The effects of structured one-on-one tutoring in sight word recognition of first-grade students at-risk for reading failure

Laureen Goers Mayfield

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THE EFFECTS OF STRUCTURED ONE-ON-ONE TUTORING IN SIGHT
WORD RECOGNITION OF FIRST GRADE STUDENTS
AT-RISK FOR READING FAILURE

by

Laureen Goers Mayfield, B.A., M.Ed.

A Dissertation Prospectus Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

COLLEGE OF EDUCATION
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May 2000
We hereby recommend that the dissertation prepared under our supervision by Laureen Goers Mayfield entitled The Effects of Structured One-on-One Tutoring in Sight Word Recognition of First Grade students At-Risk for Reading Failure be accepted in partial fulfillment of the requirements for the Degree of Doctor of Education.

Supervisor of Dissertation Research

Head of Department

Curriculum, Instruction and Leadership Department

Advisory Committee

Approved:

Director of Graduate Studies

Dean of College

Approved:

Dean of Graduate School and University Research
ABSTRACT

The purpose of this study was to determine the effects of an alternative reading program on the performance of at-risk first graders. Sixty first graders from three north Louisiana public elementary schools with high poverty rates, who were determined by their teachers and principals to be functioning in the bottom 20 to 30% of first grade reading students, were purposefully selected. Students were pretested on three subtests of the Woodcock Reading Mastery Test-Revised (WRMT-R), Form G: Letter Identification, Word Identification, and Word Attack. Participants were randomly assigned to either a control or an experimental group. Experimental group students received 15 minutes per day of tutoring by America Reads Volunteers in the Edmark Reading Program, a highly structured sight word program. In order to partially control for the Hawthorne Effect, control group students were read aloud to for 15 minutes each day by the same volunteers.

At the completion of the first semester of the school year, the 60 participants were tested on four subtests of the WRMT-R, Form H (Letter Identification, Word Identification, Word Attack, Passage Comprehension) and were asked to read aloud the 150 words taught in the treatment program. Qualitative data were also collected in the form of student, parent, teacher, and administrator interviews, observation, and examination of documents. Quantitative data were analyzed with four ANCOVAs and one ANOVA using the General Linear Model; stepwise multiple regression was used to
determine covariates for each subtest. Qualitative data were examined using content analysis.

Results indicated a significant difference in the performance of experimental group students on the WRMT-R Passage Comprehension subtest and Edmark posttest; there were no significant differences between experimental and control group means on the WRMT-R Letter Identification, Word Identification, and Word Attack subtests. Qualitative data indicated that more experimental group students than control group students exhibited significantly improved reading ability, attitudes toward reading, attitudes toward school, and attitudes toward self. Results suggested that schools should consider the use of volunteers to implement one-on-one tutoring in the Edmark Reading Program to teach a supplementary sight word vocabulary to at-risk first graders.
DEDICATION

This dissertation is dedicated to my daughter, Meghan, whose unfailing love and support made its completion possible. I thank her for sacrificing time with me during the past four years, for accepting my not being able to do all the things “everyone else’s moms” had time to do, for sitting through many classes and innumerable office hours with me, for punching thousands of holes in numerous drafts of the dissertation, and for helping me do research in the Tech library, proclaiming with resignation, as she fed endless dimes into the copying machine, “There goes another Beanie Baby. . .”
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For I know well the plans I have in mind for you, says the Lord, plans for your welfare, not for woe! Plans to give you a future full of hope. (Jeremiah 29: 11)
The problem of functional illiteracy in the United States is enormous in scope. One-fourth of all 17-year-olds still in school read below the level needed to read simple popular magazines; 14% have already dropped out of school by age 17 (Slavin, Karweit, & Madden, 1989). The primary reasons students report for dropping out are school-related, such as poor performance or reading difficulties; personal reasons (such as pregnancy) are second, with economic reasons cited third (Garcia, 1991). Reading failure is not just an issue of poverty, as more than 10% of advantaged students are unable to read popular magazines, and only half of that population have the skills necessary to read most newspaper stories or popular novels (Slavin et al.). According to the *NAEP 1998 Reading Report Card for the Nation* (Donahue, Voelkl, Campbell, & Mazzeo, 1999), no significant changes have been observed in grade 4 student reading achievement levels since the 1992 or 1994 national surveys, indicating that reading achievement of elementary school children is not improving.

The reading disability problem is chronic and pervasive; under even ideal circumstances, reading disabled children do not usually catch up with their non-disabled peers, and many actually become worse over time (Aaron, 1997; Cunningham & Stanovich, 1998; Stanovich, 1986; Torgesen, 1998). Longitudinal studies show that
74% of students identified in third grade as reading disabled remain this way through ninth grade, even after receiving special education services (Lyon, 1996). In order to receive such special education services designed to remediate their reading deficits, students must undergo diagnostic assessments and be diagnosed with a disabling condition. Diagnosis of a specific learning disability in reading, for example, results in the labeling of the student. Researchers are calling for an end to special education labeling of children, and instead, the provision of specialized reading instruction for all who need it (Aaron; Algozzine & Ysseldyke, 1983; Allington & McGill-Franzen, 1990; McCormick & Becker, 1996). The goal of early intervention with all children displaying poor reading skills is to prevent their failure in school, as well as their referral to special education.

The traditional methods for dealing with non- or poor readers have included grade retention, ability grouping, special education placement, and Title I pull-out programs; many researchers believe these approaches have been equally ineffective. Grade retention amounts to a second dose of the “medicine” that failed to work the first time, and the result is often the social promotion of non-readers after two years in each grade. Ability grouping, or tracking, often creates a climate conducive to failure experiences, and may develop into “curriculum ghettos” where academic choices depend upon race, gender, and socioeconomic class expectations (Robinson, 1992). While special education has shouldered much of the burden of educating students at-risk of reading failure, special education pull-out and self-contained programs rarely accelerate students enough to catch up with their same age peers (Haynes & Jenkins,
Title I programs are also largely ineffective, and sometimes result in resegregation (Allington & McGill-Franzen, 1990; Becker, 1977; Slavin et al.). While programs such as Reading Recovery (Clay, 1979) and Success for All (Slavin, Madden, Dolan, & Wasik, 1996) have been successful with many students at-risk for reading failure, their cost is often prohibitive to school districts (Gettys, 1994; Shanahan & Barr, 1995). According to Shanahan and Barr, implementation of Reading Recovery necessitates an approximate annual per pupil expenditure of between $4,000 and $4,625, which includes training and salary of a Reading Recovery teacher and cost of instructional materials depreciated over four years' time. Because the average per-pupil cost in the United States in 1993 was $5,938, according to Shanahan and Barr, the cost of having a child in Reading Recovery increases per-pupil educational costs for that child by approximately 80% during the year of enrollment. Because Success For All is a school-wide program, its cost is based primarily on the size of the participating school. Hill (1998) reported that one with 500 students would typically pay $62,000 for the first year of Success For All implementation, $26,000 the second, and $20,000 the third. Because of decreasing training costs, subsequent years drop to approximately $5,000 per year. Fees include initial training of the school’s principal and facilitator, at least 23 days of on-site training and assistance from a Success For All staff member, telephone assistance, and curriculum materials.

Vadasy, Jenkins, Antil, Wayne, and O’Connor (1997b) have pointed out that individual tutoring is beyond the financial means of most schools, yet it is most often the intervention of choice for students in need of special assistance. Vadasy et al.
further explain that such tutoring intervention becomes more attractive to schools if it can be delivered by low-cost, yet effective tutors. In addition to their high cost, neither Reading Recovery nor Success For All, which the literature reports as being among the most comprehensive and most successful in terms of reduced grade retentions and special education placements, remediate deficits for all children (Gaffney, 1993; Pinnel, Lyons, DeFord, Bryk, & Seltzer, 1994; Shanahan & Barr, 1995; Wasik & Slavin, 1993). Reading Recovery, for example, does not work for 10 to 30% of children enrolled in the program and children with identified learning disabilities are not included in the program (Shanahan & Barr).

**Purpose of the Study**

The purpose of the study was to investigate the effects of using an economically feasible sight word training program as a supplementary intervention with first grade students at-risk for reading failure. The nonconsumable *Edmark Reading Program* Level I kit can be purchased for $475; the only additional expense is the purchase of Student Record Booklets, in which the tutor records the date of lessons taught, the child’s missed words, and scores on post-tests given after the introduction of every 10 words, for $10.95 for a set of 5 booklets. The fact that program administration does not require a certified teacher would greatly reduce the cost in salaries to implement a tutoring program using *Edmark*. In the current study, the tutoring was implemented by America Reads volunteers, at no cost to the school system. In rural parishes such as the one involved in this study, supplementary, alternative interventions cannot be implemented if money is not available to fund them. The participating parish in the
study, for example, receives minimal funding from the state Minimum Foundation Program, and recently sought a tax referendum in order to fund teacher pay raises and newly mandated remedial summer programs.

Using a highly structured approach and an errorless discrimination method, the *Edmark Reading Program* (1992), Level 1, is designed to develop a 150 sight-word vocabulary in beginning or disabled readers (see Appendix A for a more complete description of the *Edmark* program. The researcher has used the *Edmark Reading Program* with learning disabled, mentally retarded (mild/moderate), and autistic children in both public school and institutional settings for 13 years. While the institutionalized mentally retarded and autistic children ranged in age from 6 to 21 years, the learning disabled public school students were primarily in first through third grades. The *Edmark Reading Program* has traditionally been used with special education students (Conners, 1992; Vandever & Stubbs, 1977; Walsh & Lamberts, 1979); however, the literature contains no report of its use with non-special education students. Based upon past experience with students in first through third grades, as well as information discovered in a review of applicable literature, it was hypothesized that the *Edmark Reading Program* could benefit at-risk first grade readers. While the majority of the literature agrees that phonemic awareness and mastery of phonetic decoding skills are ultimately required for successful reading, it was hypothesized that such skills take years to develop in some at-risk readers. Torgesen (1998) maintains that beginning reading instruction for children with phonological weaknesses must be
more intensive or last significantly longer than normal instruction, or the children will lag significantly behind their peers.

The majority of the researcher’s former special education students in first through third grade who possessed poor phonemic awareness and phonetic decoding skills were able to develop functional sight word vocabularies using the *Edmark Reading Program*. These sight word vocabularies allowed students to become readers and maintain passing reading grades while their phonemic awareness and phonetic decoding skills developed over the course of several years. It was thus hypothesized that children identified as being at-risk for reading failure could benefit from the *Edmark Reading Program*‘s approach by acquiring a sight word vocabulary sufficient to prevent reading failure and special education referral, and to permit interaction with text while phonetic skills developed over the long term. The current literature contains no research on the use of the *Edmark Reading Program* with any population other than mentally retarded students from 11 to 15 years of age. The one-on-one tutoring given in this study by volunteers could be replicated in elementary schools in an economically feasible manner using volunteers, teacher aides, or peer tutors. The researcher has previously trained both teacher aides and parents in the use of the *Edmark Reading Program* in approximately two hours, and has overseen its use by special education students in peer tutoring situations in Resource Room settings. The *Edmark Reading Program* manual specifies that no special skills or training are required of the teacher, other than the ability to speak (or sign) and read the English language, and the devotion of one or two hours to become familiar with program components. The *Edmark*
*Reading Program* describes the most important assets for those teaching the program as a positive, encouraging attitude toward the student and the patience to work slowly and consistently. The manual encourages program use by parents, grandparents, other students, teacher's aides, and volunteers, as well as certified teachers.

**Justification of the Study**

Word recognition is one of the precursors to reading comprehension, and therefore, if a child has difficulties in both word recognition and comprehension, improvement of the former skill should be first priority (Aaron, 1997; Spear-Swerling & Sternberg, 1994). Levy, Abello, and Lysynchuk (1997) describe some agreement in the literature that children should not be asked to read texts containing high proportions of unfamiliar words, because doing so renders them unable to focus attention on meaning processing. On the other hand, improving word recognition and reading fluency leads to increased comprehension. Dolch (1950) emphasized the importance of teaching a sight vocabulary by compiling *The Dolch Basic Sight Word List* in the mid-1930's from studies done in the 1920's.

Biemiller and Siegel (1997) designed a program to provide students first with a sight vocabulary of 150 words from the Dolch list. The researchers concluded that the superior word-identification skills in grade two, a year after the intervention, suggested that acquiring a larger sight word vocabulary in first grade helped the children profit more from the whole language instruction they received in second grade. The authors believe that phonemic training is better introduced when the students have some sense of what reading is and what the value of decoding would be.
Rankhorn, England, Collins, Lockavitch, & Algozzine (1998) also stressed that providing initial success experiences for beginning readers is crucial. The intervention in this study taught a basic sight vocabulary in order to allow students successful reading experiences while the long-term process of phonemic training continued in their reading and spelling instruction in the regular first grade classroom. The intervention differed from programs described in existing research in that it taught sight words using a highly structured, errorless discrimination method. In this approach, the word to be learned appears alone and the student is told to “Point to the word ____.” In the next four to six presentations of the word, it appears with non-word letter groups which are grossly dissimilar from the target word. Next, the student is presented with three real words and told to point to the target word. On the last presentation, the student is asked to read the target word. Walsh and Lamberts (1979) found this errorless discrimination method to be significantly more effective than a picture-fading method with Trainable Mentally Retarded (TMR) students. A review of literature done by Conners (1992) on sight word instruction for the moderately mentally retarded found that picture integration, constant delay, and the Edmark Reading Program method were the most effective of all interventions described in the literature for use with the retarded.

While the greatest consensus in the literature appears to be the acknowledgment of phonological deficits in reading disabled students, phonological training programs have not frequently resulted in practically significant, substantial gains in reading skills (Oakland, Black, Standord, Nussbaum, & Balise, 1998; Uhry & Shepherd, 1997).
Vadasy, Jenkins, Antil, Wayne, & O’Connor (1997b) explored one-on-one phonetic tutoring by nonteachers as an economical intervention, but resulting small gains pointed to the possible problem of using nonprofessionals to teach complicated phonological skills. Each lesson used in this intervention included activities on letter sounds and beginning sound instruction, rhyming, auditory blending, segmenting, spelling and analogy use, story reading, and writing. The researchers had hoped to compensate for their tutors’ lack of expert knowledge by very carefully attending to the content and structure of the lessons, but they clearly concluded that the knowledge base needed to teach their reading program required content and pedagogical knowledge beyond the ability of their tutors, especially in the area of sound blending. The authors called for further research on ways to structure content of reading instruction so that it can be delivered economically to the many students who enter first grade with poorly developed phonological skills.

The structured program utilized in this study can be used with nonprofessionals after a minimum of training. The Edmark Reading Program (1992) manual states that the only prerequisites for successful implementation are the ability to read and follow simple directions, and a willingness to praise children for success experiences. The current intervention was therefore designed to eliminate or reduce the problem cited in past research of requiring tutors to teach phonetic decoding skills which are beyond their ability and knowledge base as non-certified staff.

Methods currently in use to remediate deficits in word recognition skills of disabled readers include (a) initial word learning strategies such as sight word training.
(Biemiller & Siegel, 1997), (b) sight word training using a rebus-type program (Rankhorn et al., 1998), and (c) word identification speed training (Levy et al., 1997). Phonological approaches such as that utilized by Uhry and Shepherd (1997) use direct phonological decoding training to address phonological deficits, which are widely acknowledged in the literature. While significant improvements were noted, Uhry and Shepherd's efforts failed to raise half of the participants to average functioning. The combination of phonetic instruction with multisensory methods (Oakland et al., 1998) also resulted in below average levels in word recognition for students, as did an attempt to have phonetic instruction delivered by nonprofessional tutors.

While the efficacy of using metacognitive strategies was shown by Das, Mishra, and Pool (1995) and Lovett and Steinbach (1997), the combination of phonological and metacognitive strategies was not explored by the researchers. While most reviewed studies reported statistically significant improvements in one or more reading skills, many admitted the actual gains were minor, especially in terms of the intensity, duration, and cost of treatment. While Reading Recovery and Success for All do combine phonological and metacognitive strategies, and have achieved the greatest success documented in the literature with at-risk readers (Gaffney, 1993; Pinnel, Lyons, DeFord, Bryk, & Seltzer, 1994; Ross, Smith, Casey, & Slavin, 1995; Slavin et al., 1996) both programs are costly (McCarthy, Newby, & Recht, 1995). The parish in which the current research was conducted did not have the financial resources to implement either Reading Recovery or Success for All as means of preventing reading failure in first grade students.
A significant point of agreement in the literature is the acknowledgment of the Matthew Effect and the resulting call for early intervention (Aaron, 1997; Spear-Swerling & Sternberg, 1994; Uhry & Shepherd, 1997). The Matthew Effect refers to the rich-get-richer, poor-get-poorer phenomenon in which good readers become more and more motivated to read, get more practice reading, are expected to achieve more, and acquire additional cognitive skills through the process of frequent reading (Spear-Swerling & Sternberg). Poor readers, on the other hand, experience lower motivation and expectations and have less practice reading, which leads to slow growth in acquiring new vocabulary and verbal information. What starts as a specific problem with reading escalates into a disability that affects cognition in general as well as other academic areas. Uhry and Shepherd hypothesized that early intervention for reading problems could diminish or prevent the cascade of negative effects associated with failure to read. Lyon (1996) pointed to another reason for early intervention when he maintained that remediation becomes more difficult and has a lower rate of success the longer children with a reading disability, at any level of severity, go without identification and intervention. In Uhry and Shepherd’s study, younger children (7 years) made treatment gains quicker than older children (11 years) in a comparison study.

Despite the need for early identification and intervention, most school districts do not identify learning disabled students until they are reading well below grade level; in most cases, identification takes place in grades 3 to 6 (Lyon, 1996; Vadasy, Jenkins, Antil, Wayne, & O’Connor, 1997a). This does not have to be the case, however, as
students with reading disabilities can be identified much earlier (Uhry & Shepherd, 1997). Current research has shown that deficits in phonological awareness (a strong indicator of reading disability), can be identified in late kindergarten and early first grade using inexpensive, straightforward testing protocols (Lyon). In a study conducted by Hurford, Schauf, Bunce, Blaich, and Moore (1994), discriminant analysis was very accurate in identifying poor readers at the end of second grade based on data taken two years previously. Hurford et al. proposed that measures of intelligence, reading, and phonological processing taken at the beginning of first grade reliably identify reading disabled children. The literature therefore appears to support both the need for early identification of reading disabilities and the existing capability to do so. The current intervention was conducted with first graders who were identified by their teachers and principals as being most at-risk for reading failure.

The majority of reviewed articles appear to agree on two issues: (a) reading disabled children require explicit, direct instruction that is intensive, focused, and not of brief duration; and, (b) early identification and intervention could possibly prevent reading disabilities, or at least reduce their magnitude. Because some students cannot decode phonetically after years of remediation (Lovett, Warren-Chaplin, Ransby, & Borden, 1990; Uhry & Shepherd, 1997), such disabled readers may be best served by initial instruction based on their strengths, using their compensation strategies, such as sight word memorization.

The use of a rebus-based program to teach 150 initial sight words resulted in initial success experiences for targeted students (Biemiller & Siegel, 1997). A more
direct approach to sight word acquisition, the *Edmark Reading Program* (1992) was used to develop an initial 150-word sight vocabulary using Level I of the program. This intervention provided beginning success experiences and reading practice while phonological and metacognitive strategies were being taught over the long period of time the literature suggests is needed to remediate reading disabilities. The intervention was designed to be consonant with the basic special education principle of building on strengths while remediating weaknesses, and, by being employed early in first grade, sought to prevent or ameliorate the poor self-esteem and low motivation that result from reading failure (Lyon, 1996).

**Theoretical Framework**

The proposed intervention was based on the consensus in the literature that reading disabled children require explicit, direct instruction that is intensive, focused, and not of brief duration (Swanson, 1999). Direct instruction has its theoretical origins in the work of behavioral psychologists, such as Pavlov, Thorndike, and Skinner. The instructional design principles proposed by behavioral psychologists focus on conceptualizing learner goals and tasks, breaking tasks into small components, developing instructional activities that ensure mastery of each component, and arranging the entire instruction into sequences so that prerequisite learning comes before more advanced instruction (Skinner, 1968).

Theories of direct instruction focus on a high degree of teacher direction and control, as well as high expectations for pupil progress (Marston, Deno, Kim, Diment, & Rogers, 1995). The model is based on four assumptions: (a) all children can be
taught, regardless of their developmental readiness or background, (b) learning basic skills is central to intelligent behavior, (c) disadvantaged children tend to be behind in skills needed for school success, and (d) in order to reach the level of advantaged students, disadvantaged students must be taught more in the time available (Becker, 1977). The academic focus in direct instruction emphasizes the academic task at hand, and discourages the use of nonacademic materials or personal discussions between student and teacher. Maximization of a student’s time on task is stressed, as is a student’s experiencing a high rate of success, such as 80% mastery or better (Becker; Bloom, 1971b).

Direct instruction also embraces the principle of shaping, as the instructor moves the student from highly structured practice, to semi-independent or guided, to independent practice (Joyce & Weil, 1996). In the Edmark Reading Program’s (1992) errorless discrimination method, each new word is introduced in isolation and the student is instructed to point to the word. The student then points to the word surrounded by non-word groups of letters, and then selects the word from among two distracter words. Next, the student reads the word in isolation, followed by reading the word in sentences. Comprehension activities then test the student’s understanding of the word and its meaning. Finally, each newly introduced word is reviewed in the next lesson and appears frequently throughout the remainder of the program.

The mastery learning involved in the proposed intervention is based on the work of John Carroll (1971) and Benjamin Bloom (1971b; 1977b; 1979; 1986; 1988). Carroll developed a conceptual paradigm which maintained that learning is a function
of the time allowed the learner, plus his perseverance, interacting with his aptitude, ability to understand instruction, as well as the quality of instruction he receives. Bloom then transformed Carroll’s conceptual model into a working model for mastery learning in the seminal article he published in 1968. In “Mastery Learning,” his 1971 adaptation of that work, Bloom maintained that approximately 95% of students can learn subjects taught in the public schools to a high level of mastery, given sufficient learning time and appropriate types of help. Bloom believed that brief diagnostic tests should serve as formative evaluation, and knowledge of progress should be given to students as reinforcement. The Edmark Reading Program (1992), in which each student works at his or her own pace, tests each 10 words presented, and students receive immediate feedback after each response and each test.

Bloom (1971a, 1977a) viewed one of the important effects of mastery learning as its positive outcome on students’ self-concepts. Because no one is judged as frequently at any other point in his or her life as in school, children who experience failure often experience a systematic destruction of their self-concepts. Bloom believed that children’s feelings of inadequacy in school, corroborated by failing grades, would result in negative views of school and learning itself, and ultimately, to negative self-concept and impaired mental health. Conversely, Bloom proposed that providing success experiences for children through mastery learning strategies could provide a type of “immunization against mental illness” (1977a, p. 197). It was thus hypothesized that if the intervention were to prevent reading failure in experimental group
participants, it was also possible that their views of reading in particular and school in general could be improved.

**Research Hypotheses**

Based upon a review of current literature concerning sight word recognition in at-risk readers, as well as the researcher's experience using the *Edmark Reading Program* with special education students in first through third grades, the following research hypotheses were proposed:

**Hypothesis 1:** There will be a statistically significant difference in the level of word recognition, as measured by the Word Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

**Hypothesis 2:** There will be a statistically significant difference in the level of word recognition, as measured by the Level 1 Posttest of the *Edmark Reading Program*, between the experimental group and the control group.

**Hypothesis 3:** There will be a statistically significant difference in the level of reading comprehension, as measured by the Passage Comprehension subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

**Hypothesis 4:** There will be a statistically significant difference in the level of letter identification, as measured by the Letter Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.
Hypothesis 5: There will be a statistically significant difference in the level of phonetic decoding, as measured by the Word Attack subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Null Hypotheses

In order to determine the effect of one-on-one tutoring in sight word recognition on the reading performance of first grade students at-risk for reading failure, the following null hypotheses were tested:

Hypothesis 1: There is no statistically significant difference in the level of word recognition, as measured by the Word Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Hypothesis 2: There is no statistically significant difference in the level of word recognition, as measured by the Level 1 Posttest of the Edmark Reading Program, between the experimental group and the control group.

Hypothesis 3: There is no statistically significant difference in the level of reading comprehension, as measured by the Passage Comprehension subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Hypothesis 4: There is no statistically significant difference in the level of letter identification, as measured by the Letter Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.
Hypothesis 5: There is no statistically significant difference in the level of phonetic decoding, as measured by the Word Attack subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Research Questions

The following research questions were addressed by analyzing the qualitative data collected during the study:

1. Will a pattern of responses concerning the reading performance of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the *Edmark Reading Program* and for those who do not receive supplemental instruction in the *Edmark Reading Program* for one semester?

2. Will a pattern of responses concerning the attitudes toward reading of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the *Edmark Reading Program* and for those who do not receive supplemental instruction in the *Edmark Reading Program* for one semester?

3. Will a pattern of responses concerning the attitudes toward school of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the *Edmark Reading Program* and for those who do not receive supplemental instruction in the *Edmark Reading Program* for one semester?
Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester?

4. Will a pattern of responses concerning the attitudes toward self of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester?

Definitions

For the purposes of this study, the following terms are defined:

At-risk for reading failure - Students who ranked in the lowest 20%-30% of entering or repeating first graders at the participating schools, based on informal teacher assessment of group participation and reading skills, and scores on nine unit tests from the HBJ Treasury of Literature (Farr & Strickland, 1993), kindergarten level for entering first graders, and first grade level for repeating first graders. While the literature contains many definitions of "at-risk," most share the common meaning of students who have a high probability of academic failure and of eventually dropping out of school (Ross, Smith, Casey, & Slavin, 1995).

Basal Readers - Graded reading textbooks used for classroom reading instruction which are sequentially developed, beginning with the readiness level and extending through 6th or 8th-grade-level (Stoodt, 1981). In the present study, the basal
reader used by the participating school district was the 1993 edition of Farr and Strickland’s *HBJ Treasury of Literature*.

**Dolch List** - The Dolch Basic Sight Vocabulary, a list of high-frequency words most useful for remedial students, preprimer through grade 3 (Richek, List, & Lerner, 1983). Dolch stated these 220 words make up from 50-75% of all ordinary reading matter, and should therefore be recognized instantly by sight by all school children (Dolch, 1955). The list does not include nouns because, according to Dolch (1950), nouns are tied to special subject matter, activities, or interests.

**Edmark Reading Program** (1992) - A carefully sequenced, highly repetitive sight-word program recommended for use with preschool students aged three through five years, elementary students having difficulty mastering reading, ESL students, and most special education students. Published by Edmark Corporation, the program was first commercially available in 1972; the second edition (1992) will be used in the proposed research. The program consists of Level 1, containing 150 basic sight words plus endings (-s, -ed, -ing) and Level 2, containing 200 additional words (Edmark, 1992). See Appendix A for a more complete description of the program.

**Errorless discrimination** - Initially defined by Terrace’s (1963) work with discrimination learning with and without errors in pigeons, errorless discrimination refers to the acquisition and maintenance of a discrimination without responding to S- (another stimulus other than the target stimulus). Prior to Terrace’s work, it was believed that extinction of responding to S- was a necessary condition of the formation of a discrimination. The *Edmark Reading Program* (1992) utilizes errorless
discrimination in its method of teaching words through shaped sequences of visual and auditory-visual matching-to-sample, with the target word (S+) initially appearing alone, and eventually, with orthographically similar words (Walsh & Lamberts, 1979).

**Grapheme** - A written phoneme, such as “t” (Stoodt, 1981).

**Grapheme-Phoneme Connection** - A letter-sound relationship; for example, the letter $t$ represents the sound $/t/$ (Stoodt, 1981).

**Learning disabilities** - While many definitions of learning disabilities are found in the literature, the most common is a severe discrepancy between achievement and intellectual ability in one or more of the following areas: (a) oral expression, (b) listening comprehension, (c) written expression, (d) basic reading skill, (e) reading comprehension, (f) mathematical calculation, or (g) mathematical reasoning (Fletcher, Francis, Rourke, Shaywitz, & Shaywitz, 1992). Because of the lack of agreement of a universal definition, different states, books, and journals have operationalized a variety of definitions.

**Metacognition** - An individual’s awareness of and ability to monitor and adjust his or her cognitive actions in learning (Swanson & Alexander, 1997).

**Neverstreaming** - Robert Slavin’s term for his philosophy of early, intensive intervention with at-risk students in order to keep them out of the special education system. Neverstreaming stands in contrast to the traditional philosophy of special education placement, remediation, and mainstreaming back in to the regular classroom (Slavin et al., 1996).
One-on-one tutoring - The 15-minutes per day of one-on-one instruction in the *Edmark Reading Program* (1992) given by volunteer tutors to each experimental group student, Monday through Friday, for the first semester of the 1999-2000 school year.

Orthographic processing - Understanding writing conventions of the English language and correct and incorrect spellings (Swanson & Alexander, 1997).

Phoneme - The smallest unit of sound in the English language (Stoodt, 1981).

Phonemics - The sound system necessary to pronounce the English language (Stoodt, 1981).

Phonics - The study of the relationship between spoken sounds and written words; it involves the analysis of whole words into smaller units (Stoodt, 1981).

Phonological Processing - The association between sounds and letters; the understanding of the grapheme-phoneme conversion rules and exceptions to the rules (Swanson & Alexander, 1997).

Reading disabilities - Traditionally, children who have exhibited a discrepancy between their intelligence levels and reading achievement have been classified as reading disabled (Hurford, Schauf, Bunce, Blaich, & Moore, 1994). Children with reading disabilities have been described as individuals who have unusual difficulty learning to read, despite adequate or even above-average intelligence (Spear-Swerling & Sternberg, 1994). The review of literature examines in detail the debate over the validity of the discrepancy formula in identifying disabled readers. For the purpose of this study, disabled readers are defined as children whose poor reading abilities prior to
intervention were resulting in failing or near-failing grades in their reading classrooms
and/or standardized test scores in reading which would prevent their promotion to the
next grade.

