learned to contexts other than the transfer contexts that were used in this study.

4. Further research is needed on larger samples of students identified as learning disabled in basic reading skills to verify the effectiveness of the word boxes instructional approach.

Conclusions

The current study is not without its limitations and future research may possibly prove to strengthen the positive results found from using Clay's (1993) word box instructional approach. The results suggested an interdependent relationship between word identification and spelling skills especially when children were explicitly taught phonemic segmentation through the word box instructional approach. One can view this interdependent relationship as one examines the rather simultaneous trend and level of progress evident in all subjects' word identification and spelling skills when the word box instructional approach was implemented. This notion of how spelling and word identification develop interdependently is consistent with Gaswomi and Bryant's (1990) discussion on this topic.

Although teacher-made transfer tasks were used in this study, it remains important to note that the children were generally able to read words in context with much ease and were able to write words correctly within the context of an entire sentence with success after being explicitly taught.
phonemic awareness, word identification, and spelling skills. This is consistent with the discussion on how explicit teaching of word decoding strategies "frees up" some of the cognitive demands involved in reading words in connected text (Stanovich, 1996; Stahl, 1992). It should be noted, however, that reading words presented in connected text may be a result of the child using various strategies other than phonological recoding ones (Perfetti, 1985).

An important aspect of this study is that the design and systematic way of collecting data on students' ongoing performance corresponded to Clay's (1991) overall programmatic philosophy of how emergent literacy skills should be addressed. Clay emphasized mastery and accuracy of student performance on emergent reading skills. A way for teachers to monitor whether students are reaching mastery is to systematically observe students over time using standard tasks and standard administration procedures so that the process and outcomes are given full attention. Several observations were made on students' performances in this study which according to Clay (1993) provides a more complete picture of students' performance levels and decreases the likelihood of observer bias.

There has been discussion of "Matthew Effects" in reading for the disabled in which the poor get poorer in reading and the rich get richer in reading (Stanovich, 1996). Although much research is needed to expand upon and make generalizations on the findings from this study, the students
in this investigation showed positive gains in word identification and spelling performance which at least made their skills richer in ways that they were not before.
LIST OF REFERENCES


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Procedural Integrity Checklist

Subject Name__________________________
Date_______________________________
Observer__________________________

Instructional Materials Used:

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Description</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Magnetic board was used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Erasable markers were used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Divided box was drawn on magnetic board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Counters were used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Magnetic letters were used</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Instruction Condition:

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Experimenter slowly articulated words while child pointed or pushed counters into respective divided sound box.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Child slowly articulated words while pointing or pushing counters into respective divided sound box.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Experimenter slowly articulates words while child pushes respective magnetic letters into divided box.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Child slowly articulates words while pushing respective magnetic letters into divided box.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Experimenter slowly articulates words while child writes letters in divided box.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Child slowly articulates words while writing letters in divided box.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quiz Condition</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>-----</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>1. On word identification quiz, examiner says &quot;read the following words.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. On spelling quiz, examiner says &quot;spell the following words.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The examiner provided feedback during the administration of quizzes.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

VALIDITY RATING FORM
Validity Rating Form
Rating the Instructional Plans Corresponding to Clay's (1993) Word Boxes Instructional Approach and Teacher-Made Quizzes

Instructions: Please rate each item according to the following scale:
1-Strongly Agree 2-Agree 3-Not Sure 4-Disagree

1. The lessons and quiz sheets are written legibly and neatly. _____
2. The lessons are directly related to what is being tested on the quizzes. _____
3. The lessons consist of reading skill instruction that will help students progress in school. _____
4. The lessons consist of spelling skill instruction that will help students progress in school. _____
5. Clay's (1993) word boxes instructional approach seem to be more helpful for teaching phonological awareness and word identification in school. _____
6. Clay's (1993) word boxes instructional approach seem to be more helpful for teaching spelling skills in school. _____
7. I would use Clay's word boxes instructional approach in a classroom to teach phonological awareness and word identification. _____
8. I would use Clay's word boxes instructional approach in a classroom to teach spelling skills. _____
APPENDIX C

WORD LISTS
WORD LIST

AND  GLAD  PLAN  SCAT  SPIT  DASH  BEST  WIN
FLIP  NIP  STRAP  TRIM  FLAP  BLAND  VAN  WON
FUN  NOT  STRIP  TAB  DROP  BLOT  BUS  TUB
BIG  GUT  PEST  SWIM  TROT  BRIM  MUST  PLAY
BED  GET  PIN  STOP  FIT  GRIP  MAY  BEG
FAN  PAT  SLIM  DRIP  MUG  SMASH  SAY  CUP
FIN  PLAT  SPAT  MIT  SLAP  SNAP  BAY  ANT
FLOP  PLOT  SPLAT  SUN  FOT  FLIP  STAY  COB
BAT  GAP  PLUG  SLUG  SKIM  FLAG  DAY  LOT
BAN  HAT  POP  SLIP  TRAP  FLOP  GRAY  SUB
BUN  HUT  ROT  SPIN  FLAP  SLAB  SWAY  STUB
BRAT  HUG  RUG  SLOB  MAN  SNAG  SAND  TRUST
BRAG  GRAB  GRIN  SPED  SLAP  NET  LAND  SCRAM
BLOB  GRIT  RUST  SCAT  TRIP  FLAT  TOP  SLID
BAND  HIP  RAN  SLOT  SCAB  SCAN  STAB  GUM
CAT  HIT  RIP  SPOT  ROB  HIM  SOB  LIST
CAN  HOT  RAP  TUG  RIB  DUG  TAB  DID
CLAP  JUG  RAT  TAG  CRIB  DIM  HAM  HIS
CUT  JOB  RUT  TAN  WIT  SLAM  CLAM  BUS
CLIP  LIP  RUN  TIP  ZIP  TEST  CRAP  MAY
CAP  LOG  RED  TOP  SIP  PIN  DOG  PAST
CRAB  CROP  SNAP  KIT  STAND  COP  DRUM  BLAST
CLIP  LIP  RUN  TIP  ZIP  TEST  CRAP  MAY
CAP   LOG  RED  TOP  SIP  PIN  DOG  PAST
CRAB  CROP  SNAP  KIT  STAND  COP  DRUM  BLAST
CLAN  CRAM  LAB  PIT  SPIT  HOP  TWIN  SAD
COT   DIP  LET  SIT  SKIP  FAT  WAY  TASK
DIG   MAP  SAT  TROT  SKIM  ZEST  WED  MASK