Reading failure - Reading failure in this study was determined by scoring below
75% of correct responses on the nine HBJ (Farr & Strickland, 1993) unit tests given in
kindergarten or those given in first grade for repeaters.

Reading performance - Reading performance in this study was determined by
(a) posttest scores on the WRMT-R, Form H (Woodcock, 1987), and (b) number of
words read correctly on the Level I posttest of the Edmark Reading Program (1992).

Rebus Method - Using concrete symbols or pictures as substitutes for certain
words in sentences (Richek et al., 1983).

Semantic Processing - Understanding the meaning of words (Swanson &
Alexander, 1997).

Sight word recognition - Recognizing words without resorting to any apparent
use of strategies, such as decoding or context (McCormick & Becker, 1996) and
pronouncing them orally (Johnson, 2000).

Working Memory - A mental processing resource of limited capacity, which is
relevant to reading, measured by the ability to retain information in memory while
simultaneously processing other information (Swanson & Alexander, 1997).
CHAPTER II

REVIEW OF RELATED LITERATURE

Children identified as having a learning disability (LD) currently comprise approximately one-half of the special education students in the United States, or about 5% of the total public school population (Lyon, 1996). According to Secretary of Education Richard W. Riley (1996), these 2.5 million students exhibit poor school performance and completion, fewer than half of LD students ever graduate with a regular diploma (Palinscar, 1997).

The majority of children with learning disabilities exhibit their primary skill deficits in basic reading skills. The problem of reading disability is chronic and pervasive; under even ideal circumstances, reading disabled children do not usually catch up with their non-disabled peers, and many actually become worse over time (Aaron, 1997; Cunningham & Stanovich, 1998; Stanovich, 1986; Torgeson, 1998). Longitudinal studies show that 74% of students identified in third grade remain reading disabled through ninth grade, after receiving special education services (Lyon, 1996). While even subtle reading deficits require the expertise of a teacher competent in reading remediation, special education teachers are seldom well-versed in this area. Aaron reported the disturbing fact that some studies actually show small, but significant negative correlations between the amount of time spent in resource rooms and reading
achievement. He refers to special educators' knowledge of the law and the processes of identification, placement, and consultation as distinguishing them from other educators, rather than a knowledge of effective teaching techniques for the remediation of reading disabilities in LD students.

In their analysis of the instructional experiences of 16 second grade at-risk readers in Title 1 and special education classrooms in two school districts, McGill-Franzen and Allington (1990) concluded that neither special setting provided more individualized instruction than the regular classroom. Instead, the students' reading and language arts instruction depended less on their classification as handicapped or remedial than on the configuration of instruction within their school district. This finding supported Haynes and Jenkins' (1986) earlier research of 28 special education resource rooms in two school districts which revealed that reading instruction in these special settings was not strongly linked to student characteristics. The authors witnessed students spending the majority of their time doing individual seat work, while engaged in little reading, and concluded that the level of instruction was insufficient to close the gap between the achievement of handicapped students and their non-handicapped peers.

In their examination of recent research on reading instruction for children with special learning needs, Torgesen, Wagner, and Rashotte (1997) also concluded that teachers are not well trained in the knowledge base and instructional skills essential to adapting reading instruction for children who do not learn easily. In addition, the authors stated a belief that major gaps still exist in knowledge of how to teach reading
effectively to the 3% to 5% of children with the most severe reading disabilities. Special education itself has come under widespread attack for failing to achieve academic outcomes commensurate with its $60 billion per year budget (Finn, 1996; Gubernick & Conlin, 1998; Krantz, 1998).

With the current emphasis on inclusion and the regular education initiative, general education teachers as well as special education teachers require information on the most effective strategies in teaching the reading disabled. The purpose of this review of related literature was to explore current research on the teaching of word recognition. The focus of the current research was placed on word recognition because it is a precursor to reading comprehension, and therefore, if a child has difficulties in both word recognition and comprehension, improvement of the former skill should be first priority (Aaron, 1997; Ehri & Saltmarsh, 1995). Levy et al. (1997) described some agreement in the literature that children should not be asked to read texts containing high proportions of unfamiliar words, because doing so renders them unable to focus attention on meaning processing. Conversely, improving word recognition and reading fluency leads to increased comprehension. Torgesen et al. (1997) also maintained that weaknesses in phonetic reading skills may be compensated for by strengths in vocabulary size, amount of print exposure, or effective use of context. They cite one advantage of preventive programs for at-risk children as the students possibly not requiring unusually explicit instruction in reading comprehension if normal development of their word-reading abilities can be fostered.
Learning Disabilities

Lyon's (1996) statement that the field of LD "continues to be beset by pervasive, and occasionally contentious disagreements about the definition of the disorder, diagnostic criteria, assessment practices, treatment procedures, and educational policies" (p. 55) sets the tone for an exploration of the literature. The lack of treatment uniformity by special educators becomes more and more understandable as the lack of agreement on almost any point, from etiology to intervention, is reviewed in current journals.

Definitions and Diagnostic Criteria

The statutory definition of learning disabilities contained in the Individuals with Disabilities Education Act (IDEA) describes a disorder in one or more basic psychological processes involved in understanding or using spoken or written language. An important part of the IDEA definition is exclusionary: the learning problems cannot primarily result from visual, hearing, or motor disabilities, mental retardation, emotional disturbance, or environmental, cultural, or economic disadvantage (Lyon, 1996). The federal definition thus focuses on a discrepancy between a child's academic achievement and his capacity to learn. Most states seek this discrepancy between intelligence quotient (IQ) and achievement, but there is wide variation in how the discrepancy is derived and quantified (Lyon). In Louisiana, for example, Bulletin 1508 of the Louisiana Pupil Appraisal Handbook mandates a discrepancy not between IQ and achievement, but between two different academic areas. One area (weakness) must be measured at 2 standard deviations below the mean, and one area (strength) must be
less than 1 standard deviation below the mean (Cawley, Miller, & Carr, 1990). Because of the variation in state definitions, a child can easily be diagnosed as LD in one state and not meet a neighboring state’s criteria for special education services.

**Perceived Etiologies and Implications for Treatment**

A significant theme in the current literature is dissatisfaction with the prevalent classification of children as reading disabled and/or learning disabled based upon a discrepancy between reading achievement and intelligence scores. Aaron (1997) strongly advocated for the abandonment of the discrepancy formula as he reviewed over 100 research studies that invalidated its two premises: that the etiologies of LD poor readers and non-LD poor readers are different, and that the two categories of poor readers require different remedial treatment. In the majority of schools in the United States using the discrepancy formula, children who meet the LD criteria are served in one of four primary settings: LD resource rooms, self-contained special education classrooms, regular classrooms (inclusion), or special tutoring. Poor readers without LD are instructed in the regular classroom and may sometimes receive Title I services. According to research cited by Aaron, instructional methods that disregard the LD-non-LD distinction and focus remedial efforts on the cause of the reading problem are generally successful in improving reading achievement.

In a study investigating the cognitive ability, academic achievement, and social-behavioral competencies of a group of 80 students referred for academic problems, Merrell and Shinn (1990) compared data on those areas to learning disability classification decisions. The researchers concluded that while the school district in their
study used a discrepancy factor in their LD eligibility guidelines, the majority of
students classified as LD did not meet that criteria. Instead, the most critical variable in
the LD classification decision was low academic achievement, while teacher referral
was identified as a powerful variable in identifying struggling students.

In a similar earlier study, Algozzine and Ysseldyke (1983) analyzed
psychometric tests of two groups of fourth graders, 80 in one group and 51 in another,
who had been identified by their school systems as being LD or low achievers. An
analysis of data revealed that children with and without discrepancies had been
classified as learning disabled by their districts, and many of the low-achieving children
would have met the LD discrepancy guidelines. These findings led Algozzine and
Ysseldyke to call for the expenditure of less energy in answering the who, why, and
how of learning disabilities, and more effort in determining what to do with all students
who are not benefiting from their current reading programs. In an article which set the
direction for much of the research to follow, Algozzine (1985) proposed that the
application of the discrepancy criteria did not produce a unique group of students, and
that, therefore, the category of reading disabled was failing to be useful. Instead, he
called for the provision of services to all low achievers who required specialized
assistance in reading.

In 1990, Merrell administered the Woodcock-Johnson Psycho-Educational
Battery to 245 students in grades 2 through 8 to investigate differences between groups
of LD and low achieving (LA) non-handicapped students. While he found significant
differences between LD and LA students on all but one Woodcock-Johnson subtest,
the ability-achievement discrepancy scores did not differ to the extent that some of the academic achievement variables did. In addition, Merrell agreed with the previously cited researchers that the discrepancy criterion had been applied inconsistently in the classification of children as LD.

To address the validity of distinguishing children with reading disabilities based on the discrepancy between intelligence and achievement, Fletcher, Francis, Rourke, Shaywitz, and Shaywitz (1992) compared children who had been classified using the discrepancy formula on ten neuropsychological tests. The researchers failed to find large differences between low achieving children and those who had met the discrepancy-based criteria for labeling as reading disabled. The results caused the authors to question the validity of segregating children with reading deficiencies according to discrepancies between achievement and IQ scores.

In their study of 436 twins, Pennington, Gilger, Olson, and DeFries (1992) attempted to examine the external validity of the discrepancy definition of reading disabilities. While the authors discovered some relationship between genetic and neuropsychological profiles and the classification of children based on age- and IQ-discrepancies, they argued against withholding treatment from children who do not display the discrepancy. Pennington et al. cautioned that reading treatment can be especially efficacious with children not meeting the discrepancy criteria due to "average" reading skills.

In a longitudinal study of 1,284 elementary school children followed from kindergarten through 4th grade, Vellutino et al. (1996) also questioned the utility and
widespread use of the IQ-achievement discrepancy definition of reading disability. Their data suggested that the kind of linear relationship between IQ and reading ability assumed by IQ-achievement discrepancy definitions do not exist. Instead, the authors believed their data supported the premise that many of the skills and abilities evaluated by intelligence tests are not as important for success in beginning reading as are phonological skills, such as phoneme segmentation, phonetic decoding, and name encoding and retrieval. Vellutino et al. concluded that the adverse effects of inadequate prereading experiences and/or inadequate instruction can mask or mimic the effects of constitutionally-based cognitive deficits.

Further support for claims of the lack of validity of the discrepancy standard is found in National Institute of Child Health and Human Development-supported studies summarized by Lyon (1996). Research groups from Yale, the University of Ontario, Bowman Gray, and the University of Colorado have found that disabled readers both with and without the IQ-achievement discrepancy show similar information processing, genetic, and neurophysiological profiles. The studies indicated that phonologically-based reading disabilities are linked to neurobiological and genetic factors. Thus, some children have biologically “real” disabilities, but it is not the LD population alone that fits this category, but reading disabled children (LD or non-LD) with phonological processing problems.

Spear-Swerling and Sternberg (1994) disagreed with the biological etiology of reading disability, and stated that most critics of the biological model agree that only a minority of children classified as reading disabled have problems stemming from a true
biological deficit. Instead, these researchers stressed that environmental factors of instruction and home situation should be more closely examined as possible explanations for reading deficits. Kershner (1990), on the other hand, accepted the theory of underlying neurological inefficiency that affects domain-specific, cognitive processes such as phonological decoding, but only in relation to LD children. The key notion of specificity—that these neurologic deficits are specific to LD children—has long defined and rationalized the very concept of learning disabilities.

Another branch of research compromising the specificity theory has explored a deficit in the general working memory (g) system as well as the isolated system of phonological coding. Swanson and Alexander (1997) examined correlations between phonological, orthographic, semantic, metacognitive, and working memory measures with reading performance. Participants were 40 LD and 40 skilled readers, ages 8 to 12 years. Reading ability group differences emerged on working memory measures (g), which were also found to best predict both reading comprehension and LD readers' pseudoword performance. Based on their data, the researchers proposed that LD readers' information processing difficulties were best described within their working memory model. Working memory allows the students to hold a small amount of material in mind for a short time while simultaneously carrying out further operations—a skill critical to reading, where incoming information must be temporarily preserved while other information is being acquired or manipulated.

Swanson and Alexander (1997) reported four findings that emerged from their extensive statistical analyses of collected data. First, LD readers of average intelligence
are deficient on multiple cognitive processes when compared with skilled readers, and the severity of their reading deficit is more likely a reflection of a general rather than specific component process. Second, the majority of processing variables load on a common component, g, which was interpreted as representing a general working memory resource system. Third, in both groups of readers, the general system (g) was more likely to predict reading comprehension than were specialized processes. Finally, while the phonological awareness component best predicted skilled readers' pseudoword decoding, the general component (g) better predicted pseudoword decoding in LD readers. The authors interpreted these findings as demonstrating no one cognitive process dominates in prediction of reading difficulties, but rather, the working memory system best explains the reading process. Unfortunately, they did not discuss the implications of this theory to effective teaching of LD readers, nor did they include non-LD poor readers in their participant population.

In summary, definitions of and diagnostic criteria for the identification of learning disabilities varies among states. While the federal definition of LD is based on the discrepancy between ability and achievement, that discrepancy formula has been challenged (Aaron, 1997; Algozzine & Ysseldyke, 1983; Fletcher et al., 1992; Merrell, 1990; Merrell & Shinn, 1990; Pennington et al., 1992; Vellutino et al., 1996). The call in the literature to replace the discrepancy model could end the perhaps unnecessary labeling of children, and more importantly, could result in a re-structuring of special education that could provide specialized reading instruction to all children who need it, rather than those meeting non-uniform, arbitrary LD criteria. Such researchers as
Aaron (1997) and Lyon (1996) believe a biologic basis for reading disabilities exists, but it is found in both LD and non-LD poor readers. Research such as Kershner's (1990) supported the traditional theory that a biological etiology sets LD children apart from non-LD students. In contrast, Spear-Swerling and Sternberg (1994) maintained that a biologic deficit is rare in LD children, and environmental causes are much more prevalent. While Swanson and Alexander (1997) do not challenge the specificity theory, they depart from the predominant belief that phonological deficits are the major cause of reading difficulties, and instead, propose a general working-memory system (g) deficit as best predicting reading disabilities.

**Methods of Intervention**

The lack of consensus concerning the etiology of learning disabilities and predictive correlates of reading problems is further reflected in the wide variety of models considered to be most effective in remediating reading disabilities. While the majority of researchers promote direct teaching methods, indirect strategies are infrequently suggested (Becker & McCormick, 1991). Models of delivery range from whole class instruction to small groups, to one-on-one interventions.

**Review of Research: 1979 to 1994**

In 1996, McCormick and Becker reviewed all research published between 1979 and 1994 in *Learning Disability Quarterly* and the *Journal of Learning Disabilities* which addressed word study with learning disabled students in general education classrooms, resource rooms, and tutorial settings. These 27 studies were reviewed
according to their emphasis on either word recognition, which the authors defined as recognition of words at sight without resorting to any apparent use of strategies (18 studies), or word identification: the use of one or more strategies to identify unknown words (10 studies; one study explored both word recognition and word identification). Under the area of word recognition, McCormick and Becker (1996) reviewed studies exploring the degree and kind of guidance most effective when LD readers do not correctly recognize words in text, such as various forms of miscue correction. Their ultimate conclusion was that, with some exceptions, there are more similarities than differences in what fosters word recognition and identification with both LD and non-LD students.

Selected Research: 1994 to Present

A selected review of literature on word recognition in LD students from 1994 to the present revealed the same diversity of focus as that explicated by McCormick and Becker (1996). Spear-Swerling and Sternberg (1994) presented what they consider an integrative theoretical model which conceptualizes reading disabled children as normal youngsters who have left the road to proficient reading at one of several predictable points. The point at which LD children deviate from the path of normal reading acquisition determines four possible patterns of performance (nonalphabetic, compensatory, nonautomatic, and delayed readers) which, in turn, dictate the teaching strategy most effective for that particular child. The authors embraced a verbal-deficit view, focusing on phonological problems, and posited that their four patterns of
reading disability all depart from normal reading acquisition at the word recognition level.

In the Spear-Swerling and Sternberg (1994) model, nonalphabetic readers have no knowledge of the alphabetic principle, lack phonological awareness, and rely on cues such as pictures and word shape. They therefore benefit most from activities to promote phonological awareness, letter-sound knowledge, and understanding of the alphabetic principle. The theorists recommend integrating training in phonological awareness with explicit instruction in letter sounds and decoding in working with nonalphabetic readers. Compensatory readers "go astray" in the next phase, phonetic-cue word recognition, and tend to compensate with sight-word knowledge or contextual skills. Effective teaching with this sub-group of disabled readers includes direct instruction in decoding skills, as well as encouragement in applying the skills when reading in context, rather than guessing at words. Next, nonautomatic readers diverge from the road to proficient reading in the phase of controlled word recognition. They can decode words accurately, but not automatically, without effort. Like compensatory readers, they may use sentence context to speed their labored word recognition efforts. Automatization of decoding skills through increased practice reading and motivation are listed as most effective teaching strategies with non-automatic readers. Finally, delayed readers achieve accurate and automatic word-recognition skills, but they use so much time and energy to do so, they are not ready for comprehension instruction when it is being taught. These children do not become strategic readers without intervention, because they lack the kinds of reading
experiences that would encourage them to generate and use strategies. Such readers therefore require direct instruction in reading strategies and higher level comprehension skills.

In summary, Spear-Swerling and Sternberg's (1994) eclectic model advocates a combination of whole language techniques (early writing, integration of reading with other subjects, and motivational reading materials) with a strong decoding program for the most effective education of reading disabled students. The major weakness of their model may be its purely theoretical nature. While the authors extend their patterns of reading difficulty to the type of remediation best used for each, they presented no empirical research to validate the efficacy of the interventions listed.

Initial word learning strategies. The literature also contains reports of experimental programs that are narrow, and often unique, in focus. Biemiller and Siegel (1997) compared whole language reading instruction as implemented in two low SES schools to the use of the Bridge program, which uses icons or picture symbols to facilitate word identification. Echoing Swanson and Alexander's (1997) theory of a general working memory deficit in LD readers, this approach was designed to reduce the cognitive load in working memory in word identification tasks. To accomplish this, nouns, verbs, and adjectives are initially paired with icons, which are gradually faded. This procedure is designed to ensure success in deriving meaning from written language, and its main goal is to achieve a sight vocabulary of 150 words from the Dolch list. The rationale behind this intervention is that by the time at-risk readers
mature sufficiently to profit from regular reading instruction, they will have already achieved a reading vocabulary of 150 words and a sense of success in reading.

Results of Biemiller and Siegel's (1997) one-year intervention (replicated in year two in other classrooms) with 42 experimental and 64 control group students indicated significant differences in word identification in favor of the *Bridge* program at the end of first grade, and a more substantial difference at the end of second grade. No significant effects were found for decoding or reading comprehension. The researchers concluded that the superior word-identification skills in grade 2, a year after the intervention, suggested that acquiring a larger sight word vocabulary in first grade helped the children profit more from the whole language instruction they received in second grade. The authors believe that phonemic training is better introduced when the students have some sense of what reading is and what the value of decoding would be. Biemiller and Siegel do not, however, address how the *Bridge* program differs from other rebus-based programs, or why it would be superior. In addition, they do not consider the possibility that the efficacy of other, more direct approaches to teaching a basic 150 sight word vocabulary (such as the *Edmark Reading Program*, 1992) should be compared to the *Bridge* program's icon-based method. Other possible weaknesses of the study appeared to be its failure to randomly assign students to treatment or control groups, as well as its choice of control setting: whole language classrooms in which phonics was not taught. Results of the study may have changed had the whole language classrooms followed standards of best practice and incorporated phonetic training.
Coming from a similar theoretical base, Levy et al. (1997) examined the relationship between word identification speed, story reading fluency, and comprehension. Forty grade 4 poor readers were trained on 72 target sight words and subsequently engaged in repeated readings of two stories, one with and one without the target, trained words. Results showed that fluency gains in context-independent word recognition (obtained through single-word reading practice) generalized to reading those words in context, as measured by reading time and accuracy. Perhaps most importantly, faster word recognition resulted in improved story comprehension, suggesting that fluency gains through single word training can facilitate improved comprehension.

Levy et al. (1997) theorized that the bottleneck created by slow word identification prevents the proper operation of syntactic and semantic processes used in comprehension. Reminiscent of Swanson and Alexander's (1997) theory of general working memory, Levy et al. believe that while fluency does not cause increased comprehension, it enables the higher order comprehension operations to function. Based on these findings, the researchers recommended the combined use of single-word practice and rereading of stories with controlled vocabulary as the ideal procedure. They believe once a student has some basic word recognition fluency, which enables the comprehension of texts, a broader selection of literature may then be added without confusing the problem reader. Credibility of Levy et al.'s findings could have been improved by the use of a control group and expansion of the subject pool beyond grade 4. Would these findings generalize to grade 1 students, for example, or are grade
4 pupils at a developmental stage most amenable to this type of training? The authors do not explain why grade 4 was selected as their target population, nor do they reveal how many, if any, of the 40 poor readers in the study were classified as LD.

Addressing the issue of how to train the initial sight words, Belfiore, Skinner, and Ferkis (1995) compared the effects of trial repetition and response repetition on sight-word recognition. In the trial-repetition training, students were asked to identify a sight word. If incorrect, the instructor would say, “No, the word is _____,” and have the student repeat the word. The procedure was repeated until five trials were given in each training session. In the response-repetition condition, an incorrect response resulted in the student being told the correct word and asked to repeat it four times. Results indicated that for all three participating students, the trial-repetition condition resulted in consistently higher learning rates than the response-repetition trials. The researchers suggested that educators focus on increasing the number of learning trials rather than merely increasing the number of accurate responses in sight-word training. The extremely small number of participants in this study (3), however, severely limited the scope of its generalization as well as its validity.

Another intervention based on creating immediate success for reading disabled students was studied by Rankhorn et al. (1998). The “failure free” reading program was used to supplement instruction of 39 learning disabled third, fourth, and fifth grade students for 7 months, 30 minutes per day. The primary instructional procedure involved previewing material to be read; listening to the teacher read; answering factual, inferential, and learning questions; reading the material; and reviewing the
material. The approach claimed to reduce reading to its simplest form by controlling for context of the material, sentence structure, and story content, and by emphasizing repetition.

Results revealed an average grade-equivalent improvement of 9 to 18 months in posttest reading ability scores, a gain the authors compared to Reading Recovery results (Rankhorn et al., 1998). The researchers maintained the “failure free” reading program followed a simple, direct method, using carefully constructed passages of connected text, and avoided the disadvantage of many global tutoring programs (e.g., Reading Recovery): one-on-one instruction, extensive training needs, and cost. Study limitations included the absence of a control group and the failure to specify the size of the small groups in which the program was delivered. The researchers also failed to address the 31% of participating students who still exhibited severe discrepancies in reading achievement at the conclusion of the intervention. Participating students were described as special education students with severe reading disabilities, but what constituted “severe” was never discussed. Finally, although not disclosed in the article itself, but only in the reference list, the newly developed commercial product, the “failure free” reading program, was created by Joseph F. Lockavitch, one of the article’s authors, thus raising the question of researcher bias.

In summary, two reviewed studies addressing initial word learning strategies agreed that providing initial success experiences for beginning readers is crucial (Biemiller & Siegel, 1997; Rankhorn et al., 1998). Researchers differ, however, on the best technique to ensure that success. While Biemiller and Siegel advocated the use of
sight word training using a rebus-type program, Rankhorn et al. provided success through control of context, sentence structure, story content, and repetition. Other researchers have focused on smaller pieces of the puzzle: Belfiore et al. (1995) advocated for an increase of learning trials, while Levy et al. (1997) promoted word identification speed as the key to increased fluency and comprehension.

**Phonetic analysis strategies.** Taking a more traditional, direct approach to remediating phonological deficiencies, Uhry and Shepherd (1997) hypothesized that 12 first and second grade dyslexic students with deficits in phonological processing could be taught to use phonological decoding strategies. Their one-on-one direct instruction tutorials included training phonological awareness through instruction in segmenting and spelling, letter-sound associations, and guided reading using phonics-controlled and narrative-controlled text. Their intervention was based on an alternative conceptualization of sight vocabulary: rather than being separate processes, recognition of sight words is facilitated by a network of connections, some of which link orthography and phonology. In this view, almost all English words allow for at least partial use of grapheme-phoneme connections, which then facilitate rapid recognition of words. This model predicts that early phonological awareness training would also have an impact on sight-word learning, as well as nonword reading.

Results indicated a significant growth in the ability to read words by sight, to read words by phonological recoding, and to spell (Uhry & Shepherd, 1997). Contrary to the traditional model of dyslexia that maintains the ability to recode words phonologically will remain poor even after remediation (due to phonological awareness
deficits), participants’ nonword reading and spelling skills appeared as strong as sight-
word reading after explicit instruction in phonological awareness, phonics, and text 
reading. On the other hand, half of the 12 participating children continued to perform 
below peer norms on tests of phonological awareness, especially in the area of 
consonant clusters. Uhry and Shepherd drew several conclusions from their study. 
First, reading is easier to remediate when caused by phonological-awareness deficits 
alone, rather than with concomitant deficits in phonological coding in lexical access 
(perhaps systematic of a lower level, more generalized deficit in processing speed). 
Second, remediation takes less time in younger children. Finally, direct instruction in 
school appears to support effective one-on-one tutoring. While this was a compilation 
of case studies, the small number of participants and absence of a control group cast 
some doubt on the validity of Uhry and Shepherd’s conclusions. While their treatment 
results were statistically significant, the children remained weak in phonological 
awareness and their standard scores in reading remained discrepantly lower than their 
mean IQ’s after five months of treatment.

In a study designed to evaluate the Dyslexia Training Program (DTP), Oakland 
et al. (1998) studied an intervention which combines phonetic instruction training with 
 multisensory methods to promote nonlanguage mental representations. Based on 
Orton-Gillingham methods, the Dyslexia Training Program provides 350 one-hour 
lessons of highly structured phonetic instruction with a heavy emphasis on the 
alphabetic system. Drill and repetition are used to compensate for deficits in verbal 
working memory, and, according to the authors, multisensory presentations help
anchor verbal information through nonverbal, mental representations. Objectives are highly sequential, and comprehension and metacognitive processes are taught.

The 48 dyslexic students participating in the intervention for 10 months a year for two years received the DTP as their primary form of reading instruction. According to Oakland et al. (1998), this group made significant progress, while the control group displayed little improvement over the two years; while statistics are given for main effect, no grade level gains are reported. In addition, while experimental students reached average levels in their abilities to decode nonsense words and to comprehend what they read, they maintained their below-average levels in word recognition. Strengths of Oakland et al.’s study included length of intervention (two years), addressing of consistency by using videotaped instruction for half the experimental group, and use of a control group. Weaknesses included the inability to control for supplementary reading instruction given outside of the study. The researchers did admit that while reading gains in their experimental group were clinically significant, they were modest (e.g., two thirds of a standard deviation in word recognition) given the duration and intensity of the intervention.

In an attempt to address the substantial cost of one-on-one tutoring programs, Vadasy et al. (1997b) explored the feasibility of using nonprofessional tutors to implement a phonologically-based program. Forty at-risk first graders were randomly assigned to a treatment or control group (which received only the regular reading instruction in their classrooms). Tutors implemented 100 30-minute lessons, which focused on letter sounds and beginning sound instruction, rhyming, auditory blending,
segmenting, spelling and analogy use, story reading, and writing. Tutors, who consisted of four parents, one grandparent, one community-college student, and four high-school students, were paid a nominal hourly wage.

While the treatment group outperformed the control group on all reading, decoding, spelling and segmenting, and writing measures, differences were significant on only one nonword reading and one spelling measure (Vadasy et al., 1997b). The researchers viewed their most noteworthy finding as being the implication that one-to-one supplemental tutoring in phonetics does not by itself guarantee a strong overall boost in achievement. They theorized that their tutors did not possess the pedagogical and content knowledge necessary to effectively tutor a reading disabled student. Vadasy et al. (1997b) warned that it is critical to carefully select tutors who are highly motivated and who can be trained to dependably and carefully deliver instruction. It is questionable, however, if nonprofessional tutors can be adequately trained in the skills needed to teach Vadasy et al.’s (1997b) phonetic program; while their search for an economical delivery model is admirable, the content of their intervention may not be compatible with delivery by non-teachers. Phonetic remediation is perhaps best left to trained teachers, while nonprofessional tutors could more than adequately present a structured sight word program, such as the Edmark Reading Program (1992).

In summary, while the majority of reviewed literature appears to acknowledge phonological deficits in reading disabled students, phonological training programs have not effected practically significant, substantial gains in reading skills. While Uhry and Shepherd’s (1997) direct phonological recoding training resulted in statistically
significant gains in three reading components, one half of the participating students were still well below peer norms at the conclusion of the intervention. Even the combination of phonetic instruction with multisensory methods (Oakland et al., 1998) left participating students below average levels in word recognition. Vadasy et al. (1997b) explored one-on-one phonetic tutoring by non-teachers as an economical intervention, but resulting small gains pointed to the possible problem of using nonprofessionals to teach complicated phonological skills.

Cognitive strategies. Das et al. (1995) attempted the remediation of decoding deficits using primarily cognitive strategies. The PASS Remedial Program (PREP) was based on four proposed major cognitive processes (planning, attention, simultaneous, and successive (PASS) processing). Using global process training and curriculum-related bridging training, the program did not teach rules, but instead, facilitated application of internalized strategies arrived at inductively for learning word decoding. The researchers assigned 51 grade 4 students to either PREP global and bridging training or to a no-treatment control group. Later, control group members were assigned to global or bridging PREP groups to facilitate comparison of the two training methods.

The PREP global process training consisted of ten tasks designed to remediate successive and simultaneous processing deficiencies; task goals were to provide a scaffolding network giving only the assistance needed for the children to be successful, and to provide a monitoring system of when materials were too difficult or when the children were ready to progress. The tasks included rehearsal, categorization,
monitoring of performance, prediction, revision of prediction, and sounding and sound blending. Rather than being taught the processes, the students were made aware of underlying cognitive processes through discussion of what they did during and after the task. PREP bridging training was not as completely described; bridging components of tasks were merely explained as being designed to aid the student in extending the particular strategy to an academic area, such as word identification.

Results revealed the PREP group improved significantly more at posttest than did the control group, but word attack scores increased significantly at posttest only for the global treatment group (Das et al, 1995). The authors believed the fact that the PREP group achieved significant improvement in both word identification and word attack (9 months’ gain in 6 months) was important, both because it is difficult to show gains in standardized tests of decoding and because the no intervention control group (who progressed 3 months’ gain in 6 months) was receiving special education instruction. The researchers pointed out that while they addressed the attention-control condition by training the control group on the global and bridging components alone, they were still unable to determine if 15 hours of normal classroom instruction given by a teacher to 2 students, rather than the 10 to 12 in the resource room involved, would be as effective as the PREP program.

Perceived weaknesses of the study included no mention of random assignment to treatment and control groups. In addition, the reader was not told if the treatment groups were receiving PREP training instead of or in addition to their regular school reading instruction, as the intervention took place during the school day. The bridging
component of the training was not explained in detail, as was the global component, and the program was implemented by graduate students in educational psychology, not teachers. Perhaps most importantly, while the authors criticized the presence of opinionated and unscientific studies in the literature, they are susceptible to charges of researcher bias, as their reference list revealed J. P. Das' co-authorship of the PASS model (PREP is the acronym for PASS Remedial Program).

**Phonetic analysis and metacognitive strategies.** Direct phonological training and metacognitive strategies were compared in a study by Lovett and Steinbach (1997). In an attempt to address core learning deficits and transfer-of-learning problems contributing to reading acquisition failure, the researchers assigned 122 reading disabled children to one of two forms of word identification training designed to promote transfer of learning (one primarily phonological, one primarily metacognitive) or to a study skills control program. The Phonological Analysis and Blending Direct Instruction Program (PHAB/DI) used a special orthography providing visual cues (e.g., symbols over long vowels, letter size variation, and connected letters) initially. Overlearning, cumulative review, massed practice, and teaching to mastery criterion were utilized. In contrast, the Word Identification Strategy Training Program (WIST) taught children four word identification strategies, word identification by analogy, seeking part of word you know, attempting variable vowel pronunciations, and removing prefixes and suffixes in multisyllabic words. The WIST strategy depends on the successful learning of 120 high-frequency key words (using a whole-word
approach) which are then used in applying the four metacognitive strategies. Those same 120 words were taught in PHAB/DI using a phonetic approach.

Transfer of learning was tested using both words and nonwords (Lovett & Steinbach, 1997). WIST-trained children showed posttest superiority on sound combinations and key words; both WIST- and PHAB/DI-trained students improved significantly on measures of near and far transfer to real words. Only the WIST group was significantly improved in exception word (those words with irregular and less predictable orthography) identification, suggesting the WIST metacognitive decoding strategies generalized to a broader range of real English words. While the PHAB/DI-instructed children were superior in nonword reading, the WIST students also were significantly improved relative to the control group. Lovett and Steinbach interpreted these results as indicating two methods of remediation of dyslexia are possible: both letter-sound and letter cluster-sound segmentation resulted in successful word identification. The success of the WIST program demonstrated the effectiveness of a metacognitive approach. Together, the interventions pointed to the need for training in subsyllabic segmentation, whether it be at the level of letter-sound or larger segments, like onsets and rimes. Finally, no developmental differences were found in the responses to remediation by the subjects, who ranged from grades K to 6.

The study's strengths included its large sample size (122 children) and their random assignment to treatment groups. Not only did the study employ a control group, but it addressed the effect of any one-on-one attention by providing one-on-one instruction in a study skills program to control group members. Participating students
also ranged from second to sixth grade, significantly widening the scope of the
research. An interesting and perhaps valuable extension of the study could have been
the addition of a third treatment group, which received both phonetic and
metacognitive strategy training. Two well-known commercial programs which combine
phonological training and metacognitive strategies are Reading Recovery and Success
for All (Wasik & Slavin, 1993).

In a comprehensive review of literature, Wasik and Slavin (1993) examined and
compiled existing research on the effectiveness of five of the major one-to-one tutoring
programs designed to prevent reading failure in at-risk first graders: (a) Reading
Recovery, (b) Success for All, (c) Prevention of Learning Disabilities, (d) Wallach
Tutoring Program, and (e) Programmed Tutorial Reading. The authors discussed the
emerging belief that because every child can learn, schools have an ethical—and
perhaps legal—responsibility to ensure that every child does learn. Because of the
significant cost of one-to-one tutoring, however, the authors maintained that schools
should be able to judge the effectiveness (in both the short and long-term) of such
programs before investing in them.

In an attempt to synthesize existing data on these interventions, Wasik and
Slavin (1993) utilized best-evidence synthesis, or meta-analysis, to examine all English
language studies evaluating one-to-one reading instruction lasting four weeks or more
for first grade readers; 16 studies met this criteria. Outcomes of the reviewed articles
were statistically presented in effect size, the difference between experimental and
control means divided by the control group standard deviation. While all five programs
examined showed substantially positive results, the authors theorized that the two with the most comprehensive models of reading—Reading Recovery and Success for All—have the most significant impact on students and have effected substantial savings due to fewer grade retentions and special education placements. Both programs combine phonological and metacognitive strategies in their plan of intervention.

In a very comprehensive review of all published and selected unpublished research on Marie Clay's Reading Recovery program, Shanahan and Barr (1995) attempted first to provide an independent analysis of the program, and then give their resulting opinions on its value. The authors used multiple approaches to analyze data from books, articles, and technical reports, including re-analyzing in a more precise manner, combining data across studies or effect sizes, and analyzing data qualitatively. Meta-analysis could not be used due to the small number of studies and insufficient information presented. The authors concluded that while Reading Recovery does bring the reading level of many children up to that of their average peers, it is not the only program to achieve gains that substantial, and it does not work for 10 to 30% of children. While the children helped by Reading Recovery continue to achieve, on average, better than children not enrolled, the size of the effect diminishes substantially from first to third grade. In addition, the per student expenditure for Reading Recovery (over and above the cost of the regular class placement) averages approximately $4,000 per year.

In 1995, Slavin joined Ross, Smith, and Casey in a direct comparison of the benefits of Reading Recovery and Success for All. While Success for All incorporates
one-on-one tutoring, it is designed to improve the reading instruction for an entire K-5 school, including special education students who are taken out of their self-contained classrooms, per the program's neverstreaming philosophy, and treated like all other at-risk children. Unlike Reading Recovery, Success for All is directly integrated with the school's reading curriculum and uses cooperative learning, partner reading, and direct instruction of both phonics and a sight word vocabulary. The program groups students homogeneously into multiage classes based on reading performance for 90-minute daily reading periods. Results of the study showed that Reading Recovery was more effective with tutored students, but Success for All was more effective with nontutored students. Special education students receiving Success for All tutoring, however, scored significantly higher than those who received no tutoring; Reading Recovery does not tutor special education students. The possibility of researcher bias must be addressed when considering these findings, as Robert Slavin is the author of Success for All.

While Lovett and Steinbach (1997) and Das et al. (1995) showed the effectiveness of using metacognitive strategies alone, the researchers failed to explore what added benefit would result from the combination of metacognitive and phonological strategies in the remediation of reading disabilities. While Reading Recovery does combine the two methods, it does not treat special education students and is, in addition, not effective with 10 to 30% of targeted students (Shanahan & Barr, 1995). Because of its exclusion of special education students, Reading Recovery cannot be compared to Success for All in effectiveness with learning disabled readers.
In summary, methods currently in use to remediate deficits in the word recognition skills of learning disabled readers include initial word learning strategies such as sight word training (Rankhorn et al., 1998), sight word training using a rebus-type program (Biemiller & Siegel, 1997), and word identification speed training (Levy et al., 1997). Phonological approaches such as those employed by Uhry and Shepherd (1997) used direct phonological recoding training to address phonological deficits, which are widely acknowledged in the literature. While significant improvements were noted, Uhry and Shepherd's efforts failed to raise half of the participants to average functioning. The combination of phonetic instruction with multisensory methods based on the Orton-Gillingham approach (Oakland et al., 1998) also left students below average levels in word recognition, as did an attempt to have phonetic instruction delivered by nonprofessional tutors. While the efficacy of using metacognitive strategies was shown by Das et al. (1995) and Lovett and Steinbach (1997), the combination of phonological and metacognitive strategies were not explored by the researchers. Although Reading Recovery does combine the two methods, the program does not include learning disabled students (Shanahan & Barr, 1995). Success for All has been reported as successful with special education students (Ross et al., 1995), but only in comparison with regular special education services, as opposed to an alternative intervention.

The Matthew Effect and Need for Early Intervention

Perhaps the most significant point of agreement in the reviewed literature was the acknowledgment of the Matthew Effect and the resulting call for early intervention.
(Aaron, 1997; Spear-Swerling & Sternberg, 1994; Uhry & Shepherd, 1997). The Matthew Effect was coined by Stanovich (1986) based on the biblical scripture Matthew 25:29, that to those who have, more will be given, but to those who have not, even what they have will be taken away. In the realm of reading, the Matthew Effect refers to the rich-get-richer, poor-get-poorer phenomenon in which good readers become more and more motivated to read, get more practice reading, are expected to achieve more, and acquire additional cognitive skills through the process of frequent reading (Spear-Swerling & Sternberg). Poor readers, on the other hand, experience lowered motivation and expectations and have less practice reading, which leads to slow growth in acquiring new vocabulary and verbal information. What starts as a specific problem with reading escalates into a disability that affects cognition in general as well as other academic areas. Uhry and Shepherd hypothesized that early intervention for reading problems could diminish or prevent the cascade of negative effects associated with failure to read. Lyon (1996) pointed to another reason for early intervention when he maintained that remediation becomes more difficult and has a lower rate of success the longer children with a reading disability, at any level of severity, go without identification and intervention. In Uhry and Shepherd’s study, younger children (7 years) made treatment gains quicker than older children (11 years) in a comparison study.

Despite the need for early identification and intervention, most school districts do not identify learning disabled students until they are reading well below grade level; in most cases, identification takes place in grades 3 to 6 (Lyon, 1996; Vadasy et al.,
1997a). This does not have to be the case, however, as students with reading disabilities can be identified much earlier (Uhry & Shepherd, 1996). Current research has shown that deficits in phonological awareness (a strong indicator of reading disability), can be identified in late kindergarten and early first grade using inexpensive, straightforward testing protocols (Lyon). In a study conducted by Hurford et al. (1994), discriminant analysis was very accurate in identifying poor readers at the end of second grade based on data taken two years previously. Hurford et al. proposed that measures of intelligence, reading, and phonological processing taken at the beginning of first grade reliably identify reading disabled children. The literature therefore appears to support both the need for early identification of reading disabilities and the existing capability to do so.

**The Edmark Reading Program**

The published research on the *Edmark Reading Program* (1992) reports its use only with mentally retarded students. In 1977, Vandever and Stubbs studied 21 trainable mentally retarded (TMR) students who received two years of instruction in Level 1 of the *Edmark* program at two different schools. Their research was designed to investigate the acquisition, retention, and transfer of reading skills in TMR students, a group previously considered incapable of learning to read. The 21 participants in this study had a mean chronological age of 14 years 9 months and had previously failed to acquire significant reading skills. Students received 15 minutes of one-on-one instruction in the *Edmark Reading Program* daily; in one-half of the participating classrooms aides presented the program.
Students were tested on two word lists in October and May of both treatment years. One list presented the 150 Level 1 words that had been taught in order to test acquisition and retention, and the second consisted of 32 high frequency words not taught in *Edmark* in order to test transfer. A single-factor repeated measures analysis of variance was used to analyze data on the acquisition-retention words, and another for the transfer words. Significant effects were obtained for both groups of words.

While the researchers warned caution in interpretation of their data due to the small number of study participants and their not using a control group, they did conclude that TMR children can retain reading skills over the summer months and can demonstrate some transfer to untaught words. While Vandeveer and Stubbs (1977) speculated that instruction in phonics would have resulted in greater transfer than did the whole-word approach, they pointed out that the *Edmark* method allowed the TMR students to learn words more quickly than with phonics instruction, due to not needing mastery of many sounds before words could be decoded.

The term “errorless discrimination” was first discussed by Terrace (1963), who maintained that responses to S- (“errors”) are not a necessary condition for the formation of an operant discrimination of color. In his experimental research with pigeons, Terrace established that errors do not occur if discrimination training begins early in conditioning and if S+ and S- initially differ from each other. Such errorless discrimination training eliminates the need to extinguish responses to S-. Prior to Terrace’s work, it was believed that extinction of responding to S- was a necessary condition of the formation of a discrimination. The *Edmark Reading Program* (1992)
utilizes errorless discrimination in its method of teaching words through shaped sequences of visual and auditory-visual matching-to-sample, with the target word (S+) initially appearing alone, and eventually with orthographically similar words (Walsh & Lamberts, 1979). See Appendix A for examples of the program’s use of errorless discrimination.

The effectiveness of the Edmark Reading Program’s (1992) errorless discrimination technique was compared to that of a picture-fading technique in a study by Walsh and Lamberts (1979). The picture-fading approach paired the stimulus word with a picture representing the word, as the instructor verbally introduced the word (“Look at this word. This word is ______”). Over a series of six exposures, the picture was then progressively faded until only the stimulus word remained. In the Edmark errorless discrimination method, the target word appeared alone and the instructor asked the student to “Point to the word ____.” Over the next four to six exposures, the target word was presented with grossly dissimilar letter configurations and then with other words. Finally, the student was instructed to read the target word presented in isolation.

Thirty TMR students were trained on 20 words that all were unable to identify at pretest, for 10 minutes per day for 5 successive days in each treatment. Instruction was given individually by the regular classroom teachers and posttests were given on the day following completion of the intervention. Data were analyzed using analysis of covariance, separately for each of the three measures (word identification, word recognition, and picture-word matching), with pretest scores as covariates.
Performance differences favored the errorless discrimination treatment. Students recognized more words and were more successful on picture-word matching after the *Edmark* (1992) treatment. Treatment differences were greatest and most consistent on the word-identification posttest, in which words were printed in lowercase primary type on 8 x 13 cm cards and students were instructed to pronounce the words. The word recognition posttest consisted of the presentation of three words cards and the students being instructed to “Point to the word ______.”

The researchers concluded that the design of the *Edmark* (1992) program, based upon its exclusive word focus discrimination procedure, may be particularly suited to beginning readers. Walsh and Lamberts (1979) hypothesized that if the graphic informational value of words is low at first in beginning readers, then deliberate training to attend to discriminative orthographic configurations may speed up the transition to graphic consciousness. Walsh and Lamberts, like Vandever and Stubbs (1977), pointed out that their study lacked a control group.

In his review of research on reading instruction for children with moderate mental retardation, Conners (1992) examined all published research in the areas of sight-word instruction, word-analysis instruction, and oral reading error-correction with his target population. The author concluded that both sight-word instruction and word-analysis instruction are feasible and appropriate for use with children with moderate mental retardation. In the area of sight-word instruction, Conners stated that the literature suggests that picture integration, constant delay, and the *Edmark Reading Program* (1992) were the most effective methods.
One-On-One Tutoring

During the past twenty years, the availability of tutoring programs has expanded greatly as elementary and secondary schools have begun to utilize peers and paraprofessionals rather than certified teachers or professional tutors (Cohen, Kulik, & Kulik, 1982). In a meta-analysis of tutoring programs involving school-age children, Cohen et al. examined the efficacy of such interventions. From an initial review of 500 studies, the researchers found 65 interventions which met the following criteria: (a) took place in elementary or secondary school classrooms, (b) reported on quantitatively measured outcomes in both a tutored group and non-tutored control group, and (c) were free of serious methodological flaws.

Cohen et al. (1982) then determined effect sizes in three major areas: (a) student achievement as measured on examinations, (b) favorability of student attitudes toward subject matter, and (c) favorability of student self-concept. In 45 of the 52 studies measuring achievement, the examination performance of tutored students was better than that of non-tutored students, with an average effect size of .40. The authors found six features to be significantly related to effect size: tutoring effects were larger in (a) more structured programs, (b) in those of shorter duration, (c) in those teaching and testing lower level skills, (d) in those teaching math rather than reading, (e) in those using locally-developed rather than standardized tests, and (f) in those reported in journal articles or unpublished documents rather than in dissertations.

While the eight reviewed studies reporting student attitude toward subject matter revealed more positive attitudes in classrooms with tutoring programs, only one
study had an effect size large enough to be considered statistically reliable. In seven of the nine studies reporting effects on self-concept, self-concepts were more favorable in the tutored students, although the difference was not large enough to be considered statistically reliable.

In an attempt to assist at-risk first grade readers while determining factors contributing to successful outcomes of one-on-one tutoring, Juel (1996) paired 30 first graders with college students taking a developmental reading and study skills course. Each college student tutored one child for 45 minutes, twice a week, for two semesters. The participating children had the lowest scores in their school on the first grade Metropolitan Readiness Tests given in September. When the Iowa Tests of Basic Skills were administered as the posttest measure in April, tutored students far surpassed control group students, but the tutored group still was not performing as well as a normative group, having a mean score at the 41st percentile. While the tutoring had significantly improved the reading performance of the experimental group, its effect was not strong enough to bring the students up to the mean score for their peer group.

Juel (1996) speculated that the study results, which she interpreted as disappointing, indicated the need for an intervention lasting longer than one year for at-risk students who attend a school with a largely low-SES population. Rather than interpreting the results as showing her intervention was not effective enough to fully remediate reading disabilities, Juel chose to interpret her data as suggesting the need for a longer intervention period. In contrast, most reviewed studies, including the
proposed intervention, do not extend over an entire school year. In analyzing transcripts and videotapes of all tutoring sessions, Juel concluded that the most successful tutor-tutee dyads shared the following: (a) obvious affection, bonding, and verbal and nonverbal reinforcement of children’s progress; (b) many scaffolded reading and writing experiences; and (c) much explicit cognitive modeling of reading and writing processes by the tutor. The researcher also maintained that the key to improved student achievement is providing verbal interactions, instructions, and written materials that are on the right level and presented at the right time; this is not easy in whole-class situations, but can be attained in one-on-one tutoring sessions.

The use of parents as tutors was explored by Burns and Kondrick (1998) in their study of 10 parent-child tutoring dyads. Participating parents tutored their second- to fourth-grade reading disabled children for 70 sessions of 30 minutes each using stories from the Science Research Associates (SRA) Developmental Reading Laboratory Kits I and II. Children were pretested on the Stanford-Binet Intelligence Scale (SBIS), the Gray Oral Reading Tests-Revised (GORT-R), the Woodcock Reading Mastery Tests-Revised (WRMT-R), the Perceived Competence Scale for Children (PCSC), and a random word tests (RWT); all except the SBIS were readministered at posttest. A repeated-measures ANOVA was used to analyze data, which revealed significant and clinically meaningful improvements on standardized reading measures. The authors urged replication of their study using a control group.

The effects of a one-to-one reading program on the reading achievement of 15 low performing first-grade students utilized trained parents and teachers as tutors
Parent and teacher volunteers tutored students for 30- to 40-minute sessions twice a week from October to June using the Book Buddies Program. This program included repeated reading of three to four familiar books, word study and phonics, writing activities, and introduction to new reading materials. The 15 students in the control group received no special intervention; both control and experimental groups received instruction in an integrated language arts curriculum in their regular classrooms. Pre- and posttest data from a battery of reading assessments were analyzed with analysis of covariance. Results indicated a statistically significant difference between the two groups in phonemic awareness. No significant statistical differences were found between the groups in alphabet knowledge, concept of word, or word recognition.

To address criticism of one-on-one and small group pull-out programs for removing children from regular class instruction, Hedrick and Pearish (1999) studied examples of such programs at one Texas elementary school. By analyzing the reading growth of 31 first graders given one-on-one or small group supplementary reading instruction by a certified reading teacher, the authors concluded that the fast-paced daily lessons provided in the tutoring sessions resulted in more children attaining grade level reading skills. Hedrick and Pearish strongly stated that the nature of the instruction, rather than the location in which it is delivered, is what really matters.

In summary, the literature supports the efficacy of one-on-one tutoring programs delivered by peers, parents, paraprofessionals, uncertified personnel, and certified teachers (Wasik & Slavin, 1993; Vadasy et al., 1997b; Baker, 1998; Burns &
Kondrick, 1998). At the same time, studies have varied significantly in the statistical significance of their results. A need exists to develop one-on-one tutoring programs in reading which result in statistically significant differences between control and experimental groups on word recognition. The literature (Cohen et al., 1982; Wasik & Slavin, 1993; Juel, 1996; Shanahan & Barr, 1995) lists key elements for success in one-on-one tutoring programs as including (a) the use of structured programs, (b) individualized materials, and (c) frequent tutoring sessions given over long periods of time. The one-on-one tutoring program in this study was delivered by non-certified volunteers for 15 minutes each day for the first semester of the school year. The *Edmark Reading Program* (1992) is highly structured and allows students to progress through the program at their own pace.

**Summary and Implications**

The review of related literature on the effective teaching of word recognition to LD students revealed widespread disagreement over the definition, etiology, and predictive correlates of learning disabilities in reading. This lack of consensus was also reflected in the variety of treatment models proposed. Most interventions used either initial word learning strategies (such as sight word training and fluency training), phonetic analysis strategies (including combining phonological instruction with multisensory methods), cognitive strategies, or a combination of phonological and metacognitive strategies.

While most reviewed studies reported statistically significant improvements in one or more reading skills, many admitted the actual gains were minor, especially in
terms of the intensity, duration, and cost of treatment. In addition, some percentage of students either did not improve significantly or were still well below average in their reading achievement. Despite the prevalence of one-on-one delivery models, which incur significant costs, the levels of success were disappointing. Even the most well-known and frequently replicated intervention, Reading Recovery, was not successful with 10-30% of participating children, and the program did not even attempt intervention with students identified as learning disabled. Clearly, no single theoretical framework or intervention emerged as most effective in remediating reading disabilities.

An attempt to evaluate and compare the efficacy of the reviewed programs was seriously hindered by weakness in the research. Many of the studies had methodological problems: small sample populations, no control group, and/or a lack of random assignment when a control group was used. Many were narrow in scope, addressing only one grade level, thus calling into question whether results could be generalized to other groups. Because of differing definitions of LD, it was not clear if the same type of students comprised experimental and control groups. Most reviewed interventions were of short duration, and few had been replicated by different, independent researchers. The majority of studies could not control for reading interventions their experimental sample received outside of the program studied (e.g., in their regular education or special education classrooms, in Title I rooms, or in private tutoring situations). The same held true for the control group, when it existed; most often, no accounting was made for the type of intervention used in general education or resource rooms.
Perhaps most significantly, all studies reviewed used different measures of effectiveness, making a comparison of efficacy almost impossible. In addition, this wide variation in tests used raised the possibility of researchers choosing pre- and post-tests biased towards the type of skills taught in their intervention. Bias was a major concern when program authors (such as Das, Lockavitch, and Slavin) also researched the effectiveness of their own interventions. In all, the literature seemed to supply fragmented, disconnected pieces of the puzzle; rarely were two pieces alike, and only sometimes did they seem to fit together to reveal a larger segment of the picture.

The majority of reviewed articles did appear to agree on three issues. First, reading disabled children require explicit, direct instruction that is intensive, focused, and not of brief duration. Second, early identification and intervention could possibly prevent reading disabilities, or at least reduce their magnitude. Finally, more research is needed in this area. The failure of any one method to successfully remediate all reading disabilities suggests that different approaches may well be required for different learners. Because some students cannot decode phonetically after years of remediation (Lovett et al., 1990; Uhry & Shepherd, 1997), such disabled readers may be best served by initial instruction based on their strengths, using their compensation strategies, such as sight word memorization.

The use of a rebus-based program to teach 150 initial sight words resulted in initial success experiences for targeted students (Biemiller & Siegel, 1997). A more direct approach to sight word acquisition (such as the Edmark Reading Program, 1992) could possibly be used to develop an initial 150-word sight vocabulary. This
would provide beginning success experiences and reading practice while phonological and metacognitive strategies were being taught over the long period of time the literature suggests is needed to remediate reading disabilities. In addition, reading with a sight word vocabulary would actually improve phonological awareness (Spear-Swerling & Sternberg, 1994). Such a strategy would be consonant with the basic special education principle of building on strengths while remediating weaknesses, and, if employed early in first grade, could prevent the poor self-esteem and low motivation that result from reading failure (Lyon, 1996).

The reviewed literature provided support for questioning the classification of students as learning and/or reading disabled, and instead urged the focusing of time and energy on giving all children who exhibit weaknesses in reading the instruction they need to become successful readers. The current study targeted first grade students identified by their teachers and principals as being at-risk for reading failure, regardless of their disability label or lack of diagnosis.

The intervention tutored students at the beginning of the first semester of their first grade year, thus addressing the Matthew Effect and widespread call in the literature for early intervention. It also met the conditions agreed upon in much of the reviewed literature for instruction with reading disabled children in supplying explicit, direct instruction that is intensive, focused, and not of brief duration. The supplementary reading program used was extremely structured and sequential, and was administered in 15-minute sessions, five days a week, for the entire first semester of the school year.
The literature also supports the use of sight word training as a supplementary method of instruction, while phonemic awareness and phonetic decoding skills develop over the long term. While highly replicated programs such as Reading Recovery and Success for All, which combine phonological and metacognitive strategies, are the most successful reported in the literature, their cost precludes their use in school systems such as the one participating in the proposed intervention. The economic feasibility of implementing the Edmark Reading Program using volunteers or paraprofessionals makes its replication in the participating school system a possibility.

While the literature supports the use of one-on-one tutoring, especially using paraprofessionals and volunteers as cost-effective measures, it also points out the disappointing results of programs which asked such non-certified personnel to teach phonetic decoding and metacognitive skills that require the knowledge and expertise of certified teachers. It was hypothesized that the structured nature of the Edmark Reading Program (1992) would allow non-certified volunteers to implement it in a satisfactory manner. In addition, based upon personal experience over a 13-year period of using Edmark with learning disabled students, the researcher further hypothesized that it could be successful with at-risk first grade readers. While Biemiller and Siegel (1997) conducted a similar study, their intervention taught 150 initial sight words using a rebus-based program and picture-fading technique. Because the literature cites the effectiveness of Edmark's errorless discrimination method with moderately mentally retarded children, and its superiority to picture fading techniques with that population, the researcher hypothesized that it would also be an effective supplementary method to
use with at-risk beginning readers. Such low achieving first graders shared the MR students' inability to phonetically decode words, as well as their extremely limited sight word vocabulary. No existing published studies had combined the elements of one-on-one tutoring, administration by volunteers or other non-certified personnel, a highly structured program designed to teach only sight words, and at-risk first grade readers, regardless of disability classification, who were in the regular classroom. The current study examined the efficacy of using the Edmark Reading Program (1992) to teach a supplemental sight word vocabulary to at-risk first grade students using non-certified volunteer tutors.
CHAPTER III

METHODOLOGY AND PROCEDURES

The current study was designed to determine if one-on-one tutoring in the *Edmark Reading Program* (1992) could have an effect on the reading achievement of at-risk first grade students. The study gathered both quantitative and qualitative data, which were analyzed using descriptive and inferential statistics as well as content analysis of qualitative information as themes emerged during the intervention (Patton, 1990). The purpose of this chapter is to describe the methodology and procedures followed in implementing the study in the following areas: (a) research design, (b) sample, (c) instrumentation, (d) procedural details, (e) internal validity, and (f) data analysis.

**Research Design**

The current study combined elements of an experimental design with aspects of a qualitative study. The majority of research on interventions with early elementary level children at-risk for reading failure select for study participants the 20% of the population most at-risk for reading failure, as defined in the individual studies (e. g., Clay, 1979; Ross et al., 1995; Slavin et al., 1996). The three public elementary schools participating in the proposed study were chosen for their having the lowest SES
students of the four public elementary schools in the rural, northern Louisiana town, based upon the percentage of their students receiving free or reduced lunches. These schools average 80 to 100 kindergarten students in each school each year, of which approximately 80 to 90 in each school progressed to first grade at the beginning of the 1999-2000 school year. Sixty-two students, or the lowest 20 to 30% of the first grade population in terms of reading achievement were identified; two students were lost to attrition, leaving 60 study participants. This selection was based on informal teacher assessment, student scores on the nine unit tests in the *HBJ Treasury of Literature* (Farr, 1993) kindergarten basal reading series, or the first grade basal reading series for repeaters, and scores of “below grade level” on the Developmental Reading Assessment (Beaver, 1997) administered at the beginning of first grade. Participants were randomly assigned to either a treatment or control group in each of the three schools. Both groups were pretested at the beginning of the 1999-2000 school year on three subtests of the *Woodcock Reading Mastery Tests-Revised* (Woodcock, 1987).

The experimental treatment group received 15 minutes per day of one-on-one tutoring in the *Edmark Reading Program* (1992), Monday through Friday, for the first semester of the school year by America Reads volunteers. The control group at each school was read aloud to for 15 minutes per day in small groups, Monday through Friday, for the first semester of the school year, by the same America Reads volunteers. Books appropriate for reading aloud to first graders were chosen by the volunteer tutors with the guidance of the participating schools’ librarians. All treatment was given by adult volunteer tutors who were not certified teachers. Because of the small number
of participants and the purposive sampling of the participants to target those most at-risk for reading disability, the study also contained the qualitative components of field notes, examination of records, and interviews with key informants (parents, teachers, and administrators) as well as the participants themselves.

Because the study was designed to determine the effects of a supplementary one-on-one tutoring program, it was determined that non-certified personnel would most likely administer such an intervention if it were to be replicated in the public schools in the future. The researcher was aware that several undergraduate education majors at her university were serving as America Reads volunteers in the local community. As part of his America Reads Challenge, President Bill Clinton had proposed that 100,000 Federal Work Study students serve as tutors to help children read well by the end of third grade. Through this federal funding, America Reads volunteers were available to tutor reading students in the local public schools. By contacting her university's America Reads program sponsor, the researcher was able to utilize six America Reads volunteers as tutors in the study. These women had received several hours of training in general principals of reading tutoring by the America Reads program before being trained by the researcher. Four of them were undergraduate education majors, one was in a Fifth Year education program, and one had graduated from an education program but had never completed requirements for teacher certification.
Sample

The sample for the study was purposefully selected in order to determine the 20 to 30% of the target population (first graders) most at-risk for reading disabilities. The population from which the sample was drawn were entering or repeating first grade students in three public elementary schools in a rural north Louisiana school district. These schools contained the greatest percentage of students receiving free lunches (85%, 74%, and 59%) ("Our Schools," 1999). All three schools were further identified as Title I schools, in which all students received computer-assisted instruction in reading and math in Title I computer laboratories.

The following procedure was used in the sample selection:

1. In August of the 1999-2000 school year the researcher asked the principals at the three participating elementary schools during face-to-face conferences, to select the 20 to 30% of first grade students considered to be the most at-risk for reading failure.

2. The principals were asked to base their selection on the following:

   a. The average test scores for each student on the nine unit tests given during the kindergarten year, or during the first grade for repeaters, from the *HBJ Treasury of Literature* (Farr, 1993) basal reading series used in the parish. Eight unit tests are from the book *Treasure Tree* and one is from *At My Window*.
b. Informal kindergarten and/or first grade teacher assessment, which includes students' participation in group activities and teacher observation of reading skills.

c. The results of first grade teachers' administration of the state-mandated Development Reading Assessment (Beaver, 1997) to each child.

3. Parents of the selected students were sent letters in August/September of 1999 describing the proposed study and seeking permission to include their children. Human Subjects Consent Forms were included for their signatures and those of the participating children.

Instrumentation

The quantitative data in the proposed study were obtained from the following sources:

1. Pre-test scores on the following subtests of the *Woodcock Reading Mastery Tests-Revised* (WRMT-R), Form G (Woodcock, 1987): (a) Letter Identification, (b) Word Identification, and (c) Word Attack. The pre-tests were administered in August/September 1999.

2. Posttest scores on the following subtests of the *Woodcock Reading Mastery Tests-Revised*, Form H (Woodcock, 1987): (a) Letter Identification, (b) Word Identification, (c) Word Attack, and (d) Passage Comprehension. The posttests were administered at the end of the intervention, which coincided with the end of the third six-weeks of school, January 2000.
3. The number of words read on the posttest of the *Edmark Reading Program* (1992), which consisted of reading a list of 150 individually presented words taught in Level 1 of the program.

The pre-intervention testing was completed by the researcher after training by the parish Pupil Appraisal personnel. Post-intervention testing was done by an external evaluator qualified to administer the tests. The *Woodcock Reading Mastery Tests-Revised* (Woodcock, 1987) are a battery of individually administered reading tests surveying several components of the act of reading, which are appropriate for student levels ranging from kindergarten through college senior (Cooter, 1989). The complete battery contains six tests: (a) Visual-Auditory Learning, (b) Letter Identification, (c) Word Identification, (d) Word Attack, (e) Word Comprehension, and (f) Passage Comprehension, as well as a two-part supplementary letter checklist. Two forms of the *WRMT-R* (Woodcock), Forms G and H, are available, and are recommended for pre- and posttest use (Jaeger, 1989).

Items on the *WRMT-R* (Woodcock, 1987) are scored correct or incorrect during test administration in order to determine the ceiling level, at which testing is discontinued. The three subtests to be used are scored by placing a 1 (one) or a 0 (zero) next to the items on the response pages of the test record, with 1 indicating a correct response, and 0 an incorrect response or failure to respond. If a student changes a response during test administration, the item is scored according to the last response given. Incorrect responses can be recorded in the “Error Response” column for use in error analysis. *WRMT-R* data in the proposed study will be reported in raw scores and
standard scores. The raw scores are the sum of the correct answers given plus a score of 1 for every item in the test below the basal. The raw scores can then be plotted on the profiles or transferred to the Summary of Scores page for use in obtaining derived scores. Four types of standard scores can be calculated; the standard score to be used is based on a mean of 100 and a standard deviation of 15. Standard errors of measurement are used in the Summary of Scores to determine plus-and-minus one SEM confidence bands for the standard scores.

The supplementary Letter Identification subtest presents letters only in the sans serif style commonly used in basal reading series, and requires the identification of each alphabet character’s name. The Word Identification test requires students to identify words in isolation; 106 words are arranged in order of difficulty. The Word Attack test consists of 45 nonsense words which students are asked to pronounce. Tests authors believe this task closely simulates the encounter of an unknown word.

The WRMT-R (1987) yields (a) raw scores, (b) grade equivalent scores, (c) instructional ranges, (d) normative information, (e) standard scores, and (f) standard error of measurement confidence bands for percentile ranks and standard scores. The battery was normed on a sample of 6,089 people; 4,201 subjects were in grades K-12. The sample consisted of 60 geographically diverse communities selected to match socioeconomic characteristics of the 1980 U. S. Census. The norming sample was randomly selected using a stratified sampling design.

Reliabilities for the WRMT-R were calculated using the split-half procedure and corrected for length using the Spearman-Brown formula. Split-half reliability
coefficients for each of the tests range from a low of .34 (grade 5 of the Letter Identification test) to a high of .98 (grade 1 of the Word Identification test). The median split-half reliability coefficients for forms G and H range from .84 to .98 (Cooter, 1989).

Concurrent validity of the WRMT-R (Woodcock, 1989) was obtained using correlational statistics comparing the WRMT-R with the Woodcock-Johnson Reading Tests, a possible weakness because both tests share the same author (Cooter, 1989). The WRMT-R’s explanation of content validity has also been criticized: its items were reportedly developed with the assistance of outside experts and experienced teachers, but these sources are not further identified (Cooter).

Despite criticisms of the WRMT-R’s validity (Cooter, 1989; Jaeger, 1989), its Word Identification and Word Attack subtests, along with the Gray Oral Reading Test-3rd Edition (Bryant & Wiederholt, 1991) are the most commonly used diagnostic measures of word reading ability (Torgesen, 1998). The Gray Oral Reading Test, however, is not recommended for use with students at very low levels of reading performance, and has therefore not been selected for use in the proposed study (Torgesen).

Qualitative data were collected in the form of field notes kept during the treatment period (August/September 1999 through January 2000), review of documents such as report cards, and interviews with key informants. Field notes focused on weekly observations by the researcher of the one-on-one tutoring and group reading sessions in each school. Interviews were conducted with the following key
informants: (a) parents of participating students, (b) regular education teachers of participating students, (c) participating students, and (d) the principals and assistant principals of the participating schools. The interviews were conducted: (a) before the intervention began (kindergarten teachers, students, principals and assistant principals), and (b) at the conclusion of the intervention in January and February 2000 (parents, first grade teachers, students, principals and assistant principals). Questions asked in the semi-structured interviews are located in Appendix B.

**Procedural Details**

During the first semester of the 1999-2000 school year, adult volunteers who were not certified teachers worked individually with each of the 31 experimental group students for 15 minutes per day, Monday through Friday. The treatment began as soon as all participating students were identified, parental permission was received, and students were administered the pre-test measures by the researcher. Volunteer tutors were trained in small groups or one-on-one by the researcher for two hours on administration of the *Edmark Reading Program* (1992) using the manual that accompanies the program. The researcher demonstrated program administration to the volunteer tutors, and then observed them teach lessons to the researcher and each other. After the initial training on all program components and method of delivery of instruction, the researcher accompanied each volunteer during her first day of tutoring. At that time, the researcher modeled program delivery for each volunteer with several of her experimental group students. The researcher then observed the volunteer implementing the program and provided feedback on fidelity to program instructions.
for delivery. After spending the first day with each volunteer, the researcher observed each volunteer once per week for the duration of the intervention. The same volunteer tutors read aloud for 15 minutes each day to the control group students. Volunteers had been trained by the America Reads Program on basic principals of tutoring reading, such as using inflection and reading clearly and slowly when reading aloud to participating children.

The volunteer tutors delivered the *Edmark* (1992) instruction either in the back of the participants' first grade classrooms or in near-by empty rooms. The control group students were read aloud to in a group at each school in an available designated room by the same tutors. In both cases, students were taken out of their regular class instruction for 15 minutes each day for the duration of the intervention.

The experimental group treatment consisted of 15 minutes of one-on-one instruction in the *Edmark Reading Program* (1992), beginning with Level I, and continuing as far as student progress permitted, through Level 2. The *Edmark Reading Program* is a sequenced, highly repetitive sight word approach. The program manual describes the small steps in word acquisition that provide intrinsic motivation through high levels of success (an approximate correct response rate of 90% or better). See Appendix A for a more complete description of the *Edmark* program.

Level 1 of the program uses five types of lessons: (a) pre-reading, (b) word recognition, (c) direction cards, (d) picture/phrase cards, and (e) story book. Level 1 of the program teaches a 150 basic sight word vocabulary, including endings -s, -ed, and -ing. See Appendix A for a more complete description of the 150 words. According to
program developers, Level 1 of Edmark (1992) takes a non-reader to approximately 1.0 (beginning first grade) reading level. Level 2 teaches an additional 200 sight words, including compound words, resulting in a reading level, according to the program, of 2.0 to 3.0 (beginning second to beginning third grade).

Student prerequisites for participation in the program are minimal: (a) the ability to point to select a correct choice from a multiple-choice array, (b) the ability to repeat words, and (c) sufficient receptive language to follow teacher directions. The program begins with Pre-Reading lessons that teach visual discrimination, followed by a Discrimination Test that requires the student to match-to-sample letters, groups of letters, numbers, and words. The teacher may begin with the Discrimination Test; a student making no more than four errors may skip the Pre-Reading lessons. Any student who demonstrates a lack of prerequisite program skills by not passing the Discrimination Test will complete the Pre-Reading lessons in the program which teach the needed discrimination skills. The student will then retake the Discrimination Test.

Students then begin the Word Recognition lessons, 60 of which each introduce one new word or the endings -s, -ed, or -ing, followed by 48 lessons teaching two words each. The lessons consist of many "frames," or one line of words visible through a vinyl display mask. The word to be taught is first introduced in isolation (e. g., "horse"), and the student is directed to point to "horse." The following frames present "horse" and two other letter groups or words; the students is instructed to find "horse." Finally, the word is presented in isolation and the student is directed to read the word. Students are praised for correct responses; if students say the incorrect word they are
simply told the word, asked to read it again, and then praised for their response.

Subsequent lessons present the words in meaningful sentences.

After five words are introduced, comprehension activities are added to the program's lesson sequence. Direction Card lessons teach the meaning of the words and how to follow increasingly complex instructions. Each card contains six phrases or sentences (e.g., "a yellow car and a boy"). Students find the appropriate objects from a set of color illustration cards and place them under the stimulus phrases or sentences. Story Book lessons present stories of increasing length and complexity, using only the words previously taught. In Level 2, the teacher asks the student oral comprehension questions for each story. Picture/Phrase Card lessons provide further comprehension exercises, as students choose words, phrases, or sentences to describe illustrations of objects, situations, or events (e.g., "The boy runs fast" is placed under a picture of a running boy).

Each word taught is repeated throughout the program to attain permanent acquisition. After every 10 new words, the student takes a posttest consisting of reading the words in isolation. When a word is missed, the student is to repeat the lesson where the word was introduced before re-testing. The Edmark Reading Program (1992) was taught according to the lesson sequence presented in the program's Student Record Book. One record book was maintained for each student in the experimental group.
Internal Validity

The threats to internal validity of history and maturation were addressed in the study by having both control and experimental groups of student participants. The threat of pretesting was addressed by administering two different forms of the standardized instrument: Forms G and H of the WRMT-R (Woodcock, 1987); the Letter Identification subtest, however, appears only in Form G, which was readministered. Form G was administered August/September 1999, and Form H was given as the posttest in January/February 2000. Identical protocols for scoring the test were used in order to avoid changes in the measuring instrument or its scoring. The problem of researcher expectancy was addressed by having all posttests administered by an external educator who was unaware of experimental and control group assignments. In order to reduce the Hawthorne Effect, control group students were read aloud to in small groups by the same volunteer tutors implementing the Edmark (1992) treatment.

Limitations

Limitations of the study included the problem of statistical regression, which is common when subjects are selected for extremely low test scores. Students in the study were selected for scoring in the bottom 20-30% of students in their grade level in reading. The small sample size was another significant limitation. The study initially included 31 experimental and 31 control group students; two control group students were lost to attrition. Selection of the sample was purposeful, rather than random, and because this selection was done by principals and teachers, their adherence to selection
criteria could not be documented. An additional limitation was the first grade teachers’ awareness of students’ status as experimental or control group participants, as experimental group students left their classrooms one at a time for tutoring, while control group students left in small groups. Because the students were also aware that two different groups existed, the John Henry Effect could have been an additional confounding variable.

While the Hawthorne Effect was partially controlled for by reading to control group students, the number of America Reads volunteers available precluded control group students being read to one-on-one. If ample volunteers had been available, the control group could have been taught the 150 Edmark words using another instructional method. Another limitation was the lack of validity and reliability data on the Developmental Reading Assessment (DRA), which was given to all students by the participating schools. This assessment can only be seen as having “field validity,” as the participating school system determines if elementary students are below, on, or above reading level by administering this assessment at the beginning of the school year.

Finally, the bias of the researcher after using the Edmark Reading Program for 13 years should be noted. To partially control for such bias, an external examiner, unaware of students’ experimental or control group status, administered all posttests. In addition, the qualitative data concerning student attitudes toward reading, school, and self which were gathered in the study were based upon subjective reports by key informants; no attitudinal instruments were used.
Data Analysis

The quantitative data in the proposed study were analyzed using descriptive and inferential statistics. Posttest scores from the Letter Identification, Word Recognition, Word Attack, and Passage Comprehension subtests of the WRMT-R (Woodcock, 1987) and the Edmark posttest were analyzed using analysis of covariance (ANCOVA). Because it was not known if the experimental and treatment groups would differ significantly on the dependent variable (word recognition) before treatment, the pretest scores were considered for use as covariates. This allowed for the statistical control for any differences the experimental and control groups exhibited on the dependent variable (Crowl, 1996). In addition, a second covariate, Repeater Status, was considered to control for the variation in age between repeaters and non-repeaters. Step-wise multiple regressions were used to determine the most appropriate covariates for each dependent variable. The alpha level for significance was set at p<.05. The three pretest measures were administered to determine if initial differences existed between control and experimental groups, based on Crowl’s admonishment that “the pretest is used solely for establishing comparable groups by means of matched pairs,” and that “the use of ‘change scores’ (i.e., the scores that result from subtracting the pretest scores from the posttest scores) should be avoided” (p. 300). The ANCOVAs were used to test the null hypothesis that the control and experimental groups represented random samples from populations with the same means (Harris, 1998).
To measure how much the treatment (one-on-one tutoring in the Edmark Reading Program) affected the dependent variable (word recognition), Cohen’s $d$, or effect size, was also calculated (Kenny, 1987). Effect size can provide research results that are trustworthy, usable, and accessible to practitioners and is gaining acceptance as a supplement to the interpretation of tests of statistical significance (Thompson, 1999).

Qualitative data were analyzed during data collection in the form of field notes and interviews (Bogdan & Biklen, 1992). Such data were coded into recurring categories or themes. Content analysis was used to identify, code, and categorize primary patterns in the data collected (Patton, 1990). Data were cross-validated for accuracy by analyzing observations during the treatment sessions, interviews with key informants, and review of documents, such as teacher reports, comments, and grades on student report cards.
CHAPTER IV

DATA ANALYSIS

The purpose of this study was to investigate the effects of using an economically feasible sight word training program as a supplementary reading intervention with first grade students at-risk for reading failure. Sixty-two students in three participating elementary schools were purposefully selected by their principals and teachers as being at-risk for reading failure. These students were administered three subtests of the Woodcock Reading Mastery Test—Revised (WRMT-R) (Letter Identification, Word Identification, and Word Attack) at the beginning of the 1999-2000 school year. The students, their kindergarten teachers from the previous school year, as well as their principals and assistant principals were interviewed by the researcher. Students were then randomly assigned to either a control or an experimental group at each school. Experimental group students received 15 minutes per day of one-on-one tutoring in the Edmark Reading Program for the first semester of the 1999-2000 school year. Tutoring was administered by America Reads volunteers who were not certified teachers. Control group students were read to aloud in groups for 15 minutes per day for the first semester by the same volunteer tutors in order to partially control for the Hawthorne Effect. Two control group students were lost to
attrition during the study, resulting in 60 participants at posttest. Participant gender, repeater status, and school are shown in Table 1.

**Table 1: Participants by Gender, Repeater Status, and School**

<table>
<thead>
<tr>
<th>School A</th>
<th>N</th>
<th>Male</th>
<th>Female</th>
<th>Repeaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>14</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Experimental</td>
<td>16</td>
<td>10</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School B</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Experimental</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School C</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Experimental</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Study</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>29</td>
<td>31</td>
</tr>
<tr>
<td>Experimental</td>
<td>21</td>
<td>10</td>
</tr>
</tbody>
</table>

At the conclusion of the first semester, all participating students were posttested by an external examiner on the following measures: four subtests of the WRMT-R (Letter Identification, Word Identification, Word Attack, and Passage Comprehension) and the *Edmark Reading Program* list of 150 words taught in Level I, which students were asked to read orally. At the end of the intervention, the researcher conducted
interviews with the participating students, their first grade teachers, principals, and assistant principals, as well as their parents or guardians, and first semester report cards were examined as supporting documentation. The purpose of this chapter is to discuss the analysis of the quantitative and qualitative data collected in this study.

Analysis of Quantitative Data

Hypothesis 1

As stated in Chapter I, null hypothesis 1 read as follows: There is no statistically significant difference in the level of word recognition, as measured by the Word Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group. In order to test this hypothesis, a stepwise multiple regression analysis was first used to determine the significance of the relationship between variables other than the independent variable (Edmark treatment) and the dependent variable, the WRMT-R Word Identification Posttest. Variables considered were participant gender, status as repeater/nonrepeater, grade repeated (kindergarten, first, or none), and WRMT-R Word Identification Pretest scores. The level of significance was chosen as p<.05. Two models were generated by the regression analysis. Table 2 indicates that two factors, WRMT-R Word Identification Pretest and Grade Repeated could be used to predict the WRMT-R Word Identification Posttest scores.
Table 2: Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>WRMT-R Word ID SS Pretest</td>
<td>Stepwise (Criteria Probability-of-F-to enter &lt;= .050, Probability-of-F-to remove &gt;= .100).</td>
</tr>
<tr>
<td>2</td>
<td>Grade Repeated</td>
<td>Stepwise (Criteria Probability-of-F-to enter &lt;= .050, Probability-of-F-to remove &gt;= .100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: WRMT-R Word Identification Standard Score Posttest

As shown in Table 3, the adjusted $R^2$ indicated that the WRMT-R Word Identification Pretest standard scores could explain 57% of the variability in WRMT-R Word Identification Posttest scores ($R^2 = .57$). When Grade Repeated was added to the model, the WRMT-R Word Identification Pretest standard scores combined with Grade Repeated could explain 65% of the variability in WRMT-R Word Identification Posttest scores ($R^2 = .65$). The significance level for these correlations was $p < .001$. See Appendix C for actual correlations of all dependent and independent variables.

Table 3: Model Summary of WRMT-R Word Identification SS Pretest, Grade Repeated, and Time of Day

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R$ Square</th>
<th>Adjusted $R$ Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.760a</td>
<td>.578</td>
<td>.570</td>
<td>9.12</td>
</tr>
<tr>
<td>2</td>
<td>.814b</td>
<td>.663</td>
<td>.651</td>
<td>8.23</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), WRMT-R Word ID SS Pretest
b. Predictors: (Constant), WRMT-R Word ID SS Pretest, Grade Repeated
To test the hypothesis that the amount of variance explained by the regression model (Table 3) was more than the variation explained by the average, the F ratio was used. In order to test the significance of the overall model, a coefficient of determination was computed by applying an ANOVA. As shown in Table 4, with $F=79.32$ for Model 1, the significance of the WRMT-R Word Identification SS Pretest as a predictor of the WRMT-R Word Identification SS Posttest was $p<.001$. For Model 2, also shown in Table 4, with $F=55.98$ the significance of the WRMT-R Word Identification SS Pretest and Grade Repeated as predictors of the WRMT-R Word Identification SS Posttest was $p<.001$.

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>6602.92</td>
<td>1</td>
<td>6602.92</td>
<td>79.32</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>4828.02</td>
<td>58</td>
<td>83.24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1430.93</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>7574.38</td>
<td>2</td>
<td>3787.19</td>
<td>55.98</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>3856.55</td>
<td>57</td>
<td>67.66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>430.93</td>
<td>59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), WRMT-R Word ID Standard Score Pretest

<sup>b</sup> Predictors: (Constant), WRMT-R Word ID Standard Score Pretest, Grade Repeated

<sup>c</sup> Dependent Variable: WRMT-R Word ID Standard Score Posttest

Based upon this analysis, WRMT-R Word Identification Pretest Standard Scores and Grade Repeated were used as covariates in the univariate analysis of covariance (ANCOVA) in order to increase statistical power and reduce bias. Of study
participants, 7 of the 20 control group students were classified as repeaters, with 4 having repeated kindergarten and 3 currently repeating first grade. In the experimental group, 10 of the 31 participants were classified as repeaters, with 4 having repeated kindergarten and 6 currently repeating first grade. Results of the analysis of covariance are presented in Table 5, and adjusted post-mean determinations are shown in Table 6. The $F$ value of .60 was not statistically significant at the .05 level. While the experimental group scored higher than the control group on the WRMT-R Word Identification Posttest, there was not a statistically significant difference between the two groups.

<table>
<thead>
<tr>
<th>Table 5: One-Way ANCOVA of WRMT-R Word Identification Posttest Standard Scores by Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
</tr>
<tr>
<td>Corrected Model</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>Grade Repeated</td>
</tr>
<tr>
<td>Word ID Pretest</td>
</tr>
<tr>
<td>GROUP</td>
</tr>
<tr>
<td>Error</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Corrected Total</td>
</tr>
</tbody>
</table>
Table 6: Adjusted Posttest Means of WRMT-R Word ID Standard Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Adjusted Mean</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>83.38</td>
<td>92.14</td>
<td>92.665a</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>14.05</td>
<td>14.81</td>
<td></td>
<td>.602</td>
</tr>
<tr>
<td>Experimental**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>86.19</td>
<td>94.84</td>
<td>94.346a</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>12.54</td>
<td>13.14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a. Evaluated as covariates, appeared in the model: Grade Repeated = 2.57, WRMT-R Word ID SS Pretest = 84.83.

*n = 29

**n = 31

In order to determine how much the treatment affected the WRMT-R Word Identification Posttest standard scores, effect size, or Cohen's $d$, was calculated. Cohen's $d$ is the difference between control and experimental treatment posttest mean scores divided by the pooled standard deviation (Swanson, 1999). This calculation yielded an effect size of .19, which is considered small (Kenny, 1987). This small effect size supported the finding of no significant differences between experimental and control groups on the WRMT-R Word Identification subtest.

Hypothesis 2

As stated in Chapter I, null hypothesis 2 read as follows: There is no statistically significant difference in the level of word recognition, as measured by the Level 1 Posttest of the Edmark Reading Program, between the experimental group and the control group. In order to test this hypothesis, a stepwise multiple regression analysis was first used to determine the significance of the relationship between variables other
than the independent variable (Edmark treatment) and the dependent variable, the Edmark Level 1 Posttest. Variables considered were participant gender, status as repeater/nonrepeater, grade repeated (kindergarten, first, or none), and DRA Pretest scores. Because no pretest scores were available for the Edmark word list, the DRA Pretest scores obtained for each child by his or her classroom teacher at the beginning of the school year, before implementation of the intervention, were considered as a possible covariate. A bivariate correlation was performed on the DRA Pretest data and Edmark Posttest scores; Table 7 shows results of the Pearson Correlation.

**Table 7: Pearson Correlation of DRA Pretest and Edmark Posttest**

<table>
<thead>
<tr>
<th></th>
<th>DRA Pretest</th>
<th>Edmark Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRA Pretest</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1.00</td>
<td>.274*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td><strong>Edmark Posttest</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.274*</td>
<td>1.00</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.034</td>
<td>.034</td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

The Pearson analysis revealed a correlation significant at the 0.05 level (2-tailed), thus justifying the inclusion of the DRA Pretest data in the stepwise multiple regression. The level of significance for the regression was set at p<.05. One model was generated by the regression analysis. Table 8 indicates that one factor, DRA Pretest, could be used to predict the Edmark Posttest scores.
Table 8: Variables Entered/Removed\(^a\)

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DRA Pretest</td>
<td>Stepwise (Criteria Probability-of-F-to enter &lt;= .050, Probability-of-F-to remove &gt;= .100).</td>
</tr>
</tbody>
</table>

\(^a\) Dependent Variable: Edmark Level 1 Posttest

As shown in Table 9, the adjusted $R^2$ indicated that the DRA Pretest could explain 6% of the variability in Edmark Posttest scores ($R^2=.059$). The significance level for this correlation was $p<.001$. See Appendix C for actual correlations of all dependent and independent variables.

Table 9: Model Summary of Edmark Posttest and DRA Pretest

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.274(^a)</td>
<td>.075</td>
<td>.059</td>
<td>38.46</td>
</tr>
</tbody>
</table>

\(^a\) Predictors: (Constant), DRA Pretest

To test the hypothesis that the amount of variance explained by the regression model (Table 9) was more than the variation explained by the average, the $F$ ratio was used. In order to test the significance of the overall model, a coefficient of determination was computed by applying an ANOVA. For Model 1, shown in Table 10, with $F=4.71$ the significance of DRA Pretest as a predictor of the Edmark Posttest was $p<.05$. 

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Table 10: ANOVA of DRA Pretest\textsuperscript{a}, and Edmark Posttest\textsuperscript{b}

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>6968.03</td>
<td>1</td>
<td>6968.03</td>
<td>4.71</td>
<td>.034\textsuperscript{a}</td>
</tr>
<tr>
<td>Residual</td>
<td>5801.70</td>
<td>58</td>
<td>1479.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2769.73</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), DRA Pretest
b. Dependent Variable: Edmark Posttest

Based upon this analysis, DRA Pretest was used a covariate in the univariate analysis of covariance (ANCOVA) in order to increase statistical power and reduce bias. Results of the analysis of covariance are presented in Table 11, and adjusted post-mean determinations, using the DRA scores as pretest scores, are shown in Table 12. The F value of 44.10 was statistically significant at the .05 level. The experimental group scored higher than the control group on the Edmark Posttest, and this difference was statistically significant.

In order to determine how much the treatment affected the Edmark Posttest scores, effect size, or Cohen's $d$, was calculated. Cohen's $d$ is the difference between control and experimental treatment posttest mean scores divided by the pooled standard deviation (Swanson, 1999). This calculation yielded an effect size of 1.2. According to Kenny (1987), .8 is considered a large $d$, and values larger than two are quite rare, with most effect sizes ranging from zero to one. The treatment effect size of 1.2, therefore, was large, and helped explain the treatment effect in the program.
### Table 11: One-Way ANCOVA of Edmark Posttest Scores by Group

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>44394.67</td>
<td>2</td>
<td>22197.34</td>
<td>26.16</td>
<td>.000</td>
<td>.479</td>
</tr>
<tr>
<td>Intercept</td>
<td>27277.45</td>
<td>1</td>
<td>27277.45</td>
<td>32.14</td>
<td>.000</td>
<td>.361</td>
</tr>
<tr>
<td>DRA Pretest</td>
<td>10364.11</td>
<td>1</td>
<td>10364.11</td>
<td>12.21</td>
<td>.001</td>
<td>.176</td>
</tr>
<tr>
<td>GROUP</td>
<td>37426.64</td>
<td>1</td>
<td>37426.64</td>
<td>44.10</td>
<td>.000</td>
<td>.436</td>
</tr>
<tr>
<td>Error</td>
<td>48375.06</td>
<td>57</td>
<td>848.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>753430.00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>92769.7359</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 12: Adjusted Posttest Means of Edmark Posttest Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Adjusted Mean</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>8.07</td>
<td>80.13</td>
<td>78.99&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>2.71</td>
<td>38.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7.55</td>
<td>127.97</td>
<td>129.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>44.10</td>
</tr>
<tr>
<td>SD</td>
<td>2.73</td>
<td>24.62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Evaluated as covariates, appeared in the model: DRA Pretest = 7.80.

*<sup>n</sup> = 29

**<sup>n</sup> = 31
Hypothesis 3

As stated in Chapter I, null hypothesis 3 read as follows: There is no statistically significant difference in the level of reading comprehension, as measured by the Passage Comprehension subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group. In order to test this hypothesis, a stepwise multiple regression analysis was first used to determine the significance of the relationship between variables other than the independent variable (Edmark treatment) and the dependent variable, the WRMT-R Passage Comprehension Posttest. Variables considered were participant gender, status as repeater/nonrepeater, grade repeated (kindergarten, first, or none), and DRA Pretest scores. Because no pretest scores were available for the WRMT-R Passage Comprehension Posttest, the DRA Pretest scores obtained for each child by his or her classroom teacher at the beginning of the school year, before implementation of the intervention, were considered as a possible covariate. A bivariate correlation was performed on the DRA Pretest data and WRMT-R Passage Comprehension raw scores; Table 13 shows results of the Pearson Correlation.

The Pearson analysis using WRMT-R Passage Comprehension raw scores revealed a correlation significant at the 0.01 level (2-tailed), thus justifying the inclusion of the DRA Pretest data in the stepwise multiple regression. The level of significance for the regression was set at p<.05. One model was generated by the regression analysis. Table 14 indicates that one factor, Repeater/Nonrepeater Status, could be used to predict the WRMT-R Passage Comprehension scores.
Table 13: Pearson Correlation of DRA Pretest and WRMT-R Passage Comprehension Posttest Raw Scores

<table>
<thead>
<tr>
<th></th>
<th>DRA Pretest</th>
<th>WRMT-R Passage Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRA Pretest</td>
<td>Pearson Correlation 1.00</td>
<td>.356**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.005</td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>WRMT-R Passage</td>
<td>Pearson Correlation .356**</td>
<td>1.00</td>
</tr>
<tr>
<td>Comp.</td>
<td>Sig. (2-tailed)</td>
<td>.005</td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

**. Correlation significant at the 0.01 level (2-tailed).

Table 14: Variables Entered/Removed*

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Repeater/Nonrepeater Status</td>
<td>Stepwise (Criteria Probability-of-F-to enter &lt;=.050, Probability-of-F-to remove&gt;=.100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: WRMT-R Passage Comprehension Standard Score Posttest

As shown in Table 15, the adjusted $R^2$ indicated that Repeater/Nonrepeater Status could explain 15% of the variability in WRMT-R Passage Comprehension scores ($R^2=.15$). The significance level for this correlation was $p<.001$. See Appendix C for actual correlations of all dependent and independent variables.
Table 15: Model Summary of Repeater/Nonrepeater Status and Group

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.406a</td>
<td>.165</td>
<td>.150</td>
<td>13.63</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Repeater/Nonrepeater Status

To test the hypothesis that the amount of variance explained by the regression model (Table 15) was more than the variation explained by the average, the F ratio was used. In order to test the significance of the overall model, a coefficient of determination was computed by applying an ANOVA. As shown in Table 16, with F=11.43 the significance of Repeater/Nonrepeater Status as a predictor of the WRMT-R Passage Comprehension Posttest was p<.001.

Table 16: ANOVA of Repeater/Nonrepeater Statusa and WRMT-R Passage Comprehension Posttestb

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>2125.38</td>
<td>1</td>
<td>2125.38</td>
<td>11.43</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>10781.21</td>
<td>58</td>
<td>185.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12906.58</td>
<td>59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Repeater/Nonrepeater Status
b. Dependent Variable: WRMT-R Passage Comprehension Standard Score Posttest

Based upon this analysis, Repeater/Nonrepeater Status was used as a covariate in the univariate analysis of covariance (ANCOVA) in order to increase statistical power and reduce bias. Of the 60 study participants, 17 were repeaters; 7 of the 29 control group students had repeated either kindergarten or first grade, as had 10 of the 31 experimental group students. Results of the analysis of covariance are presented in
Table 17, and adjusted post-mean determinations, using the DRA scores as pretest scores, are shown in Table 18. The $F$ value of 6.05 was statistically significant at the .05 level. The experimental group scored higher than the control group on the WRMT-R Passage Comprehension Posttest, and this difference was statistically significant.

**Table 17: One-Way ANCOVA of WRMT-R Passage Comprehension Posttest Scores by Group**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>3159.75</td>
<td>2</td>
<td>1579.87</td>
<td>9.24</td>
<td>.000</td>
<td>.245</td>
</tr>
<tr>
<td>Intercept</td>
<td>71472.53</td>
<td>1</td>
<td>71472.53</td>
<td>417.98</td>
<td>.000</td>
<td>.880</td>
</tr>
<tr>
<td>REPEATER</td>
<td>2382.48</td>
<td>1</td>
<td>2382.48</td>
<td>13.93</td>
<td>.000</td>
<td>.196</td>
</tr>
<tr>
<td>GROUP</td>
<td>1034.37</td>
<td>1</td>
<td>1034.37</td>
<td>6.05</td>
<td>.017</td>
<td>.096</td>
</tr>
<tr>
<td>Error</td>
<td>9746.84</td>
<td>57</td>
<td>171.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>462707.00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>12906.58</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 18: Adjusted Posttest Means of WRMT-R Passage Comprehension Posttest Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Adjusted Mean</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>8.07</td>
<td>82.86</td>
<td>82.27&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>2.71</td>
<td>16.51</td>
<td></td>
<td>6.05</td>
</tr>
<tr>
<td>Experimental**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7.55</td>
<td>90.06</td>
<td>90.62&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>2.73</td>
<td>12.24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Evaluated as covariates, appeared in the model: Repeater/Nonrepeater Status = 1.28.

*<sup>n</sup> = 29

**<sup>n</sup> = 31

In order to determine how much the treatment affected the WRMT-R Passage Comprehension Posttest scores, effect size, or Cohen's $d$, was calculated. Cohen's $d$ is the difference between control and experimental treatment posttest mean scores divided by the pooled standard deviation (Swanson, 1999). This calculation yielded an effect size of .49. According to Kenny (1987), .5 is considered a medium $d$. The moderate treatment effect size of .49, supported the finding of a significant difference between the experimental and control group Passage Comprehension scores.

Hypothesis 4

As stated in Chapter I, null hypothesis 4 read as follows: There is no statistically significant difference in the level of letter identification, as measured by the Letter Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.
In order to test this hypothesis, a stepwise multiple regression analysis was first used to determine the significance of the relationship between variables other than the independent variable (Edmark treatment) and the dependent variable, the WRMT-R Letter Identification Posttest. Variables considered were participant gender, status as repeater/nonrepeater, grade repeated (kindergarten, first, or none), and WRMT-R Letter Identification Pretest scores. The level of significance was chosen as $p<.05$. Two models were generated by the regression analysis. Table 19 indicates that two factors, WRMT-R Letter Identification Pretest and Grade Repeated could be used to predict the WRMT-R Letter Identification Posttest scores.

**Table 19: Variables Entered/Removed**

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WRMT-R Letter ID SS Pretest</td>
<td>Stepwise (Criteria Probability-of-F-to enter $&lt;=$.050, Probability-of-F-to remove $&gt;=$.100).</td>
</tr>
<tr>
<td>2</td>
<td>Grade Repeated</td>
<td>Stepwise (Criteria Probability-of-F-to enter $&lt;=$.050, Probability-of-F-to remove $&gt;=$.100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: WRMT-R Letter Identification Standard Score Posttest

As shown in Table 20, the adjusted $R^2$ indicated that the WRMT-R Letter Identification Pretest standard scores could explain 64% of the variability in WRMT-R Letter Identification Posttest scores ($R^2=.64$). When Grade Repeated was added to the model, the WRMT-R Letter Identification Pretest standard scores combined with Grade Repeated could explain 67% of the variability in WRMT-R Word Identification Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Posttest scores ($R^2=.67$). The significance level for these correlations was $p<.001$. The two variables were therefore considered as covariates in the subsequent data analysis. See Appendix C for actual correlations of all dependent and independent variables.

**Table 20: Model Summary of WRMT-R Letter Identification SS Pretest and Grade Repeated**

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R$ Square</th>
<th>Adjusted $R$ Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.804a</td>
<td>.647</td>
<td>.641</td>
<td>8.22</td>
</tr>
<tr>
<td>2</td>
<td>.824b</td>
<td>.679</td>
<td>.668</td>
<td>7.90</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), WRMT-R Letter ID Standard Score Pretest  
b. Predictors: (Constant), WRMT-R Letter ID Standard Score Pretest, Grade Repeated

To test the hypothesis that the amount of variance explained by the regression model (Table 20) was more than the variation explained by the average, the $F$ ratio was used. In order to test the significance of the overall model, a coefficient of determination was computed by applying an ANOVA. For Model 1, shown in Table 21, with $F=106.18$ the significance of the WRMT-R Letter Identification SS Pretest as a predictor of the WRMT-R Letter Identification SS Posttest was $p<.001$. For Model 2, also shown in Table 21, with $F=60.38$ the significance of the WRMT-R Letter Identification SS Pretest and Grade Repeated as predictors of the WRMT-R Letter Identification SS Posttest was $p<.001$. 

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Table 21: ANOVA of WRMT-R Letter Identification SS Pretest\textsuperscript{a}, Grade Repeated\textsuperscript{b}, and WRMT-R Letter Identification SS Posttest\textsuperscript{c}

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>7179.43</td>
<td>1</td>
<td>7179.43</td>
<td>106.18</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>3921.55</td>
<td>58</td>
<td>67.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>11100.98</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>7541.49</td>
<td>2</td>
<td>3770.75</td>
<td>60.38</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>3559.49</td>
<td>57</td>
<td>62.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>11100.98</td>
<td>59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), WRMT-R Letter ID SS Pretest
b. Predictors: (Constant), WRMT-R Letter ID SS Pretest, Grade Repeated
c. Dependent Variable: WRMT-R Letter ID SS Posttest

Based upon this analysis, WRMT-R Letter Identification Pretest Standard Scores and Grade Repeated were used as covariates in the univariate analysis of covariance (ANCOVA) in order to increase statistical power and reduce bias. Of study participants, 7 of the 29 control group students were classified as repeaters, with 4 having repeated kindergarten and 3 currently repeating first grade. In the experimental group, 10 of the 31 participants were classified as repeaters, with 4 having repeated kindergarten and 6 currently repeating first grade. Results of the analysis of covariance are presented in Table 22, and adjusted post-mean determinations are shown in Table 23. The F value of 3.42 was not statistically significant at the .05 level. While the experimental group scored higher than the control group on the WRMT-R Letter Identification Posttest, there was not a statistically significant difference between the two groups.
**Table 22: One-Way ANCOVA of WRMT-R Letter Identification Posttest Standard Scores by Group**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>7746.42</td>
<td>3</td>
<td>2582.14</td>
<td>43.11</td>
<td>.000</td>
<td>.698</td>
</tr>
<tr>
<td>Intercept</td>
<td>1083.28</td>
<td>1</td>
<td>1083.28</td>
<td>18.08</td>
<td>.000</td>
<td>.244</td>
</tr>
<tr>
<td>LETTERID</td>
<td>4701.67</td>
<td>1</td>
<td>4701.67</td>
<td>78.49</td>
<td>.000</td>
<td>.584</td>
</tr>
<tr>
<td>GRREPEAT</td>
<td>415.35</td>
<td>1</td>
<td>415.35</td>
<td>6.93</td>
<td>.011</td>
<td>.110</td>
</tr>
<tr>
<td>GROUP</td>
<td>204.93</td>
<td>1</td>
<td>204.93</td>
<td>3.42</td>
<td>.070</td>
<td>.058</td>
</tr>
<tr>
<td>Error</td>
<td>3854.56</td>
<td>56</td>
<td>59.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>515451.00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>11100.98</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 23: Adjusted Posttest Means of WRMT-R Letter ID Standard Scores**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Adjusted Mean</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>90.10</td>
<td>90.69</td>
<td>89.76&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>16.53</td>
<td>13.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental**</td>
<td></td>
<td></td>
<td></td>
<td>3.42</td>
</tr>
<tr>
<td>M</td>
<td>88.32</td>
<td>92.61</td>
<td>93.48&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>15.07</td>
<td>14.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Evaluated as covariates, appeared in the model: WRMT-R Letter ID SS Pretest = 89.18, Grade Repeated = 2.57.

*<sup>n</sup> = 29

**<sup>n</sup> = 31
In order to determine how much the treatment affected the WRMT-R Letter ID Posttest standard scores, effect size, or Cohen’s $d$, was calculated. Cohen’s $d$ is the difference between control and experimental treatment posttest mean scores divided by the pooled standard deviation (Swanson, 1999). This calculation yielded an effect size of 0.14; an effect size of 0.2 is considered small (Kenny, 1987). This very small effect size supported the finding of no significant difference between experimental and control group students on the Letter Identification subtest.

**Hypothesis 5**

As stated in Chapter I, null hypothesis 5 read as follows: There is no statistically significant difference in the level of phonetic decoding, as measured by the Word Attack subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group. In order to test this hypothesis, a stepwise multiple regression analysis was first used to determine the significance of the relationship between variables other than the independent variable (Edmark treatment) and the dependent variable, the WRMT-R Word Attack Posttest. Variables considered were participant gender, status as repeater/nonrepeater, grade repeated (kindergarten, first, or none), and WRMT-R Word Attack Pretest scores. The level of significance was chosen as $p<.05$. No models were generated by the regression analysis, indicating that no entered variables could be used to predict the WRMT-R Word Attack Posttest scores. As seen in Appendix C, correlation coefficients for the Word Attack subtest and other considered variables were not significant.
Based upon this analysis, no covariates were used in the statistical analysis. Results of the analysis of variance (ANOVA) are presented in Table 24, and pre- and post-test means are shown in Table 25. The $F$ value of .01 was not statistically significant at the .05 level; the control and experimental group means on the WRMT-R Word Attack Posttest were 83.52 and 83.84, respectively. There was therefore no statistically significant difference between the two groups.

**Table 24: One-Way ANOVA of WRMT-R Word Attack Posttest Standard Scores by Group**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1.55</td>
<td>1</td>
<td>1.55</td>
<td>.01</td>
<td>.921</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>419653.42</td>
<td>1</td>
<td>419653.42</td>
<td>2713.65</td>
<td>.000</td>
<td>.979</td>
</tr>
<tr>
<td>GROUP</td>
<td>1.55</td>
<td>1</td>
<td>1.55</td>
<td>.01</td>
<td>.921</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>8969.44</td>
<td>58</td>
<td>154.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>429145.00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>8970.98</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In order to determine how much the treatment affected the WRMT-R Word Attack Posttest standard scores, effect size, or Cohen's $d$, was calculated. Cohen's $d$ is the difference between control and experimental treatment posttest mean scores divided by the pooled standard deviation (Swanson, 1999). This calculation yielded an effect size of .03, which can be viewed as nonsignificant, as .2 is considered small (Kenny, 1987). This effect size supported the finding of no significant difference between the experimental and control groups on the Word Attack subtest.

Finally, in order to investigate the interaction between Repeater/Nonrepeater Status and Group (Control or Experimental), a 2 x 2 general factorial analysis was performed for each of the five dependent variables (WRMT-R Word Identification Posttest, Edmark Level 1 Posttest, WRMT-R Passage Comprehension Posttest, WRMT-R Letter Identification Posttest, and WRMT-R Word Attack Posttest). Results of the univariate analysis of variance, as shown in Table 26, revealed no significant interaction between Repeater/Nonrepeater Status and Group (Control or Experimental).

### Table 25: Pre- and Posttest Means of WRMT-R Word Attack Standard Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>75.72</td>
<td>83.52</td>
</tr>
<tr>
<td>SD</td>
<td>8.17</td>
<td>12.45</td>
</tr>
<tr>
<td><strong>Experimental</strong>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>74.29</td>
<td>83.84</td>
</tr>
<tr>
<td>SD</td>
<td>15.07</td>
<td>14.05</td>
</tr>
</tbody>
</table>

* $n = 29$
** $n = 31$
for any of the five dependent variables. The results indicated that Control and Experimental Group students did not perform differently based on their status as a Repeater or Nonrepeater.

**Table 26: Test for Interaction Effects of Repeater/Nonrepeater Status and Group**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word ID Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUP * REPEATER</td>
<td>.52</td>
<td>1</td>
<td>.52</td>
<td>.003</td>
<td>.953</td>
</tr>
<tr>
<td>Edmark Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUP * REPEATER</td>
<td>470.91</td>
<td>1</td>
<td>470.91</td>
<td>.465</td>
<td>.498</td>
</tr>
<tr>
<td>Passage Comp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUP * REPEATER</td>
<td>36.84</td>
<td>1</td>
<td>36.84</td>
<td>.212</td>
<td>.647</td>
</tr>
<tr>
<td>Letter ID Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUP * REPEATER</td>
<td>14.82</td>
<td>1</td>
<td>14.82</td>
<td>.109</td>
<td>.743</td>
</tr>
<tr>
<td>Word Attack Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUP * REPEATER</td>
<td>63.80</td>
<td>1</td>
<td>63.80</td>
<td>.425</td>
<td>.517</td>
</tr>
</tbody>
</table>

**Summary of Analysis of Quantitative Data**

In order to analyze the quantitative data collected in this study, stepwise multiple regressions were performed to determine the significance of the relationship between variables other than the independent variable (Edmark treatment) and the dependent variables, the five posttests administered to participants. The variables explaining the greatest part of the variability in posttest scores were then considered as covariates in the five univariate analyses of covariance (ANCOVA) in order to increase
statistical power and reduce bias. Finally, Cohen's $d$, or effect size, was calculated to determine how much the treatment effected the five posttest standard scores.

For Hypothesis 1, the WRMT-R Word Identification Pretest Standard Scores and Grade Repeated were used as covariates in the univariate analysis of covariance (ANCOVA) of the WRMT-R Word Identification Posttest Standard Scores. The resulting $F$ value of .602 was not statistically significant at the .05 level. Null Hypothesis 1, predicting no significant differences between control and experimental groups on this dependent variable was accepted. Calculation of Cohen's $d$ yielded an effect size of .19, which is small, and therefore supported the result of no significant difference between control and experimental group means on the Word Identification Posttest.

For Hypothesis 2, DRA Pretest Score was used as a covariate in the univariate analysis of covariance (ANCOVA) of the Edmark Level 1 Posttest scores. The resulting $F$ value of 44.10 was statistically significant at the .05 level. Null Hypothesis 2, predicting no significant differences between control and experimental groups on this dependent variable was not accepted. Calculation of Cohen's $d$ yielded an effect size of 1.2, which is extremely large, and therefore helped explain the treatment effect in the program.

For Hypothesis 3, Repeater/Nonrepeater Status was used as a covariate in the univariate analysis of covariance (ANCOVA) of the WRMT-R Passage Comprehension Posttest Standard Scores. The resulting $F$ value of 6.05 was statistically significant at the .05 level. Null Hypothesis 3, predicting no significant differences between control
and experimental groups on this dependent variable was not accepted. Calculation of Cohen's $d$ yielded an effect size of .49, which is medium, and therefore helped to explain the treatment effect in the program.

For Hypothesis 4, WRMT-R Letter Identification Pretest Standard Scores and Grade Repeated were used as covariates in the univariate analysis of covariance (ANCOVA) of the WRMT-R Letter Identification Posttest Standard Scores. The resulting $F$ value of 3.42 was not statistically significant at the .05 level. Null Hypothesis 4, predicting no significant differences between control and experimental groups on this dependent variable was accepted. Calculation of Cohen's $d$ yielded an effect size of .14, which is small, and therefore supported the result of no significant difference between control and experimental group means on the Letter Identification Posttest.

For Hypothesis 5, no models were generated by the stepwise multiple regression analysis, and therefore no variables were used as covariates. An analysis of variance (ANOVA) was used to examine WRMT-R Word Attack Standards Scores. The resulting $F$ value of .01 was not statistically significant at the .05 level. Null Hypothesis 5, predicting no significant differences between control and experimental groups on this dependent variable was accepted. Calculation of Cohen's $d$ yielded an effect size of .03, which is considered nonsignificant, and therefore supported the result of no significant difference between control and experimental group means.

Finally, in order to investigate the interaction between Repeater/Nonrepeater Status and Group (Control or Experimental), a 2 x 2 general factorial analysis was
performed for each of the five dependent variables. Results revealed no significant interaction between Repeater/Nonrepeater Status and Group.

Analysis of Qualitative Data

The qualitative data in this study were collected in the form of field notes taken during and after weekly observation of tutoring and oral reading sessions, interviews with key informants, and inspection of supporting documentation in the form of student report cards. As explained by Strauss (1996), qualitative researchers generate their data through field observations, interviewing, and examination of documents. Prior to the implementation of the intervention, the researcher conducted individual, semi-structured interviews with the 62 first graders who were participants in the study at their respective schools; interview questions for participants and key informants are listed in Appendix B. In addition, the kindergarten teachers, or first grade teachers in the case of repeating first graders, who taught the participants during the 1998-99 school year were interviewed by the researcher. The principal and assistant principal at each of the three participating public elementary schools were also interviewed.

During the course of the intervention, which took place during the first semester of the 1999-2000 school year, the researcher observed each America Reads volunteer tutor once each week during her tutoring (experimental group) and/or oral reading (control group) sessions. Observations during those weekly visits were recorded as field notes, as were comments by tutors, classroom teachers, and participants to the researcher. At the conclusion of the intervention, at the end of the first semester and after all 60 remaining students took the posttests, the researcher
again interviewed the first grade participants individually at their respective schools. The participants’ first grade teachers were interviewed, along with the principals and assistant principals of the three participating schools. In addition, the researcher conducted telephone interviews with all parents or guardians of the participants who had working telephone numbers. All post-intervention interview questions can also be found in Appendix B.

Content analysis was used to analyze the qualitative data collected in the study. According to Patton (1990), content analysis is the process of identifying, coding, and categorizing primary patterns in data collected. Data from field notes and interviews were labeled as the first step in a classification system, as recommended by Patton. Recurring regularities or patterns were then identified and categories for discussion were determined. Additionally, the analysis of the field notes and interviews with participants and key informants was guided by the research questions posed in this study:

1. Will a pattern of responses concerning the reading performance of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester?

2. Will a pattern of responses concerning the attitudes toward reading of first grade students identified as being at-risk for reading failure emerge from
interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the 

Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester?

3. Will a pattern of responses concerning the attitudes toward school of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the 

Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester?

4. Will a pattern of responses concerning the attitudes toward self of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the 

Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester?

The researcher looked for triangulation or structural corroboration of data (Eisner, 1998) by inspecting students' report cards and by looking for agreement in responses to interview questions across informants.

**Analysis of Field Notes**

The following themes or topics emerged from a content analysis of researcher field notes collected weekly for each intervention site: setting, tutor's fidelity to
program administration, tutor-student interaction, characteristics of students' reading, students' enjoyment of the program, problematic student behavior, and indicators of program success and failure. In all descriptions of participants and key informants, pseudonyms have been substituted for actual names.

Setting. Thirty participants in this study attended School A, which served approximately 430 kindergarten through fifth grade students. The school was designated as a Title I school, with 74% of its students receiving free or reduced lunches. For the first three months of the intervention, two America Reads volunteers served as tutors. Due to the volunteers' college class schedules, one tutor served 26 experimental and control group students, while the other tutored 4 experimental group students. At the beginning of the winter quarter, a third America Reads volunteer took over program implementation with all 30 of School A participants.

The physical locations in which the tutoring and oral reading took place were problematic from the beginning at School A due to the absence of unused space anywhere in the school. One first grade teacher, who had 12 members of her class involved in the intervention, allowed the volunteer tutor to use a small room adjacent to her classroom. This narrow room served as a coat closet and storage area; there was just enough room for two student desks for the volunteer and one first grader. The light in the room was dim, as boxes were stacked up in front of the room's only window; the researcher brought a small lamp to increase illumination to an adequate level. The tiny room was often cold, and the bathroom located at one end of it could often emit a less than pleasant odor. Despite these less than ideal conditions, the room
did provide a distraction-free, relatively quiet space for the tutors and participating children.

Because it was seen as inappropriate to bring children from other classes into this teacher's classroom in order to access this room, the experimental group children in two other classrooms received the tutoring in their respective rooms. Control group students were read aloud to in two groups in a second grade classroom that was vacant during second grade lunch period. One of the classrooms in which tutoring was done was an at-risk class led by a first year teacher. This teacher’s inability to control the class resulted in her being given formal assistance from the school district. At the beginning of the year, her room was extremely chaotic, with a high noise level, as students talked freely and walked around the room. While the teacher gained more control as the semester went on, and the noise level decreased, it still remained a less than optimal environment for one-on-one tutoring.

The second classroom in which tutoring was delivered had an experienced teacher who skillfully controlled her students. Two of the students, however, were hearing impaired, so the teacher spoke very loudly and all audio and videotapes were played near maximum volume for their sakes. Amazingly, the tutored experimental group children in these two classes were able to attend to the Edmark program, seemingly oblivious, for the most part, to the noise in the classroom. The fact that they still attended somewhat to the distractions in the environment was made clear when they would answer a question the teacher had directed to the class, or make a comment related to what was going on in the room. In both rooms, the teachers’ absence and
replacement by substitute teachers on occasion resulted in much more chaotic, noisy environments. And yet, the tutored children carried on, appearing much more able to block out the background noise and movement than were the tutors or researcher.

School B, with 10 participating students, had the most ideal environment for the intervention. The largest participating school, serving 550 kindergarten through 5th grade students, School B also had the lowest percentage of children receiving free or reduced lunches (59%) and the most available space. The School B tutor was able to bring her students to a full-size classroom used for French, but empty during the tutoring time. While this environment was noise- and distraction-free, it did have the one disadvantage of being physically distant from participants' classrooms; tutoring time was therefore reduced by several minutes of travel time to and from first grade classrooms. The tutor at School B quit the program at the end of the quarter (mid-November 1999) due to termination of her financial aid, and was replaced with another America Reads volunteer, who also replaced the School A tutor of four students when that tutor also quit for the same reason in mid-November.

School C, which served 460 kindergarten through 5th grade students, was also considered a Title I school, having 85% of its children receiving free or reduced lunches. The tutor at this school was able to use a corner of the school library which was partitioned off and used at other times by the Gifted Education teacher. Because the library was so large (it had formerly been the school's multipurpose room), there was very little noise and no visual distractions due to the partitions. The tutor at this school remained for the entire first semester.
At all three schools, the normal interruptions of elementary school life (parties, field trips, assemblies) prevented the intervention from taking place on numerous occasions during the semester. On one Friday, a very frustrated tutor called the researcher, reporting that they had had a tornado drill, the Fire Marshall had come, and vision and hearing screenings had been conducted—all during her tutoring time and all within one week.

**Fidelity to Program Administration.** In addition to initially training each tutor in the *Edmark Reading Program* and reading aloud to the control group students, the researcher observed each tutor once a week during the semester of the intervention and examined each student’s *Edmark* response booklet, in which all lessons taught and words missed were recorded. A brief checklist was developed to assure that volunteers were continuing to implement the program appropriately. The checklist assessed (a) the introduction of new words, (b) the correction of missed words, (c) the verbal direction to “Find ____ (the stimulus word presented with two distracters)”, (d) the verbal direction to “Read (the stimulus word or sentence)”, and (e) the use of verbal reinforcement. Early into the intervention the researcher reminded tutors once or twice to follow procedure on missed words; after those few reminders, all tutors were diligent in following program procedures. As the children became more familiar with the program, it was no longer necessary for any of the tutors to tell them to “Read” the words or sentences, as they did so independently. One tutor, assigned to School B, did have to be reminded to use frequent verbal reinforcement at the beginning of the
program, but she soon reinforced appropriately and consistently, as did the other tutors.

The greatest concern regarding implementation of the program was the first tutor at School B and one of the original tutors at School A missing numerous days. Both tutors quit at the end of the first semester and were replaced by a volunteer who was much more conscientious regarding attendance. Throughout the semester, the researcher was available to all tutors to answer any questions they had concerning program implementation and to offer suggestions. When several tutors commented that some students already knew several of the words taught each week, for example, the researcher trained all tutors in how to pretest every set of 10 words taught and skip the lessons pertaining to words they had already mastered. While the tutors were initially trained to give very frequent verbal reinforcement, as the students progressed the researcher instructed the tutors on fading out this reinforcement somewhat, saving it for reading long, complex sentences, rather than for reading each word in isolation, as was initially done.

Tutor-Student Interaction. A consistent observation by the researcher was the quality of interaction between tutors and children. While none of the volunteers were certified teachers, they all displayed very positive ways of interacting with the children. While the initial tutor at School B was the weakest of the five volunteers in terms of attendance and initial verbal reinforcement, she did offer more praise as the semester went on, and displayed concern for the students. Because all her control group students
were African-Americans, she carefully chose books that she considered rich in African-American culture, history, and traditions to read to the children.

The tutor at School C was extremely calm, soft-spoken, and patient with her 20 students. Her concern for the children was evident as she would hand them tissues to wipe runny noses, delight in stories of lost teeth, or stoop to tie stray tennis shoe laces. Her sense of humor was excellent, even when she was undergoing serious problems in her personal life, and her enthusiasm with the children was contagious.

The initial School A tutor who served 26 of the 30 children was also skillful in her interactions with the children. Her verbal reinforcement often explained exactly what the child did so well: "Good. I like the way you corrected yourself and noticed the plural," or "Good. You caught the 's'. Not everybody does. Awesome!" Her affect was always positive, and reassuring; her enjoyment of each child was evident. This tutor adjusted her style to best fit each child's personality, remaining quiet and calm with a child who was largely non-verbal, for example, and then becoming more playful with the more animated children. For all students, she kept a brisk pace of instruction, which is important to the program's successful implementation. The first grade teacher who allowed the use of her coat room complimented this volunteer often and told the researcher how sorry she was to lose her when the quarter ended and the volunteer left the program.

The volunteer who replaced this tutor was also excellent with the students, calm, patient, caring, and generous with verbal reinforcement. In like manner, the tutor who replaced the volunteer at School B and the volunteer with four students at School
A made a seamless transition, continuing adherence to the program guidelines while treating students with respect, firm guidance, and appropriate reinforcement. The second initial volunteer at School A, who tutored four students, also had difficulty with attendance and quit at the end of the first quarter. She was very competent with the children, however, and was consistently affectionate, yet firm.

**Students’ Enjoyment of the Program.** One of the most obvious aspects of the intervention was the students’ desire to come to either the one-on-one tutoring or the control group reading sessions. When this study was proposed, concern was expressed over causing possible embarrassment for children by taking them out of their regular classrooms. This, however, was not the case; in fact, children not in the study begged to be allowed to leave the room with the tutor. Perhaps the most difficult aspect of the intervention was having first graders who were not participants run up, hug the researcher, and ask repeatedly if they could “go read, too” every time the researcher was on campus for testing, interviews, or observations.

The majority of the children in the experimental group were usually smiling when the researcher observed their sessions. They smiled when their tutors verbally reinforced their responses, they smiled when handed Picture/Phrase cards to complete (see Appendix A for a complete description of the program components), and they smiled when they successfully took the posttests that occurred after the introduction of every 10 words. First grader Laura would exclaim “Ooh!” as her volunteer brought out the *Edmark* storybook, delighted to read. Crystal, who received her language arts instruction in a special education resource room setting would smile and laugh as she
completed a Direction Card activity by matching pictures of objects and animals to sentences. "My lord, we need three pencils!" she would say in delight as she searched for three pictures of pencils. Danasha would often tell her tutor, "I don't want you to get no one else but me," indicating her desire for her 15 minute session not to end. When the same child completed the last lesson in Level I of Edmark, and her tutor told her it was the last test, she said, "NO!" getting very upset, thinking the program was over. When the volunteer assured her she could continue in Level II of the program, Danasha smiled broadly. When the tutor related Danasha's making the Honor Roll at school (during the third month of the program), the researcher said, "I bet your mom was proud." "Yes," beamed Danasha, "she was jumping up and down!" On another occasion when the tutor's watch had stopped and she asked the researcher how much time were left in the 15-minute session, Danasha interjected, "Five hundred minutes!"

Across schools and tutors, a desire to continue the sessions beyond the allotted 15 minutes was common. The control group students, too, looked forward to their daily sessions and greeted the tutors with hugs and grins.

**Student Behavior.** While the majority of students eagerly looked forward to their time with the volunteers, there were several children in the study who were not as positive. One experimental group student at School B complained when he thought he was going to miss a special activity, such as "fun Friday," in his classroom. This child, Thomas, was extremely distractible and exhibited much motor hyperactivity. He showed little respect for the tutor and was often noncompliant, yet his progress in the program was one of the best at his school. Another child, at School A, became
extremely upset and cried whenever he missed a word, even though his tutor told him it was "OK" and that he was doing a good job. Dovontae never smiled, whined and complained often, was sometimes defiant and disrespectful to the tutor, and appeared to carry much anger inside of himself. A third student, also at School A, was extremely distractible and hard to keep on-task. He, unfortunately, received tutoring in his at-risk classroom. Marcus was often argumentative, would stand up, lean on the researcher, and put his head on his desk. Often, however, his misbehavior was related to wanting to do additional lessons in the program. On one occasion, he completed only one lesson because he read extremely slowly and was frequently distracted and off-task. When he wanted to do more, and was told his 15 minutes were up and the tutor had to work with the next child, he put his head down and cried.

Another child at School A presented a problem only when he had not taken his Ritalin. At those times, he was extremely distractible, spoke loudly, rapidly, and continuously, and exhibited extreme motor hyperactivity. The school had run out of the supply of Ritalin provided by his parent, and neither the home telephone number nor the emergency number given to the school were working numbers.

In contrast to these few children who exhibited behavioral problems, the majority of the experimental group children were eager to learn, compliant, and attentive. It was noteworthy that teachers reported having problems with almost all the students in the study when they were in their regular classrooms. It was consistent with the researcher's experience with one-on-one instruction that most children present no behavioral problems when given individualized attention on their instructional, rather
than frustrational, levels, which results in success experiences. The control groups were an entirely different experience for both students and tutors, however. While the control group participants also wanted to come to their daily sessions, their behavior, in the words of one tutor, "was horrible." According to the tutors, the students greeted them enthusiastically each day and pleaded to be read aloud to, but during the sessions the majority of them talked and did not listen to the stories. All tutors consistently complained to the researcher during the semester regarding their difficulty in keeping the control group quiet and attentive. Interestingly, several control group students discussed the misbehavior of their peers during the sessions in their post-intervention interviews.

**Reading Behaviors.** The majority of experimental group students showed many positive behaviors indicative of growing skills in reading. Most of the children exhibited the ability to self-correct when they mis-read a word. They would either do this spontaneously, or the tutors would point to the misread word with their pens, without saying anything, and the children would be able to correct their error the majority of the time. This silent pointing at the missed word eliminated any negativity from the sessions. When just pointing at the stimulus word was not enough, the tutors would say, "No, try again," or, "Are you sure?" rather than telling them "You’re wrong." This was congruent with the Edmark program’s philosophy of positive reinforcement and errorless discrimination.

Whether they read quickly or slowly, the majority of students read quietly, calmly, and with a steady pace. Most took the reading tasks seriously and appeared to
give their best effort. They were not too serious to interact in a humorous way with the text, however. When one female student read, "We eat orange ice cream," she immediately said "YUCK!" "A good banana is yellow, not green" was followed by a strong "UCK!"

The children's interaction with the text grew as the semester continued. Many children spontaneously made up sentences containing words they read (e.g., "New" (the stimulus word). "That is a new kind of squirrel" (the made-up sentence).) A majority of the students answered the questions asked by the stimulus sentences (e.g., "What do squirrels eat?" (stimulus sentence). "Acorn" (made up by child).) Students also expressed curiosity about words, often pointing to the distracter words or groups of letters and asking, "What is that word?" They appeared to especially enjoy the Storybook stories, getting very excited as they read ("Oh, he got the egg!!").

It was extremely interesting to note that several of the students could not identify all letters of the alphabet, yet they were fairly successful in the program. When students missed a word and could not self-correct, tutors would have them trace and say the letters of the word, then say the word. Throughout the intervention, several students had to be told the letter names. The researcher also made an interesting discovery during the last month of the intervention when she substituted for a tutor. One student, who had completed fewer lessons than most, improved his reading fluency, accuracy, and speed significantly when he was allowed to turn the text at a 90 degree angle. The researcher shared this information with his teacher, who reported his
always trying to turn his books sideways, and with the head of Pupil Appraisal, whose office had recently tested the child for special education services.

**Success and Failure.** The child described above was not the only participant in the study who was tested for special education placement during the time of the intervention. While one overarching question was whether or not the intervention could prevent reading failure, several experimental group students were tested and placed in special education resource rooms during the study. One child at School B was label Developmentally Delayed and began receiving language arts instruction in the Resource Room in early December. The teacher of a second experimental group student at School B wanted the child to return to kindergarten, but parents would not agree. One School C student qualified for one hour of resource room service daily due to his language disorder. Finally, two students at School A received language arts instruction in a resource room, but this placement was in effect before the intervention began. In a personal telephone communication with the researcher, a member of the participating parish’s pupil appraisal office explained that any children who began receiving services during the first semester were referred during the previous school year. If referrals were made by School Building Level Committees and parental permission for evaluation were received at the beginning of the school year, pupil appraisal would have until December 2 to complete their evaluation. At that time, special education has an additional 30 days to hold the children’s IEP conferences, obtain parental permission for placement, and initiate services.
Teachers of the participating students brought several success stories to the researcher’s attention. The progress made during the semester by several children was striking. In December, a teacher at School B told the researcher that her student, Karl, who received Edmark tutoring, had gone from “not being able to do anything” and routinely scoring 10% on reading tests, to being placed on the school’s Honor Roll.

One first grade teacher at School A reported her concern for experimental group student Jermarious at the beginning of October, explaining that he knew no sounds and was extremely behind in reading; she was considering referring him for special education evaluation. At the end of October, she very excitedly told the researcher that Jermarious had scored 85% on the reading unit test, and he only missed the questions on subject/verb agreement (e.g., “He _____. play or plays”) which could have been due to dialectical differences rather than reading skill.

Two School A students, Jerralyn and Kinesha (who was considered non-verbal by her teacher), were recognized among the “Most Improved Students in Reading” on a poster outside the school computer lab. In all, four experimental group students and five control group students from a total of 30 participants at School A achieved Honor Roll status during the intervention; this required an overall GPA of 3.0 or above. At School B, three experimental group students and two control group students made the Honor Roll from a total of 10 participants, while School C had one experimental group student from a total of 20 participants on the school’s Honor Roll. The students’ attainment of Honor Roll status was not expected, as all participants were purposefully selected by their teachers and principals as having the lowest 20 to 30% of reading...
grades in their classes. Finally, while the study was conceptualized to take experimental group students through Level I of the *Edmark Reading Program*, 16 students had begun Level II by the end of the study.

**Pre-Intervention Interviews**

Before the implementation of the intervention, the principals and assistant principals, the participants, and their teachers during the 1998-99 school year were interviewed by the researcher. As suggested by Eisner (1998) a response analysis was performed on all interview data.

**Principals.** When asked what they would expect the reading performance and grades of the bottom 20% of first graders at their school to be, all three principals had similar responses. Principals at Schools B and C expected mid-kindergarten reading levels and grades of D’s or F’s. The principal of School B added that he hoped their grades would rise to C’s and D’s by the end of the year. The School A principal predicted the bottom reading level and failing grades for “quite a few.”

When their view of these children’s ability was solicited, principals of Schools B and C both mentioned the role environment may have played in this group’s achievement; principal of School C believed all had normal ability, but their background experiences had left them “impaired.” While the principal of School A also named environment as a factor, he added the role of heredity in differing ability levels.

The principals did not agree on the children’s attitudes towards school. The principal of School B stated that school was frustrating rather than enjoyable for these children. The principal of School A agreed that many of these at-risk students do not
like school, but pointed to their having other concerns, such as where they will sleep that night, and not knowing what school is all about. The principal of School C, the highest poverty level school in the study, however, stated these children like school and “are as excited about learning as the top kid in the room at this age.” He did go on to explain, however, that if they meet defeat after defeat, by third grade they will be “all washed up.”

**Assistant Principals.** The assistant principals agreed that at-risk students would probably make D’s or F’s. The assistant principal at School B pointed out the students’ problems with letter and sound recognition, and teachers’ complaints that these children could not remember two-letter words. School C’s assistant principal described these children as non-readers and explained two of the first grade teachers had already requested to use the last kindergarten basal reader with their classes.

When questioned on the students’ ability, the assistant principals largely echoed the views of their respective principals. School B’s assistant principal said she would like to believe 50% of the at-risk students could achieve with educational support, as their major problem was environment. The assistant principal at School C believed, like her principal, that the ability was there, but the lack of home support, including no school supplies or help on homework, affected their performance. Echoing her principal’s mention of heredity and environment, School A’s assistant principal did not believe the children’s ability could be brought up significantly, although she encouraged parents’ giving their children attention and help.
The assistant principals at Schools A and B disagreed with their principals' perceptions of at-risk students' attitudes towards school. While principals A and B believed this group did not enjoy school, all the assistant principals pointed to the students’ enjoyment of the caring, consistency, and structure they receive at school, although the assistant principal at School A related seeing the children frustrated and crying when they could not do their class work.

Kindergarten/First Grade 1998-99 School Year Teachers. The participating children’s teachers during the previous academic year were interviewed regarding the students’ reading performance in their classes and their attitudes towards reading and school. When asked about the students’ reading performance in their classes, the 14 teachers interviewed were very similar in their responses. Several teachers spoke of one or two students who were average to low average in reading, but the majority described children who were very weak in reading skills. The majority described children who were either weak in all areas, or for whom reading was their weakest area. “All five were very weak readers,” said one teacher of her former students, “I believe all of them could have benefited from an extra year in kindergarten.” Several teachers spoke of wanting students to be retained, but the parents refused. “These students had only slightly above the minimum standards for kindergarten,” said another teacher. “All had to be retaught and retested in order to pass unit tests.”

Imaturity was mentioned by many of the interviewed teachers, as was a lack of confidence or being “unsure of self.” One teacher described her former student as having “ability, but no confidence in herself.” The majority of teachers discussed the
lack of home support, indicating that the children needed more help or more reinforcement at home. A few cited strong support at home as being largely responsible for the students’ passing.

When describing the students’ reading skills, almost every teacher cited difficulty learning and retaining phonograms. “None of these children have decoding,” said one teacher. Several commented that students learned “by sight, not by sound.” A few teachers mentioned that some students had not learned to identify alphabet letters by the end of kindergarten. Several referred to letter reversals and “dyslexic-type issues.”

Numerous teachers discussed the students’ weakest areas as being sight words and comprehension. Others pointed out that most of the students had difficulty with fill-in-the-blank reading tasks. Several teachers were concerned that the children who repeated kindergarten were “not knocking the top off” and some repeaters still had not mastered all sounds or alphabet letters. Several reported children “overcome with frustration.” Another teacher described one student’s “being read to, not reading on her own.”

When questioned about students’ attitudes toward reading and school in general, almost all teachers reported that the majority of students had positive attitudes towards both. Teachers reported good attitudes and attempts to do their best, a love of the socialization at school, and liking to learn. Many mentioned that students “loved to come to school and enjoyed being read stories.” The love of school, however, was often discussed along with difficulties in reading: “All seemed to enjoy school and
loved me to read to them. All struggled with the right words they were supposed to be able to read.” Many of the children were described as interested in learning to read, but lacking in readiness.

Not all reports were equally positive, however. “He wants to be able to read, but is not willing to try,” said one teacher. Negative attitudes were usually described along with poor self-image or self-esteem: “She has a poor attitude. She has ability, but no confidence in herself.” Children repeating kindergarten were mentioned several times as not liking reading: “He doesn’t like reading. There’s a lack of understanding.” Most of the times teachers discussed negative attitudes they also told of no support at home and/or chaotic homes. “As for her attitude,” explained one teacher, “she brings baggage from home.” “They had frequent absences and did not enjoy coming to school. Both girls slept in class and had poor self-images,” reported another. One teacher poignantly explained, “He went through trauma at home on a regular basis. He was confused about life in general, so school work just mixed right in with everything else that troubled him. He appeared lazy, with an ‘I don’t care attitude.’ ”

Students. All students participating in the study were first asked if they like to read and why or why not. Only one students answered no, and gave the reason, “Because I can’t spell hard words.” One student shrugged his shoulders and said, “I don’t know.” All other participants answered yes, with the most common reason given being “Cause it’s fun.” The next most common reason was because it “helps you to learn,” followed by reading’s ability to assure you pass to the next grade: “I like to read so I won’t be in kindergarten no more.” One positive variation on that response was,
“It’s fun to be smart.” Several students reported liking books and looking at the pictures. “I just can’t wait to read,” said one child, “I love to look at books and I want to read them.” Some liked to read even when admitting, “But I can’t really read,” and another seemed to like reading by default: “I don’t like radio.” One participant said he liked to read “so I can get an education,” and in words to warm the heart of any reading researcher, “Because it’s the most important thing in the world.”

When asked if they read at home, the majority of students answered yes, and their reasons echoed those given to the previous question. The most commonly given reasons were variations of “It makes you go to second grade. You learn,” or the more pragmatic version, “Because I want to learn and pass. Don’t want to flunk again.” Another common response was “Cause it’s fun.” Parental involvement played a role, as many students described their mothers helping them read, and one student explained, “Because I got some easy books.” Interesting responses included, “Because when I’m scared I have to read a book,” and “So I won’t have to watch TV.”

Fourteen students answered “No” to the question “Do you read at home?” and the majority gave the reason of lack of books: “I don’t have no books there at my home.” “My mom doesn’t give books to me. I need one of them first grade books my mom can read to me.” When given this response often, the researcher verified the fact that first graders were not allowed to bring home either their basal readers or the books they checked out of the school library. The other reasons given for not reading at home concerned the children’s lack of ability: “I don’t know how.” “I like to look at them, but I don’t read them.”
When asked if they liked their reading class at school, all students answered yes. The majority responded that it was fun to read, with the next most common response concerning their desire to learn and pass to second grade, “Cause if you don’t come to school you won’t learn anything.” One student answered, “Because it ain’t that hard,” pointing to the importance of being able to perform required tasks.

The students were finally asked if they liked school, and what they liked the best and the least about it. The students again were unanimous in liking school. Their favorite aspect of school was recess and playing outside. Reading and learning were, however, a close second. Other frequently mentioned favorites were math, homework, and breakfast or lunch. As one child explained, “I like eating—it makes me grow so I can learn all my sentences.” While many students could not name anything they did not like about school, the most commonly reported “least liked” things were violence related. Student responses included variations of the following responses: “People beating up my little brother and me,” “I don’t like folks hitting me or punching me,” and “I don’t like people that fight.”

Post-Intervention Interviews

At the completion of the first semester of the 1999-2000 school year, after all student participants were posttested, the students, their parents or guardians, their first grade teachers, and their principals and assistant principals were individually interviewed by the researcher using the interview questions listed in Appendix B. This section will present the qualitative analysis of those semi-structured interviews with participants and key informants.
**Principals.** Each principal was shown a list of the participants at his school. The list was divided into two columns, determined by the child’s experimental or control group status, but the columns were not labeled in any way and the principals were therefore not aware from reading the list which students were assigned to treatment or control groups. The three principals were then asked to describe any changes of which they were aware in the participants in terms of reading ability, reading grades, and attitudes about school.

The principal of School A was not aware of any changes in the students. His only comment was that one student (who was in the Control Group) had not been in the office as much recently, perhaps due to his spending more time in the Special Education resource room and less time in the regular classroom. The principal of School B knew that two students (both experimental group participants) had been brought before the School Building Level Committee (SBLC) the previous day to discuss on-going concerns regarding their academic progress. He also responded that another student (in the control group) was about to be placed in the Special Education resource room. The principal of School C was not aware of any changes in the students, and he interpreted this as meaning there had not been a "massive degeneration of ability with these children, as the teachers would have told me if they had bottomed out." When asked if he saw a difference in the two groups of children, Principal C responded no, that they were "all traditionally weak students, all basically alike." Neither Principal A nor Principal B were aware of any differences in the two groups.
Assistant Principals. The Assistant Principals at the three participating schools were also shown the list of the two groups of students at their schools, and were also given no indication which children were experimental or control group members. The Assistant Principals were also asked to describe any changes of which they were aware in the participants in terms of reading ability, reading grades, or attitudes about school. The Assistant Principal at School A was able to go down the list of 30 participants at her school and comment on the attitudes and behavior of 20 of the students. According to this administrator, two of the experimental group students had improved behaviorally, as had one control group participant. Two experimental group and two control group children had exhibited worse behavior since the beginning of the year. Three experimental group students were described as having problems with behavior or attitude, as were six control group students. Four experimental group participants were described as having no problems. When the remaining unnamed children were counted ("No problem with the others.") a total of nine experimental group and five control group members were considered free of behavior problems. Overall, the Assistant Principal described more experimental group students as being better behaviorally or exhibiting no problems, and more control group students as being worse or having behavior problems.

The Assistant Principal at School B was not aware of any changes in the children. She did, however, describe three of the children Principal B had mentioned in his interview, explaining that one student (experimental group) was now in Special Education and another student (experimental group) went before the SBLC and would
be retained this year; this child’s parents believed he was dyslexic, but the school did not agree. In addition, the Assistant Principal described the Special Education resource student (control group) discussed by the Principal, and then described a child (control group) not mentioned by the Principal, who had just been referred for Special Education evaluation by the SBLC.

School C’s Assistant Principal discussed 9 of the school’s 20 participants by name. One experimental group student was described as having no problems, another (experimental group) as being better behaviorally, and another (control group) as improving behaviorally. Two experimental group students were described as having behavior problems, while three control group students were listed as having problems, and another control group student was described as being worse. As in the case of the Assistant Principal at School A, the Assistant Principal of School C described more experimental group than control group students as being better or exhibiting no problems, and more control group students as being worse or exhibiting problems.

When asked if she saw a difference in the two groups of children, the Assistant Principal at School C reported seeing no difference in the groups, as there were problems and immaturity in both groups, while her earlier responses actually reflected less problems in experimental group students. The Assistant Principal at School B saw no differences in the two groups, which was consistent with her reply to the first question. Also consistent with her responses to the initial question, the Assistant Principal of School A said if she had a choice of which students she would want in her class, she would pick one group over the other because she viewed them as being more
mature, having better grades, and presenting fewer discipline problems; the group she picked was the experimental group.

**First Grade Teachers.** Twelve first grade teachers who taught participants were also interviewed individually. They were first asked to describe the children's performance in reading and to describe how that performance had changed since the beginning of the year. The teacher at School A who allowed the use of her coat room had 12 of her students participating in the study, 8 experimental and 4 control group students. The teacher reported seeing a “distinctive difference” in five students, describing them as risk-takers who now attacked words and used their skills to read. Three of these students were in the experimental group and two were in the control group. She attributed this improvement to “exposure from all the realms—total immersion in reading—in my room and with the tutoring program.”

The second School A teacher had one control group and two experimental group students in her room. She reported seeing no difference in the control group student, and large, positive changes in the two experimental group children, one of whom was now on level, and the second was no longer failing. (“I wish you could tutor him in math, too,” she added.) This teacher attributed the change to her firmness in the classroom and the tutoring program.

The third School A teacher of the at-risk class, who was a first-year teacher, had six experimental group and eight control group students in her room. She reported that six of the children (one experimental group, five control group) had A’s in reading, two (experimental group) had B’s, one was average (experimental group) and five (two
experimental, three control) had F’s. She reported that five of her students had improved (two experimental, three control); she did not respond to why she believed they had changed. In summary, School A teachers believed slightly more experimental group students (seven) than control group students (five) had improved significantly and they attributed this change to both their teaching and the tutoring program.

The four participating teachers at School B were also asked to describe any changes in their students’ reading ability. A teacher of one experimental group and three control group students saw a “significant change” only in the experimental group student. She explained that she had spoken to this child’s parents at the beginning of the year regarding his going back to kindergarten. At the completion of the first semester, the child was making B’s in reading and sometimes missing no items on tests. The teacher attributed this change to “the extra push he’s been getting with the program you’re doing.”

The teacher of two experimental group students reported that while both students did not score as high on the Developmental Reading Assessment (DRA) at the beginning of the year as they should have, both students were now in her high group in reading. She attributed this to her class, home support, and the tutoring program. A third teacher at School B with two experimental and one control group students reported an improvement in one experimental group student, who was now more confident in “trying to figure out what words are.” She attributed his progress to the tutoring program and his placement in a Resource Room in December, and added that “small words, sight words, have let him know what some are—then he has confidence
to try to figure out others." The fourth School B teacher, who taught only one control group student, was unavailable for interview. In summary, School B teachers saw significant improvement in one control group and four experimental group students and attributed the changes to the tutoring program, their classroom instruction, and home support.

Four first grade teachers and one Resource Room teacher were interviewed at School C; one first grade teacher was on sick leave and could not be interviewed. The Resource Room teacher had begun serving one experimental group student during the study and saw an improvement in his reading, which she attributed to his placement in a small group in her room.

A second teacher, who taught two experimental group and five control group students, saw some improvement in the two experimental group students and two of the control participants. She pointed out that one of the experimental group students could not read "at" or "it," but now tried to read—loudly. She attributed this improvement to the combination of the one-on-one tutoring and small group instruction in her classroom. She attributed the progress of one control group student to being put on medication for ADHD, and the progress of a second control group student to assistance at home.

A third School C teacher had only one experimental group student in her room and reported that her grades were dropping in every subject. She attributed this negative change to no academic support at home. The fourth School C teacher had two experimental group and three control group students in her room. This teacher strongly
believed the tutoring program had had a significant impact on her two students. She explained:

It had a much more positive effect on them than on the controls. They both would have been borderline repeating at the beginning of the year based on the DRA. These two have made the greatest improvement in the whole class! They both had poor DRA scores, were on level, but weak, and had little home support. Now, both will pass first grade! They didn’t have help from home and they have done tremendously! Decorvin has an 84 in reading for the semester and DeMario has 87.

The teacher also discussed the control group students’ loving to go to their daily sessions, but she saw no effect on their reading, and one of the three control group students would repeat first grade. When asked to what she attributed the difference the teacher replied, “I do whole group reading, so my program is the same for all of them. So the difference was your program. Those two have made such strides. They love to go, are excited, and show everyone their words. They feel special.”

The last teacher at School C taught three experimental group students. She reported a “big improvement” in two of the students, and a “slight improvement” in the third. She attributed this to maturity, as all three students were very immature, and to the one-on-one tutoring. In summary, the interviewed teachers at School C saw a significant improvement in the reading ability of six experimental group and two control group students. They attributed this to factors such as the one-on-one tutoring, small group instruction, medication for ADHD, and maturity; one teacher, who did not use small group instruction in her classroom, gave total credit to the Edmark intervention.
In summary, first grade teachers of study participants saw a significant improvement in the reading ability of 17 experimental group students and 8 control group students. They attributed this improvement to such factors as the tutoring program, small group instruction in their classrooms, their teaching, home support, maturity, and medication for ADHD. One teacher who did not use small group instruction in her classroom gave total credit to the tutoring intervention.

Teachers at all three participating schools were next asked to describe any changes in the students' attitudes towards reading. The first teacher at School A saw a "marked improvement in positive attitude towards reading" for six experimental group and two control group students. She attributed this to the children's seeing the importance of reading because she worked on it and the America Reads tutors worked on it. The second School A teacher reported her two experimental group students now loved to read, but her control group student would not read the basal. The third teacher explained that one experimental group student and three control group students liked reading at the beginning of the year, but did not any longer. She attributed this to reading getting harder for them and they gave up. She also named two experimental group students who now enjoyed reading.

The first School B teacher believed her one experimental group student had the "biggest change in attitude. He is more willing to participate in class discussions. He wants to read out loud now." The second School B teacher related that her two experimental group students understood more, so they now enjoyed reading more. "As for change, in his reading group Thomas loves to read. Laura gets frustrated when
others are slower than her!” The third School B teacher reported one of her two
experimental group students had become more self-confident, which she attributed to
the tutoring giving him “things that he could accomplish, and using repetition.”

The Resource Room teacher at School C explained that her one experimental
group student had had a good attitude toward school and was eager to learn since he
entered her room during the second six weeks of school. The second School C teacher
explained that all her students enjoyed reading and especially loved it when she read to
them. “At the beginning of the year they were very excited to have books in the room,
and for me to be reading to them,” she said. The third teacher had seen no change in
her one experimental group student’s attitude towards reading. The fourth teacher
explained that all her students had good attitudes toward reading except one control
group student, who “wants to read, but can read one word, so his attitude changes
when I have to tell him every word. His attitude is worse, he’s much more frustrated.”

The fifth School C teacher expressed her perception of one experimental group
student’s attitude changing “immensely,” while a second had shown “a slight change
for the better.” She explained that the third experimental group student had a “no care
attitude. Justin barely knows what is going on.” She attributed the positive changes to
their becoming more proud of themselves for succeeding. In summary, teachers directly
named 17 experimental group students and two control group students whose attitudes
toward reading had improved, and two teachers maintained that all their students (with
the exception of one control group student) had positive attitudes towards reading. The
teachers attributed this to such factors as the one-on-one tutoring program, having the
importance of reading reinforced in both tutoring sessions and the classroom, and having obtained skills which made it possible for them to read.

Teachers at the three schools were then asked if their students’ attitudes toward school had changed. The first School A teacher reported all students except one experimental group student, DeMario, having positive attitudes towards school. The second School A teacher related a positive change for one experimental group student, whose grades had significantly increased. The third teacher told of a positive change in the attitudes of one experimental group and two control group students, which she attributed to their increased confidence when they received work on their instructional levels.

The first School B teacher expressed her one experimental group student’s change from “whining” and wanting to go home to wanting to be at school. The second School B teacher explained that both her experimental group students had always enjoyed school. The third teacher described a change in one experimental group student’s behavior, from crying to being more comfortable at school because of an increased confidence level.

The School C Resource teacher reported her one experimental group student always had a good attitude about school, while the second teacher reported the same student hated school and told his mother no one would play with him. This teacher said all her other students had positive attitudes towards school since the beginning: “They think it is better than being at home, because of the security and routine.” The third teacher believed her one experimental group student was willing to do, “but I can’t tell
you if she ever enjoys anything,” she said of the student whom the researcher had never seen smile. The fourth teacher saw a change for the worse in one of her control group student’s attitude, which she attributed to his lack of success. “School to him,” she said, “is failure.” The fifth School C teacher saw one experimental group student as “improving dramatically” in his attitude, and attributed it to his succeeding in his work.

In summary, the first grade teachers saw significant improvement in attitude toward school in five experimental group and two control group students; one control group student was reported as having a significantly worse attitude. Teachers attributed the positive changes in attitude to such factors as improved grades and increased self-confidence due to working on their instructional level; the worse attitude towards school of one control group child was attributed to his academic failure.

Teachers were finally questioned on changes in their students’ attitudes towards themselves. The first teacher at School A reported two experimental group students and one control group student as having the most improved attitudes towards self, which she attributed to their increased language development, which she in turn credited to having the opportunity to talk with adults. The second teacher said one experimental group student had improved the most and now would raise his hand to answer questions. The third School A teacher listed two experimental group students whose confidence had “gone way up.”

School B’s first teacher reported her one experimental group student as being more self-confident. She explained that this child still cannot cut with scissors or hold his pencil correctly, yet now he was making B’s in reading. She attributed his increased
self-confidence to the “boost” he received in the tutoring program. The second and third teachers did not report a significant improvement in attitude towards self, but reported good self-concept for all their students.

The Resource Teacher at School C did not address her student’s attitude towards self, and the second teacher did not report a significant improvement in this area. The third teacher, however, related that two control group students had lower self-esteem now, while her two experimental group students had higher self-esteem. She attributed the improvement to the tutoring program; in the case of one experimental group child, she said the tutoring was “the only one-on-one attention the poor child gets.” The fifth teacher said her experimental group students came into her room with “pretty good self-concepts.”

In summary, the first grade teachers mentioned eight experimental group students in whom they had noticed significantly improved attitudes towards self, and two control group students with lowered self-esteem. They attributed the positive changes to increased language development and the tutoring program; the decreased self-esteem was explained by academic failure.

**First Grade Students.** When asked if they liked to read and why or why not, all students except one experimental group participant answered “yes”; in the pre-intervention interviews one child answered no and one did not know. When Melvin answered, “Not that much. It’s because sometimes I just don’t feel like reading,” the researcher asked if it were hard for him. “Yes, ma’am.” “Has it gotten any easier?” “A little,” he responded.
The students replying in the affirmative again gave “cause it’s fun” more than any other answer. The next most common reply was again because it “helps you learn in school.” Passing to the next grade was again mentioned, and several students told of their parents wanting them to read. “So I can get an education” was heard once more, as was, “Because it’s the most important thing in the world.” One very eager student replied, “I just can’t wait to read. Because I love to look at books and I want to read them.”

When asked if they read books at home, the majority again answered yes. Instead of the most common reason why being their passing to second grade, the most frequently given reason had to do with parental involvement: “Because my momma want me to learn very good,” “My momma teach me how to read everything,” “Because I love to read to my momma and my momma love to hear me read,” and, “Cause my daddy tells me to read everyday to practice so I can read good.” Other responses focused on liking to read, wanting to pass to second grade and “get smart,” and having books in their homes to read. One very enthusiastic student did not confine his reading to home: “And at stores. Because every time I see words I like to try to read them. Sometimes I be looking for words around the house but I don’t find none.” One student shared this warm memory of reading: “When I was a little bitty baby my momma used to read me stories, and I would fall asleep.”

Ten students answered that they did not read at home; this was four fewer than during pre-intervention interviews. Once again, the reasons for not reading at home were primarily not having books (“I don’t got no books.”) or not being able to read.
("No, ma'am, I don't know how, but my brother's showing me.") Two students gave very honest replies: "Cause I don't want to," and "Cause I be playing and watching TV."

Students were then asked if they liked their reading class, and were additionally questioned on which they liked better, last year's reading class or this year's. When asked if they liked their reading class at school, only two students, one in the experimental group and one in the control group, answered no, explaining that "reading is hard." The students who answered yes again cited reading being fun the most often ("It's fun. The words tickle you.").

When further questioned as to whether they liked this year or last year's reading class the best, the majority chose this year, focusing on having more challenging work in first grade ("You don't learn in kindergarten," "Last year we did easy reading," "We didn't do reading in kindergarten. She didn't let us. We just had nap-time and work. First grade is better cause it makes you read hard words."). Four students, three control group and one experimental group, chose last year in kindergarten because of the snacks, easier work, toys, and good grades ("Cause I always be making 100 and S's."). Seven repeaters, three experimental group students and one control group student, chose last year's first grade class, primarily because they preferred the teacher ("Because I had Ms. Sabb and she didn't have a mean face.").

Seven students said they liked both years' reading classes equally.

Students were then asked if they liked the reading that they did with their tutor. Every participant except one answered yes to this question. Experimental group
student, Marcus, who displayed extreme motor hyperactivity and distractibility, replied, “No, cause she don’t give me nothing.” The most common reasons why were variations on “because it’s fun,” “because she’s nice,” and “it’s fun and she gave us stuff like stickers and pencils.” The following are sample responses from experimental group students:

“Because she lets me take a test and I pass it quick.”

“It’s really fun. We did words—we practiced on words and reading.”

“Because she teached me words and stuff. And I got to tell her stuff. I learned from her. I know every kind of stuff.”

“Cause she teach people to read.”

“Because it’s fun. And you’re learning.”

Several control group students mentioned the behavioral problems of which the volunteer tutors complained throughout the intervention: “I like the stories she’d be reading. Sometimes the peoples would just be disturbing it. I’d like to be a reader like her,” “Cause I heard her read but the people were being noisy but I still can hear her. But she was very nice,” and “I just like it. It was good reading. Sometimes other people be making her get headaches.” Other control group students made the following comments: “Cause it’s fun when people read to you and it helps you learn to read.” “It’s a bunch of kids—coming in with me and she be reading to us. I like what she reads.”

Students were finally asked if they liked school, why or why not, and what they liked the most and least. Only one experimental group student did not say he liked
school: “I don’t like it a lot, lot, lot. I want to be at home playing with my nephew and my dog.” Reasons for liking school were again because it is fun and because it is how you learn. One student summed it up this way, “We come to school to learn and eat and play outside.” Another common response was a variation of “cause it’s really fun and makes you smart. If you don’t come to school you can’t be smart.” One student, with less lofty motivations, said, “I don’t want to go home—I want to stay at school. It’s boring [at home]—my friends don’t come over and I have to do homework and stuff.”

What students liked best about school was a very diverse list, from projects to centers, from math to art. Reading, however, was cited by 10 students, 4 experimental group and 6 control group, as what they liked best about school. Other common responses were learning, eating, and playing on the playground. One child described the perfect first grade day: “Go to concession stand, go outside, and then go to eat in the lunchroom, and then go on the trip.” Others loved almost everything “the best”: “Reading, spelling, and math. Johnny Can Spell, pencils, and to play outside, and to be good.” Some of the same “favorites” (Johnny Can Spell and computer lab, for example), were also found on the “least favorite” lists. Many children listed homework and getting into trouble as their least favorite aspects of school, while one control group student listed reading. Responses ranged from “onions” and “broccoli” to “Fixing sentences. If they don’t sound right you have to fix the word.”

As in the pre-intervention interviews, violence emerged as a common theme in the children’s “least favorite” lists:
"I don’t like shooting, fire, and knives."

"Saying cuss words and hitting."

"Fighting and kicking."

"The only thing I don’t like is cussing out teachers, hitting teachers, talking back to teachers."

"Going to the principal and getting a spanking."

"Sometimes people gonna beat you up. Sometimes your mom not be home and you could get hurt."

Thirteen interviewed students mentioned some form of violence in their responses to their least favorite aspect of school.

In summary, all but one of the 60 participants responded that they liked to read; the most common reasons why were believing reading is fun, wanting to learn, and desiring to pass to second grade. The majority of students said they read at home, with many mentioning their parent(s) reading with them or wanting them to read. Those who reported not reading at home explained that they had no books or did not know how to read. Fifty-eight students said they enjoyed their reading class at school, and the majority preferred this year’s reading class to last year’s, citing more challenging work in first grade. Four students preferred kindergarten, while seven repeaters liked their last year’s first grade teachers better. One student reported not enjoying the time spent with his America Reads tutor, and only one participant reported not liking school. Ten students reported reading as their favorite thing about school, and 13 students described various forms of violence as their least favorite thing.
Parent/Guardian Interviews. The researcher attempted to contact the parent or guardian of each participant using telephone numbers that had been given to their children’s schools. Twenty-seven telephone numbers were either disconnected or answered by people who had never heard of the participants. This supported the teachers’ reports of not being able to contact the parents of many of their students; even the emergency telephone numbers given to the schools were disconnected or belonged to people who did not know the participants.

The 33 parents who were interviewed individually were asked the questions listed in Appendix B. Eight of the experimental group parents from School A who were interviewed reported an improvement in their children’s reading ability. “Yes, he seems to be better,” reported one grandmother, “he seems to have a little more interest in his work. I don’t have to fuss with him to get him to do it.” “I’m so proud of him,” said one mother, “I’m surprised—he read a whole page, fill-in-the-blanks.” Another grandmother said, “We’ve been reading a book from the library together today. I was going to read it to him but he read it to me.” “I noticed a big difference in it,” said another mother, “At first she had problems with a lot of words. Now, she’s reading straight through.” Finally, one experimental group mother answered, “Oh yes, he does a lot better. He tries to sound out his words. . . He had someone to show him how to do it. . . He has a real desire to read now. Last year, he didn’t read at all, and at the beginning of this year. Now, he reads the Bible with his father.”

Five of the seven control group parents reported an improvement in their children’s reading ability, and attributed it to their working with the children at home.
and to what the school was doing. One grandmother also mentioned the control group reading sessions: “Yes, he reads pretty good. Lots better. I read to him and y’alls reads to him, and I have a tutor for him in the afternoon.” Two control group guardians, one parent and one grandparent, reported no improvement: “Reading is the only low score he has. I think he’s dyslexic.” “He’s having a very rough time. There’s not enough time in the day for the teachers to devote to each child, and I don’t have enough time. I have six children and the youngest one is very sick.”

Five parents of experimental group students and three parents of control group students at School B were interviewed. When asked if they had seen any changes this school year in the reading ability of their children, all five of the experimental group parents answered that they had seen a change for the better. The parents attributed this to different things: one mother cited her son’s move to a Special Education resource room, while a second parent, a father, credited the improvement to his working with his son at home on memorization. Two parents mentioned the tutoring and their working with their children at home, while one parent gave total credit to the tutoring. Two of the three parents of control group students reported improvement in their children, which they attributed to the school’s efforts. A third control group parent reported no improvement.

Four of the seven experimental group parents at School C reported seeing improvements in their children, even if they were not yet earning passing grades. “She’s still making bad grades, but now she can read more words and sentences.” Another parent saw significant improvement:
Yes, a whole lot. You all working with him, being able to understand sentences. He doesn’t need my help now. I can see a great difference. At the beginning of the year he couldn’t read. I had to help him with every word. I really appreciate all your help.

These parents attributed the positive changes to the tutoring program and one mentioned the Johnny Can Spell program. Two experimental group parents reported no change (“I should have kept her in kindergarten. She don’t know nothing. She probably can’t hear. I need to get her hearing checked.”). One experimental group parent reported a change for the worse: “I’m going to make an eye doctor’s appointment for him. It might be because of his attitude towards the school. He thinks he’s always blamed for everything . . . It has nothing to do with the tutoring.” Two of the control group parents reported improvements; one attributed it to the tutoring and one said, “I assume it’s because she’s doing her lessons, paying attention, taking more time.” One control group mother said, “He hasn’t gotten worse. I think he needs more improvement.”

In summary, 17 of the 20 interviewed experimental group parents/guardians perceived improvements in their children’s reading ability which they attributed to such factors as the tutoring program, the school, and their working with their children at home. Nine of the 13 control group parents/guardians interviewed also saw positive changes, which they attributed to such factors as their working with their children and the programs at school.

Parents of participants were next asked if their children’s attitudes towards reading had changed. All eight experimental group parents at School A reported improved attitudes. One grandmother thoughtfully responded, “He seems to enjoy
reading more. When he feels like he’s accomplishing something, he feels better. If a lot
of kids could get more attention, they’d do better, feel better about themselves—none
of them want to do badly.” “When he reads real good we’re so happy and he sees it,”
reported another grandmother, “that makes him happy.” One mother said, “It has really
improved. He used to say ‘It’s too hard.’ Now when I sit down with him he does so
good.” Six of the seven control group parents also saw an improvement and attributed
it to reading class in school. One mother reported her child wanted to read, but could
not: “He gets aggravated because he wants to, but can’t.”

The five experimental group parents at School B also saw positive changes in
their children’s attitudes towards reading. “Before, he wouldn’t try. Now, he tries to
sound out words,” said one mother. “She likes it better, she doesn’t get as frustrated,”
reported another. One of the three control group parents discussed an improvement in
attitude, while a second reported her child always having a pretty good attitude, and
the third reported no change.

Four out of the seven experimental group parents at School C reported a
positive change in attitude about school. Said one mom, “She seems to enjoy reading
more and I don’t have to ask her to read. She will bring books to me to read. I think
it’s because of the tutoring. She talks about it all the time.” “He doesn’t really like to
read,” said another mother, “but he’s gained a little confidence. He’s a little more
eager, can sound out words better.” “He likes to read more. Before it was not knowing
words. Now, he’s bringing library books home and says, ‘let’s read!’ He asks me to
buy him books,” reported another mother. The comments of the three parents not
reporting an improvement included, "He doesn’t like to sit still to read," and, "When she reads a book she says, ‘Momma, I don’t know this word.’ I have to read it first and she reads behind me." None of the three control group parents reported positive changes: "I think he’s sometimes scared. He says, ‘I can’t.’" "She don’t like to read. She’ll look at something and say she can’t; she won’t try." In summary, 17 of the 20 experimental group parents/guardians interviewed described improvements in the participants’ attitudes toward reading, while 7 of the 13 control group parents saw better attitudes. The majority of parents attributed this to the students being better able to read, and several cited increased confidence.

Parents were then questioned concerning changes in their children’s attitudes toward school. Five of the eight experimental group parents reported seeing positive changes: "When they can manage and do well they enjoy going. I definitely think your program is a benefit," said one grandmother. One mother attributed the change to her child’s teachers: "Yes, he’s done better with his attitude. I think it’s because of certain teachers that talk to him in a nice way." Another mother said, "She likes school, has always enjoyed going, but being able to read and understand makes it better for her." Two mothers saw no change in their children’s attitudes, which had always been positive, and one reported that her daughter “tends not to want to go—her behavior is getting kind of bad.” When questioned why this was, the mother did not know.

Four of the seven control group parents reported improvements in their children’s attitudes towards school. One mother attributed this to their “doing more in first grade than in kindergarten,” and another reported problems last year with other
children and her teacher. Three parents reported no change, but maintained that their
children liked school. The mother of six children who had expressed her frustration at
not having enough time to work with her son said, "He loves school. He's the first one
up and dressed. He doesn't realize he has a problem in reading."

Only one of the five experimental group parents at School B cited an
improvement in attitude towards school ("He seems to enjoy it a little more now than
last year in kindergarten. He likes the tutoring you are doing. He has said things about
it."). Three of the parents maintained that their children had always had positive
attitudes towards school, and one parent said she "couldn't say."

None of the seven experimental group parents at School C reported a change in
their children's attitudes toward school. Instead, six reported their children had always
liked school ("He likes school, he always has. He asks every day if it is a school day.")
while one mother reported a negative attitude toward school and said she was
considering a change of schools. (This mother had also reported the "change for the
worse" in her son's reading ability. It should be noted that this parent had moved her
children to several schools in the parish and had been arrested during the time of the
intervention for threatening school officials.)

One of the control group parents at School C related that her daughter "sort of"
liked school, while another said her daughter did not like it: "She's not catching on like
she's suppose to. She won't get a sticker when everyone else does and then she'll cry."
A third mother said, "At times he doesn't want to go. We're going through a divorce
and it's effecting him and his brothers."

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In summary, 6 of the 20 interviewed experimental group parents saw positive improvements in their children's attitudes towards school, while 12 reported continuing positive attitudes, 1 reported a continuing negative attitude, and 1 "could not say." Of the 13 control group parents, 3 saw a change for the better, while 8 saw continuing positive attitudes toward school and 2 saw continuing negative attitudes.

Parents were finally asked if they had seen a change in their children's attitudes towards themselves. Five of the eight experimental group parents reported positive changes in self-concept. One mother said, "Yes. She really feels good about herself by being able to read." Another mother added, "Yes. All that works together. He feels better about himself definitely because he can do better. I really appreciate what you did." Three experimental group parents saw no change; one frustrated grandmother said, "He is having a problem here at home—his dad is working two jobs now—his mother doesn't take up any time with him. I need help with this child. I can't do it all myself." (The teacher of this student had told the researcher that Marcus' mother was 11 years old when she gave birth to him.)

Six of the seven control group parents reported seeing improvement in their children's attitude toward self. "She feels a lot better about herself now that she reads better and stays on the honor roll," said one mother. "Yes, a little improvement," added another parent, "I can't say why—more competing and more confident because her grades are up there maybe. She likes to compete. I'm glad she's in your program."

Three of the five experimental group parents at School B perceived an improvement in their children's attitudes towards self, while two saw no changes. One
control group parent saw a positive change, while two said their children’s attitudes had remained the same.

At School C, three experimental group parents saw an improvement in their children’s attitudes towards self. “It’s gotten better,” said one mother, “I think because of the encouragement from the teachers and us at home.” the second mother reported, “He’s matured a lot. He loves to say, ‘I’m getting good at this!’” The third mother said, “He’s more confident—now that he can read and understand words. I’ve seen his confidence increase a lot. It built him up. He’s more sure of himself.” The remaining four experimental group parents had noticed no change in attitude. Only one of the control group parents reported her child’s attitude toward self as being “a little better”; the other two control group parents noticed no change.

In summary, 11 out of 20 experimental group parents/guardians reported seeing a change in their children’s attitudes towards themselves, while 8 out of 13 control group parents reported such a change in attitude. The remaining parents saw no change, while the majority reported good attitudes towards self all along.

Review of Documents

In order to better triangulate interview data, the researcher examined first semester report cards for all 60 participants. These report cards contained the students’ grades in all subject areas for the first three six-week periods, as well as their semester averages in each subject. A review of the report cards for the 30 participants at School A revealed that 10 of the 16 experimental group students were passing reading with semester averages of D or better, while 13 of the 14 control group students were
passing reading. Of the six experimental group students who were failing reading, two had F's for first semester grades in all subject areas. Four of the experimental group students were on the school's Honor Roll for all three semesters; four control group students were also on the Honor Roll for all three semesters, and one additional control group student earned Honor Roll status for the second and third semesters. Placement on the Honor Roll in the participating parish required an overall grade point average of 3.0 or above and no grades of "Unsatisfactory" in ungraded subjects such as art, music, and PE. The Honor Rolls for each school were regularly submitted by the administration of each school and printed in the local newspaper.

School B report cards revealed that four of the five experimental group students were passing reading. The one student with an "F" in reading had an "F" semester average in all subject areas. Three of the five control group students were passing reading with a "C" or above. Two of the experimental group students had attained the Honor Roll for all three semesters and a third student was on the Honor Roll for the second and third semesters. One control group student made Honor Roll all three semesters, and a second earned Honor Roll status the first and second semesters.

The most significant difference in the reading grades of experimental and control group students was found at School C. Here, 6 of the 10 experimental group students were passing reading with a D semester average or above, while only 1 student out of the 10 control group participants was passing reading with a D. Only one experimental group student earned Honor Roll status for the second and third semesters; no control group students had attained the Honor Roll that school year. It
was also noted that the average reading grades at School C, which had the highest poverty level of the three participating schools, were significantly lower than those at the other two schools.

In summary, 20 experimental group students out of 31 were passing reading, while 17 out of 29 control group students were passing reading at the end of the first semester. Eight experimental group students had attained Honor Roll status, as had seven control group participants. When the numerical semester reading averages for each group were calculated, the experimental group had a slightly higher mean reading score (78.5) than the control group students (72.9). Such comparisons do not take into account any initial differences between the two groups, and are presented only as supporting documentation for the other data collected in the study.

Summary of Analysis of Qualitative Data

Results for Research Question 1

Research Question 1 asked the following: Will a pattern of responses concerning the reading performance of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester? Pre-intervention interviews with students' 1998-1999 school year teachers revealed a majority of students who entered first grade weak in reading and who had attained the minimum skills required for promotion. Interviews with school principals and assistant
principals revealed expectations that study participants would make D's and F's in reading on their report cards.

None of the three principals and three assistant principals interviewed at the conclusion of the study were aware of any differences in the reading ability of participating students. Two principals and two assistant principals were aware of several students being brought before the School Building Level Committees (SBLC) at their respective schools for consideration of referral for Special Education evaluation, but none of the administrators were aware that some of these at-risk students (15 in all, or 25% of participants) had been on their schools' Honor Rolls.

The first grade teachers of participating students did, however, describe significant improvements in the reading ability of 17 experimental group students and 8 control group students. The teachers attributed these gains to such factors as the tutoring program, small group instruction, their teaching, home support, maturity, and medication for ADHD. Seventeen of 20 experimental group parents interviewed also perceived improvements in their children's reading ability, as did 9 of the 13 control group parents interviewed. Parents attributed these improvements to the tutoring program, what the schools were doing, and their working with their children at home.

Teachers and parents both described approximately twice as many experimental group students as control group students exhibiting significant improvements in their reading ability. While a review of report cards and Honor Roll status revealed an almost equal number of experimental and control group children who were passing reading and had met Honor Roll requirements, 1998-1999 report cards were not
examined to determine improvement, since kindergarten report cards do not give letter grades, but rather, ratings of Satisfactory, Unsatisfactory, and Needs Improvement; the report cards, therefore, could not be used to support or contradict improvement in reading ability from the kindergarten year. A pattern of responses did emerge from teacher and parent interviews, however, which suggested a number of experimental and control group students had improved significantly in reading ability. In addition, approximately twice as many significantly improved students were in the experimental group as compared to the control group.

Results for Research Question 2

Research Question 2 asked the following: Will a pattern of responses concerning the attitudes toward reading of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester? Interviews with participants revealed almost every student had a positive attitude toward reading both before and after the study. Pre-intervention interviews revealed 58 out of 60 participants liked to read; the most common reasons why were the belief that reading is fun, and it helps you learn and pass to second grade. Fifty-nine students described positive attitudes towards reading in their post-intervention interviews. All 60 students responded that they enjoyed their reading class in the pre-intervention interviews; 58
still enjoyed their reading class at the end of the first semester. Only one student reported not enjoying time spent with the study tutors.

First grade teachers revealed that 17 experimental group students and 2 control group students had improved attitudes in reading since implementation of the intervention. They attributed these positive changes to the tutoring program, having the importance of reading reinforced in both tutoring and their classrooms, and the students' having obtained skills which made it possible for them to read. Parents/guardians also reported improved attitudes toward reading: 17 experimental group parents related positive changes, as did 7 control group parents. Parents and guardians attributed the improved attitudes to their children being able to read better, and thus enjoying it more.

The interview data thus indicated students self-reported positive attitudes towards reading from the beginning of the school year, while teachers and parents perceived significantly improved attitudes for many students. Both parents and teachers reported more experimental group children than control group children as exhibiting improved attitudes towards reading.

Results for Research Question 3

Research Question 3 asked the following: Will a pattern of responses concerning the attitudes toward school of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the Edmark Reading Program and for those who do not receive
supplemental instruction in the Edmark Reading Program for one semester? All 60 participants reported they liked school at the beginning of the school year; at the completion of the semester all but one student again verified enjoyment of school. While recess was the most-cited favorite aspect of school, reading and learning were the second and third most mentioned favorites.

The first grade teachers who were interviewed saw significant improvement in attitude toward school in five experimental group and two control group students; one control group student was reported as having a significantly worse attitude. The teachers attributed the improved attitudes to such factors as improved grades and increased self-confidence. The one worse attitude was attributed to the control group child’s academic failure. Parents described more positive changes in students than the teachers; 6 of the 20 interviewed experimental group parents saw positive improvements in their children’s attitudes toward school, as did 3 of the 13 interviewed control group parents.

While the principals of Schools A and B believed the majority of participants were frustrated by school and did not enjoy it, the principal of School C confirmed that the participants were excited about learning. Data from interviews with participants and key informants thus supported the conclusion that several participating students exhibited significant improvement in their attitudes toward school, and the number of experimental group children reported as improving was greater than the number of control group students.
Results for Research Question 4

Research Question 4 asked the following: Will a pattern of responses concerning the attitudes toward self of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for students who receive supplemental instruction in the Edmark Reading Program and for those who do not receive supplemental instruction in the Edmark Reading Program for one semester? The interviewed first grade teachers mentioned eight experimental group students in whom they had noticed improved attitudes towards self, and two control group students with lowered self-esteem. The teachers attributed the positive changes to increased language development and the tutoring program, while the decreased self-esteem was explained by academic failure.

Eleven of the 20 interviewed experimental group parents/guardians reported seeing a positive change in their children's attitudes toward themselves, as did 8 of the 13 interviewed control group parents. Parents attributed these positive changes to such factors as increased self-confidence due to being able to read better and achieving Honor Roll status. Once again, interview data supported the conclusion that several participants exhibited significantly improved attitudes toward self, and the number of experimental group students was again greater than the number of control group students. The review of documents further supported this conclusion, as 15 students identified as being at-risk for reading failure by their teachers and principals at the
beginning of the school year had achieved Honor Roll status by the end of the first semester.
CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to investigate the effects of using an economically feasible sight-word training program as a supplementary intervention with first grade students at-risk for reading failure. Sixty-two (62) first graders from three public elementary schools with high poverty rates who were determined by their teachers and principals to be functioning in the bottom 20-30% of first grade reading students were purposefully selected. Students were pretested on three subtests of the Woodcock Reading Mastery Test-Revised (WRMT-R), Form G: Letter Identification, Word Identification, and Word Attack. Participants were randomly assigned to either a control or experimental group. Experimental group students received 15 minutes per day of tutoring by America Reads Volunteers in the Edmark Reading Program, a highly structured sight word program. In order to partially control for the Hawthorne Effect, control group students were read aloud to for 15 minutes each day by the same volunteers. At the completion of the first semester of the school year, the 60 remaining participants were tested on four subtests of the WRMT-R, Form H (Letter Identification, Word Identification, Word Attack, and Passage Comprehension) and were asked to read aloud the 150 words taught in the treatment program. Qualitative data were also collected in the form of student, parent, teacher, and administrator
interviews, observation, and examination of documents. Quantitative data were analyzed with four ANCOVAs and one ANOVA using the General Linear Model; stepwise multiple regression was used to determine covariates for each subtest. Qualitative data were examined using content analysis. Results indicated a significant difference in the performance of experimental group students on both the Passage Comprehension Subtest of the WRMT-R and Edmark posttest. Qualitative data indicated that more experimental group students than control group students exhibited significantly improved reading ability, attitudes toward reading, attitudes toward school, and attitudes toward self.

**Discussion and Conclusions**

The intervention applied in the study was based upon the consensus in the literature that reading disabled students require explicit, direct instruction that is intensive, focused, and not of brief duration (Swanson, 1999). The models of direct instruction (Becker, 1977; Joyce & Weil, 1996) and mastery learning (Carroll, 1971; Bloom, 1971b, 1977b, 1979, 1986, 1988) formed the theoretical framework for the study. The use of the Edmark Reading Program allowed maximization of the students’ time on task, as each student received only 15 minutes per day of one-on-one tutoring. The program’s errorless discrimination method followed direct instruction’s key principal of shaping behavior, as students experienced immediate success when told to point to each new word when it was presented in isolation. Students then pointed to words surrounded by non-word groups of letters, then selected them from among two distracter words, followed by reading them in isolation, in sentences, and finally in
stories (see Appendix A for a complete description of program components). Consistent with the principles of mastery learning, students worked at their own pace in the program; 44 students were still working in Level 1 at the end of the program, while 16 had begun Level II. All students took brief diagnostic tests after the presentation of every 10 words, and participants received immediate feedback after each response and each test.

Bloom (1971a, 1977a) viewed one of the important effects of mastery learning as its positive outcome on students’ self-concepts. He believed that children’s feelings of inadequacy in school, corroborated by failing grades, would result in negative views of school and learning itself, and ultimately, to negative self-concept. The qualitative data gathered in this study supported Bloom’s contention. Interviews with the students’ first grade teachers revealed a group of children who were, overall, weak in reading skills, many of whom had been passed to first grade meeting only minimal skill requirements and requiring retesting on unit reading tests, and 16 students had repeated kindergarten or were repeating the first grade.

Post-intervention interviews of the students’ first grade teachers and parents/guardians revealed significant improvements in reading ability for more experimental group students (17 according to both teachers and parents) and control group students (8 according to teachers, 9 according to parents). Examination of documents revealed 20 experimental group and 17 control group students were passing reading, and 8 experimental group and 7 control group students had attained Honor Roll status. Teachers and parents/guardians also described students who showed
significantly improved attitudes towards reading and school, as well as enhanced self-concepts, and as with reading ability, more experimental than control group students were named. Also consistent with Bloom's ideas, parents/guardians and teachers attributed negative attitudes towards reading, school, and even self to academic failure.

An encouraging result of the qualitative data analysis was that almost all of the first grade students interviewed reported liking reading, their reading classes, and school in general. The fact that participants gave very similar responses in September and again in January supported the validity of their answers, although it is possible that some students gave the responses they believed the researcher would want to hear. The fact that most teachers and parents/guardians reported a majority of positive attitudes, however, supports accepting the students' responses as being their honest feelings. Such overwhelmingly positive attitudes on the part of these at-risk first graders supported the call in the literature for early intervention (Aaron, 1997; Spear-Swerling & Sternberg, 1994; Uhry & Shepherd, 1997). The current study suggests that early intervention with at-risk students should be undertaken not only to prevent academic failure, but also to prevent the deterioration of their attitudes towards reading, reading class, school, and perhaps most importantly, themselves, which can result from continued academic failure. Despite the majority of these children's low socioeconomic status (SES) and academic standing in the bottom 20 to 30% of their grade level, they still began first grade eager to learn and wanting to become successful readers.

It should be noted that two of the three principals and two of the three assistant principals interviewed did not believe these students enjoyed school, primarily due to
their frustration with academic tasks and not understanding the purpose of school, while having to deal with poverty-related issues, such as where they would sleep that night. To the contrary, the majority of students described coming to school to learn, to become smart, to learn how to read, and to be able to pass to the next grade. Because the theory of self-fulfilling prophecy is so powerful, it is important that administrators not make assumptions about students’ attitudes. It was also noted that none of the principals or assistant principals knew that participating students at their schools had achieved Honor Roll status. While it is no doubt impossible for administrators to have personal knowledge of all students in their schools, their ignorance of the students’ progress perhaps allowed their stereotypical expectations of the initially lowest-performing students to continue.

Another disturbing outcome of the student interviews was the fact that most of the participating children were not allowed to bring home either their basal readers or the books they checked out of their school libraries; the truth of these statements were verified by teachers at the participating schools. The majority of participants who answered that they did not read at home primarily explained they had no books at their houses. In support of this, one of the first grade teachers at School C explained in her interview that all her students enjoyed reading and especially loved it when she read to them. “At the beginning of the year they were very excited to have books in the room and for me to be reading to them,” she said. The study thus indicated the need for reading materials on the students’ instructional level to be sent to the children’s homes if they were to be expected to practice their emerging reading skills with parents, as
well as the need to encourage reading to their children by the school libraries lending parents appropriate books.

The review of literature in this study revealed widespread disagreement over the definition, etiology, and predictive correlates of learning disabilities in reading. This lack of consensus was also reflected in the variety of treatment models discussed in the literature. Many reviewed studies reported statistically significant improvements, but authors questioned the efficacy of the programs in light of the intensity, duration, and cost of the treatments. Even the well-known and frequently replicated one-on-one intervention, Reading Recovery, was not successful with 10 to 30% of children, despite its significant cost. The majority of reviewed research did appear to agree on three issues: (a) that reading disabled children require explicit, direct instruction that is intensive, focused, and not of brief duration, (b) that early identification and intervention could possibly prevent reading failure, and (c) that more research was needed in this area.

This study also collected data which gave further support to certain views expressed in the reviewed literature, and attempted to determine the effectiveness of a structured one-on-one tutoring program which had only been studied in its use with mentally retarded children. First, the focus of the present study was placed on teaching word recognition because it is a precursor to reading comprehension (Aaron, 1997; Ehri & Saltmarsh, 1995). Levy et al. (1997) described some agreement in the literature that improving word recognition and reading fluency leads to increased comprehension. Torgesen et al. (1997) cited one advantage of preventive programs for at-risk children...
as the students possibly not requiring unusually explicit instruction in reading comprehension if normal development of their word-reading abilities can be fostered. The results of this study supported these contentions, as the treatment (*Edmark Reading Program*) was designed to teach a 150-word sight vocabulary and did not directly teach comprehension skills. Univariate analysis of covariance (ANCOVA), however, revealed a statistically significant difference between the standard scores of experimental and control group children on the Passage Comprehension subtest of the WRMT-R in favor of experimental group students. In addition, calculation of Cohen’s $d$ yielded an effect size of .49 for Passage Comprehension, which represents a moderate level of effectiveness. These results provide powerful support for the importance of developing a sight word vocabulary in at-risk students and suggests that students’ poor performance on tests of reading comprehension may sometimes result from not being able to read the test items, rather than not possessing needed comprehension skills.

A one-year intervention with first graders in two low SES schools used a rebus-based approach to teach a 150-word reading vocabulary (Biemiller & Siegel, 1997). While the study resulted in significant differences in word identification in favor of the *Bridge* program participants, no significant effects were found for decoding or reading comprehension. The fact that the *Edmark Reading Program* resulted in significant differences in reading comprehension may suggest that its more direct approach to teaching sight words was more effective than the *Bridge* program’s icon-based method.

Such an assumption found support in Walsh and Lamberts’ (1979) research comparing the *Edmark* program’s errorless discrimination technique to a picture-fading
approach with Trainable Mentally Retarded (TMR) students. Their study discovered the superiority of the errorless discrimination approach for mentally retarded children. Since the current study demonstrates the effectiveness of the Edmark program with at-risk first graders, and past research had demonstrated Edmark's superiority to picture-fading techniques with children with mental retardation, it is logical that the Edmark intervention would have been more effective than the Bridge program's rebus-based method.

At the same time it must be noted that while the treatment in this study resulted in an extremely large difference between experimental and control groups on word recognition as measured by performance on the Edmark Level I posttest (which consisted of reading aloud the 150 words taught in the program), there was not a statistically significant difference between the two groups on word recognition as measured by the Word Identification subtest of the Woodcock Reading Mastery Test—Revised (WRMT-R). In order to examine possible explanations for these results, the words tested by the WRMT-R Word Identification subtest were examined. The researcher first determined the highest level word successfully identified by any participant, which was the 61st word on the subtest. These 61 words were then compared to the 150 words taught in Level 1 of the Edmark Reading Program. This analysis revealed that only 16 of the WRMT-R Word Identification words read by participants had been taught in the Edmark program. It should be noted that not all 60 participants reached the 150th word in the Edmark program; 44 students had not
completed all lessons by the posttest, with the student completing the fewest lessons ending the program on Word 60.

According to the Ginn Lexicon (Johnson, Moe, & Baymann, 1983), all 16 words which were taught in Level I of Edmark and were tested within the first 61 words of the WRMT-R Word Identification subtest were first grade words. At the same time, out of the 61 Word Identification subtests words read by participants, 39 words were on first grade level, 7 words were on second grade level, 7 words were on third grade level, 5 words were on fourth grade level, and 2 words were on fifth grade level according to the Ginn Lexicon; one word ("exit") was not contained in the lexicon. Another possible explanation of the non-significant differences between experimental and control group students on the Word Identification subtest of the WRMT-R, therefore, could be the fact that 21 of the 61 words presented ranged from second to fifth grade level. This would indicate that the words were above the grade level at which the students were instructed either in their classroom or the tutoring program, and were therefore equally unfamiliar to both groups.

The Passage Comprehension subtest of the WRMT-R was also examined to determine the highest sentence successfully read by a participant. All words in sentences 1 through 25 were then compared to the 150 Level I Edmark words. Such a comparison revealed an overlap of 44 words. This fact suggests the possible explanation that the treatment program gave students enough of a sight word vocabulary to be able to read and understand the Passage Comprehension items. Another possible explanation came from Biemiller and Siegel’s (1997) conclusion that
first graders who had received their treatment had superior word identification skills in grade two. The authors attributed this to the acquisition of a larger sight word vocabulary in first grade, which helped children profit more from their regular classroom instruction in second grade. It is possible that if Biemiller and Siegel are correct, the experimental group students in the current study might exhibit greater gains in word identification in the future, after their increased sight word vocabularies (as evidenced by the Edmark posttest scores) have allowed them to benefit more than control group students from their regular first and second grade classroom instruction in reading.

The experimental group students’ significant superiority on the Passage Comprehension subtest may also support the rich-get-richer, poor-get-poorer phenomenon of the Matthew Effect (Stanovich, 1986). This term describes good readers becoming more and more motivated to read, getting more practice reading, being expected to achieve more, and acquiring additional cognitive skills through the process of frequent reading (Spear-Swerling & Sternberg, 1994). It is possible that experimental group students experienced some of this effect, as their sight word vocabularies and exposure to text increased. This increased reading vocabulary and the enhanced motivation, encouragement, and practice provided by the program tutors may well have resulted in their acquiring the skills needed for passage comprehension in their classrooms.

It is also interesting to note that other reviewed articles have shown greater difference in WRMT-R Passage Comprehension subtest scores between their
experimental and control groups than in WRMT-R Word Identification scores. In a study that compared the use of Reading Recovery and Success for All in comparable first grade classes for one school year, Ross, Smith, Casey and Slavin (1995) computed effect sizes using Reading Recovery as the experimental treatment and Success for All as the control group. The Word Identification, Word Attack, and Passage Comprehension subtests of the WRMT-R were administered to both groups. Data analysis of students who received tutoring in the programs revealed an effect size in favor of Reading Recovery of .25 for the Word Identification subtest, and an effect size, also in favor of Reading Recovery, of .90 on the Passage Comprehension subtest. When Slavin, Madden, Dolan, and Wasik (1996) compared Success for All first grade students to control group students receiving regular class instruction, they analyzed test data for the lowest 25% of participating students. Again, the effect size of .86 on the Passage Comprehension subtest of the WRMT-R was slightly larger than that for the Word Identification subtest, which was .80.

In their study of the efficacy of the Dyslexia Training Program (DTP), Oakland et al. (1998) reported their experimental group students reaching average levels in ability to decode nonsense words and comprehend what they read, but maintaining their below average levels in word recognition. Swanson (1999) has pointed out that experimental group students can often score well when outcome measures are highly similar to treatment activities. He cited studies whose treatments included phonics instruction, for example, who only posttested participants on performance on pseudowords or phonics measures. Swanson maintained that the most valid test of
those children's reading ability would have been to read a test of real-word recognition. He gave the further example of testing metacognitive training interventions by testing real comprehension of text, rather than responding to a metacognitive questionnaire.

The present study would have been guilty of such confounding of treatment effect if the only dependent measure used had been the Edmark posttest, which asked students to read aloud the 150 words taught in the treatment. To avoid this, four subtests of the WRMT-R were included as more objective measures of reading ability. The Letter Identification, Word Identification, and Word Attack subtests were chosen as pretest measures because much reviewed research described the use of measures of letter and word knowledge, along with tests of phonological awareness, as strong indicators of reading disabilities in kindergarten and first grade students. No changes were anticipated in the Letter Identification and Word Attack subtests, as the treatment program did not address those skills. Deficits in phonological awareness have proven to be especially accurate predictors of reading problems. (Lyon, 1996). In the current study, for example, only 4 out of the 60 participating children had WRMT-R Word Attack standard scores above 90 at pretest.

The qualitative data collected in the study revealed that while there was a significant difference between the experimental and control groups on the WRMT-R Passage Comprehension subtest in favor of the experimental group students, several experimental group participants still could not identify all alphabet letters at posttest. In addition, the two groups had almost identical mean scores on the Word Attack subtest at posttest; again, this was expected, as the Edmark program taught only sight words.
and did not in any way address word attack skills. The lack of any difference in the two groups in Word Attack skills lends support to the conclusion that experimental group students were not able to decode the words in the Passage Comprehension sentences any better than control group students, but had the advantage of a larger sight word vocabulary, as evidenced by the *Edmark* posttest scores.

Even the most effective tutoring programs described in the literature, such as Reading Recovery, have the disadvantage of one-on-one instruction, extensive training requirements, and cost (Rankhorn et al., 1998). The current study demonstrated the feasibility of utilizing non-teacher volunteers who required only a minimal amount of training due to the highly structured nature of the program used. The America Reads volunteers were initially trained by the researcher for two hours; the researcher then followed the tutors to their first day of sessions to model instructional techniques and give feedback on the tutors' performance. After that, the researcher observed each tutor and her students on a weekly basis; a brief checklist was completed periodically to assure fidelity of program administration. This brief amount of training stands in contrast to the extensive training that master's level teachers undergo to become Reading Recovery tutors. The difference in training requirements appears to be directly related to the complexity of material to be taught in the tutoring sessions. Reading Recovery tutors, for example, are teaching the full spectrum of reading skills, from phoneme awareness to metacognitive strategies, and are required to constantly adjust program components based upon each student's performance.
Obviously, one-on-one tutoring by such highly trained master teachers as Reading Recovery uses is extremely effective. Not all one-on-one tutoring programs reported in the literature are efficacious, however. In an attempt to address the substantial cost of one-on-one tutoring programs, Vadasy et al. (1997b) explored the feasibility of using parents, grandparents, college and high school students to tutor at-risk first graders. The authors attributed the disappointing results (significant differences on only one nonword and one spelling measure) to their tutors not possessing the pedagogical and content knowledge necessary to effectively tutor students on letter sounds, rhyming, auditory blending, segmenting, spelling and analogy use, story reading, and writing. Other one-on-one tutoring interventions described in the review of literature varied significantly in the statistical significance of their results, indicating that one-on-one tutoring in reading is not, in itself, enough to insure significant improvement in at-risk readers. The results of the current study lent further support to this conclusion, as interview data revealed the crucial role played by classroom teachers and those parents who worked at home with their children on reading. The study also supported the importance of appropriately matching the skill level of the tutors with the complexity and skill requirements of the program to be implemented. The Edmark Reading Program manual described the only requirements for successful implementation as the ability to speak (or sign) and read the English language, the devotion of one or two hours to become familiar with program components, and a positive, encouraging attitude toward the students combined with the patience to work slowly and consistently. The current study indicated that America
Reads volunteers who were education majors, but not certified teachers, could successfully implement the *Edmark* program with at-risk first grade students.

The second common criticism of one-on-one tutoring programs is their cost, which often puts them out of reach for less affluent school systems, such as the rural north Louisiana parish participating in this study. Popham (1993) explains that the worth of an educational program cannot be ascertained by effects alone; rather, cost is another vital ingredient that must be taken into account. According to Shanahan and Barr (1995), implementation of Reading Recovery necessitates an approximate annual per pupil expenditure of between $4,000 and $4,625. The first year of school-wide implementation of Slavin’s Success for All program costs approximately $62,000 for a 500-student school; the cost decreases in subsequent years. The one-on-one tutoring program described in the current study had no personnel costs, as America Reads volunteers are paid by federal and state funds distributed by their colleges’ financial aid offices. Two of the *Edmark* kits used in the study were rented and one was borrowed; had three kits been purchased, the per pupil expenditure for serving 31 experimental group students at three different schools would have been $46 per student. After initial purchase of the kits, which are nonconsumable, only response booklets must be purchased, at a per pupil cost of $2.19 to complete Level I of the program, and an additional $2.19 for the response booklet for Level II, bringing the maximum annual per pupil expenditure to $4.38.

It is speculated that even the poorest school system performing a cost-feasibility analysis would conclude that implementation of the program discussed in this study...
would be affordable at an annual per pupil expenditure, after initial purchase of the program kit, of $4.38. After feasibility is determined, however, cost-effectiveness must be determined by analyzing a program’s costs and its effects in producing a desired outcome (Popham, 1993). Because many educational research articles are computing effect sizes for their treatments, programs with the same goals (increased reading achievement) can be compared on common indices of effectiveness. In a meta-analysis of 65 one-on-one tutoring programs, Cohen et al. (1982) calculated effect sizes for student achievement. In 45 of the 52 studies which measured achievement, the examination performance of tutored students was better than that of non-tutored students, with an average effect size of .40.

In a comprehensive review of literature, Wasik and Slavin (1993) compiled existing research on the effectiveness of five of the major one-on-one tutoring programs designed to prevent reading failure in at-risk first graders. Three of the reviewed programs, Reading Recovery, Success for All, and Prevention of Learning Disabilities used certified teachers as tutors, while the Wallach Tutoring Program and Programmed Tutorial Reading utilized paraprofessionals for program implementation. All the reviewed programs except Success for All tutored first graders for 30 minutes per day; Success for All sessions were 20 minutes per day, and Programmed Tutorial Reading had 15 and 30 minutes sessions. The effect size for first year evaluations of Reading Recovery were -.13 for a word test and .72 for a text reading measure. An Ohio statewide study of Reading Recovery listed an effect size of .49 on the Woodcock. The effect size for Success for All on the lowest 25% of first graders in
two participating schools was 1.01 for all reading measures at one site and .55 for a second site. Woodcock Letter and Word Identification effect sizes were .42 at the first school and .08 at the second. The effect size for Woodcock Word Identification for first grade at-risk students tutored in the Prevention of Learning Disabilities program was .94, but only .16 for total reading achievement. The Wallach Tutoring Program effect sizes ranged from .64 to .75 on various measures. Finally, Programmed Tutorial Reading had an effect size of .57 for a vocabulary measure and .53 for a comprehension test. For the students who received only 15 minutes per day of tutoring, however, the effect size dropped to .09 on the vocabulary measure and .13 on the comprehension test. Because Programmed Tutorial Reading utilized paraprofessionals for tutors and tutored first graders for 15 minutes per day, it is the most comparable to the current study. Using the Edmark program with at-risk first graders resulted in an effect size for WRMT-R Word Identification of .19, for Passage Comprehension, .49, and for the Edmark posttest, 1.2. Based upon these data, it can be concluded that the tutoring program conducted in this study could pass a test of cost-effectiveness.

An additional factor in determining a program’s cost effectiveness, according to Wasik and Slavin (1993), is the immediate and long-term impacts on the costs of education for low achievers due to reductions in retentions and special education placements. Reduced retentions and special education placements have been shown for both Reading Recovery and Success for All. Reading Recovery, for example, has resulted in 22% of its tutored students being retained in first grade or assigned to special education, as opposed to 31% of the control group. Reading Recovery does not
tutor students who are already receiving special education services. For the current study, retention figures will not be available until completion of the second semester of the 1999-2000 school year. At the end of the first semester, however, 11 experimental group participants, or 35%, were failing reading, which would result in grade retention if their reading average were not to improve by the end of the year, compared to 12 control group participants, or 41%.

Several study participants were receiving special education resource services at the beginning of the intervention, others began receiving services during the intervention, and a few were going through the referral process at the completion of the intervention. It will not be possible to determine the intervention’s effect on special education placements, however, until at least the end of the school year, due to the length of time involved in the evaluation process. In a personal telephone communication with the researcher, a member of the participating parish’s pupil appraisal office explained that any children who began receiving services during the first semester were referred during the previous school year. If referrals were made by School Building Level Committees and parental permission for evaluation were received at the beginning of the school year, pupil appraisal would have until December 2 to complete their evaluation. At that time, special education has an additional 30 days to hold the children’s IEP conferences, obtain parental permission for placement, and initiate services. The study’s effect on special education placement would thus need to be determined during the next academic year, or even later. Lyon (1996) and Vadasy et al. (1997a) have pointed out that despite the need for early identification and
intervention, most school districts do not identify learning disabled students until they are reading well below grade level, usually in grades three to six. It should also be noted that most reviewed articles dealing with reading disabled students remove from their sample any students with an intelligence quotient (IQ) below 85 (Swanson, 1999). The current study did not give IQ tests to participants; it is therefore possible that some students could eventually be identified as eligible for special education services due to mental retardation.

Summary of Interpretation of Results

This study demonstrated that the *Edmark Reading Program*, which had previously only been studied with children with mental retardation, could successfully be used to increase the sight word vocabulary and comprehension skills of at-risk first graders. The study also demonstrated the efficacy of utilizing volunteer America Reads tutors to implement the program, rather than certified teachers. The low cost of program implementation, coupled with its effectiveness, could make the replication of the study feasible for other school systems with limited financial resources. While the effect size of the intervention on the WRMT-R Word Identification subtest was small (.19), the effect size for WRMT-R Passage Comprehension was moderate (.49), and for the 150 *Edmark* posttest words, large (1.2). In comparison, the average effect size for one-on-one tutoring programs with at-risk first graders is .40 (Cohen et al., 1982). The qualitative data collected in the study revealed significant improvement in more experimental than control group students on reading ability, as well as attitude toward reading, reading class, school, and self. Participant interviews also revealed positive
attitudes on the part of students toward reading, reading class, and school, supporting the need to prevent deterioration of such attitudes because of reading failure. The study also revealed administrators' misperceptions of student attitudes and ignorance of 25% of study participants attaining Honor Roll status. The discussion also addressed possible explanations for non-significant differences between the two groups on the WRMT-R Word Identification subtest, and an analysis of Edmark and WRMT-R words was discussed.

While the results of this study support the efficacy of a supplementary tutoring program for at-risk first graders both in terms of academic achievement and positive attitudes toward reading, school, and self, the study itself was not without limitations. Due to the small number of participants (N=60), care should be taken in generalizing results beyond at-risk first grade students in the participating parish. While students were randomly assigned to experimental and control groups at each of the three participating schools, they were purposefully selected by their teachers and principals in an attempt to identify the lowest-performing 20-30% of first graders in reading at each school. Adherence to selection criteria by principals and first grade teachers could not be verified. Using such a low achieving population also introduced the possible problem of regression to the mean. In addition, while the researcher did complete checklists to assure fidelity to program implementation by the tutors, there were substantial differences in tutors' levels of absenteeism. Also, one tutor was able to remain at her assigned school throughout the first semester, while the other two schools experienced two different tutors.
In an attempt to partially control for the Hawthorne Effect, control group students were read aloud to for 15 minutes per day by the same volunteer tutors who delivered the treatment. Because the number of volunteers available precluded their reading to the students individually, however, the Hawthorne Effect could not be completely controlled, nor could students be taught the 150 Edmark words using another instructional method. During the collection of qualitative data, the researcher was not able to contact all parents/guardians due to disconnected or inaccurate telephone numbers which had been given to the schools. Furthermore, all qualitative data collected from key informants on the students' attitudes toward reading, school, and self were subjective, as no attitudinal instruments were used.

Additionally, no data were available on the validity or reliability of the Developmental Reading Assessment (DRA) administered to participants at the beginning of the school year by their respective first grade teachers. The DRA can only be said to have "field validity," in that the participating schools, as well as all public elementary schools in Louisiana, use this test to determine if students are below, on, or above grade level in reading. Finally, the researcher could not be considered totally without bias toward the Edmark Reading Program after having used it for 13 years. To partially control for this bias, an external evaluator was brought in to conduct all post-intervention testing. While the researcher's inherent bias toward desiring the program to improve the reading performance of participating first graders could have influenced her perception of the qualitative data, it is doubtful that permission would have been given by parents or the schools to remove 60 students from their regular class
instruction for 15 minutes per day for one semester without the researcher having made a strong case for the possibility of program effectiveness. Because experimental group students left their classrooms one at a time, and control group students left in small groups, all first grade teachers were aware of students’ experimental or control group status. This could have possibly effected their responses in the post-intervention interviews, as well as their treatment of students throughout the semester. In addition, the students’ awareness of there being two different groups could have resulted in the John Henry Effect.

**Implications for Practice**

The results of the study supported the efficacy of using a supplementary sight word intervention with first grade students at-risk for reading failure. Based upon the findings of this study and research examined in the review of literature, the following recommendations are made:

1. Schools which are not financially able to implement effective yet expensive programs such as Reading Recovery and Success for All should consider tutoring for first grade students at-risk for reading failure using the Edmark Reading Program. While previous research has proven its efficacy with children with mental retardation, this study lends support to its effectiveness with at-risk first graders.

2. Schools should consider utilizing paraprofessionals or volunteers to implement such a program. The key to success in utilizing non-certified tutors appears to be matching the program implementation requirements to
the skills of the tutor. In the case of the *Edmark Reading Program*, its highly structured format allows successful implementation by non-certified volunteers.

3. Schools wishing to implement a supplemental tutoring program should investigate the possibility of utilizing America Reads volunteers. These volunteers are usually college students who tutor reading at no charge to the school in exchange for financial aid from their college or university.

4. This study supported the effectiveness of using *Edmark's* errorless discrimination method to teach a 150-sight word vocabulary with at-risk first graders. It is possible that this method could be used to teach students other selected vocabulary lists.

5. Schools which teach reading using a purely phonetic approach should consider teaching sight words as a supplementary intervention for students with low phonemic awareness and phonological decoding skills. This study supported the special education principal of building on strengths while remediating weakness, and this principle should be considered in the teaching of at-risk students.

6. Schools should consider early intervention with students at-risk for reading failure in order to not only prevent academic failure, but also the deterioration of their attitudes toward reading, reading class, school, and self.
7. Since the literature supports the effectiveness of early identification of reading problems, schools should consider testing children on letter and phoneme awareness at the end of kindergarten or beginning of first grade, with special concern for those children repeating kindergarten or first grade.

8. Teachers should make administrators aware of at-risk students’ positive attitudes toward school in general and reading in particular, as well as their significant academic progress, such as the attainment of Honor Roll status.

9. Schools should permit first grade students to take home basal readers and library books so that they may practice emerging literacy skills at home.

Recommendations for Further Research

Based upon the findings of this study, the following recommendations are made for future research in this area:

1. In order to better control for the Hawthorne Effect, replications of this study should provide one-on-one tutoring in another subject area, using the same tutors used with the experimental group, to all control group students.

2. Because of the small number of participants in this study, it should be replicated with a greater number of first graders in geographically and economically diverse schools before its results can be generalized to all first graders at-risk for reading failure.

3. In order to determine the intervention’s impact on grade retention and special education placement, participants should be followed through third grade. Such long-term follow-up could also provide data on the long-term
benefits of the program in terms of both academic achievement and attitudes toward reading, reading class, school, and self. The results of standardized tests and other performance measures of reading ability given in third grade would provide critical information in determining the cost-effectiveness of the intervention.

4. Further research should be conducted to determine which children would benefit most from the *Edmark* intervention. Since no program works with all students, it would be advantageous to identify the academic and testing profile of students who would exhibit the greatest gains using a sight-word training program. Such information could also have implications for the most effective instruction of these students in the regular classroom.

5. In order to extend the preventive nature of the program, its implementation should be considered with kindergarten students who are failing reading by the end of the first semester. In addition, the effects of continuing tutoring until participants complete all of Level I of the program should be studied, as should the effects of continuing the program through the completion of Level II.

6. To determine the effectiveness of using other volunteers to implement the *Edmark Reading Program*, this study could be replicated using parents, grandparents, paraprofessionals, Chapter 1 Aides, or peer tutors. Tutoring programs conducted outside of the school day could consider increasing the daily tutoring time.
Summary

This study indicated the effectiveness of a 15-minute per day one-on-one highly structured sight-word tutoring program with first graders at-risk for reading failure. Students receiving training in the Edmark Reading Program outperformed control group participants on both a standardized measure of reading comprehension and reading the 150 words taught in the program. Interviews with key informants indicated significant gains in attitudes toward reading, reading class, school, and self for more experimental group than control group students. This study attempted to expand upon existing research by combining the elements of one-on-one tutoring, administration by volunteers, a highly structured program designed to teach only sight words, and at-risk first grade readers, regardless of disability classification or repeater status, who were in the regular classroom. While no one treatment can help all students, this study sought to determine if one 15-minute per day intervention could act as “water wings” for struggling students—if it could prevent “drowning” in reading failure by supplying the “water wings” of a sight word vocabulary to keep the children’s heads “above the water” until they learned how to “swim” by applying critical phonological and metacognitive strategies taught in the regular classroom reading instruction.

In a report prepared for the U. S. Department of Education in 1990, McPartland and Slavin explained that third graders who (a) read one year below grade level, (b) have been retained in one grade, (c) come from low socioeconomic backgrounds, and (d) attend school with many other poor children have almost no chance of graduating from high school. The majority of participants in this study came...
from low socioeconomic backgrounds and attended school with many other poor children. Sixteen of them had already repeated a grade, and most of them were reading below grade level when the study began. No educator or researcher can change the socioeconomic status of students, the fact that they go to school with many other poor children, or their having repeated a grade. The only thing educators can do is attempt to assure that all children are reading on grade level by the third grade. Unfortunately, the very schools whose students come from low socioeconomic backgrounds are the schools which often cannot afford the most researched and most effective programs, such as Reading Recovery or Success for All. Hopefully, the results of this study will encourage such schools to seek out economically feasible programs which can still have a positive, albeit smaller, effect on the reading achievement of their at-risk students.
APPENDIX A

DESCRIPTION OF THE EDMARK READING PROGRAM
The experimental group treatment in the study consisted of 15 minutes of one-on-one instruction in the *Edmark Reading Program* (1992), beginning with Level I, and continuing as far as student progress permitted, through Level 2. The *Edmark Reading Program* is a sequenced, highly repetitive sight word approach. The program manual describes the small steps in word acquisition that provide intrinsic motivation through high levels of success (an approximate correct response rate of 90% or better).

The *Edmark Reading Program* (1992) is based on the belief that for many children who have never mastered beginning reading and language, a carefully sequenced, highly repetitive sight word approach offers the highest probability of success (*Edmark*). The program's methodology was developed through research conducted in the 1960's; the *Edmark* manual does not reveal the name of the program author(s). The program became commercially available in 1972; the second edition used in the study was published in 1992. The program manual states that Level 1 of the program has proven effective with preschool students (ages three to five years), elementary students having difficulty with traditional classroom reading materials, adults, ESL (English as a Second Language) students, and most special education students. The literature, however, only reports the program's use with trainable mentally retarded (TMR) students.

In a personal communication to the researcher on November 30, 1999, Mary Ann Trower of the Edmark Corporation explained the origin of the 150 words taught in Level I of the program. According to Ms. Trower, the words were selected by the original researchers who developed the program in 1972 from the Dolch list and first
grade readers, with the addition of capitals, punctuation, endings -s, -ed, and -ing. Ms. Trower explained that the order of words taught was chosen to provide a way for the students to read words together in sentences very early, as well as to provide a way to check comprehension at an early point. The intent was to help the students perceive themselves as readers at an early stage in the reading process.

The Edmark Reading Program (1992) uses small, incremental steps which ensure high success rates (usually over 90% correct answers, according to the program manual) by teaching one word at a time and by utilizing an errorless discrimination method. The term “errorless discrimination” was first discussed by Terrace (1963), who maintained that responses to S- (“errors”) are not a necessary condition for the formation of an operant discrimination of color. In his experimental research with pigeons, Terrace established that errors do not occur if discrimination training begins early in conditioning and if S+ and S- initially differ from each other. Such errorless discrimination training eliminates the need to extinguish responses to S-. Prior to Terrace’s work, it was believed that extinction of responding to S- was a necessary condition of the formation of a discrimination. The Edmark Reading Program (1992) utilizes errorless discrimination in its method of teaching words through shaped sequences of visual and auditory-visual matching-to-sample, with the target word (S+) initially appearing alone, and eventually with orthographically similar words (Walsh & Lamberts, 1979).

Level 1 of the program uses five types of lessons: (a) pre-reading, (b) word recognition, (c) direction cards, (d) picture/phrase cards, and (e) story book, in order to
teach its 150 basic sight word vocabulary, including endings -s, -ed, and -ing. The 150 words can be found at the end of this Appendix. The experimental and control group students in the study will be asked to look at and pronounce each of the 150 words, which will be presented in isolation, using the vinyl display mask; this will be considered the Edmark Posttest. According to program developers, Level 1 of Edmark (1992) takes a non-reader to approximately 1.0 (beginning first grade) reading level. Level 2 teaches an additional 200 sight words, including compound words, resulting in a reading level, according to the program, of 2.0 to 3.0 (beginning second to beginning third grade).

Student prerequisites for participation in the program are minimal: (a) the ability to point to select a correct choice from a multiple-choice array, (b) the ability to repeat words, and (c) sufficient receptive language to follow teacher directions. The program begins with Pre-Reading lessons that teach visual discrimination, followed by a Discrimination Test that requires the student to match-to-sample letters, groups of letters, numbers, and words. The teacher may begin with the Discrimination Test; a student making no more than four errors may skip the Pre-Reading lessons. Any student who demonstrates a lack of prerequisite program skills by not passing the Discrimination Test will complete the Pre-Reading lessons in the program which teach the needed discrimination skills. The student will then retake the Discrimination Test. A copy of a Pre-Reading lesson and sample Discrimination Test page can be found at the end of this Appendix.
Students then begin the Word Recognition lessons, 60 of which each introduce one new word or the endings -s, -ed, or -ing, followed by 48 lessons teaching two words each. The lessons consist of many "frames," or one line of words visible through a vinyl display mask. The word to be taught is first introduced in isolation (e.g., "horse"), and the student is directed to point to "horse." The following frames present "horse" and two other letter groups or words; the students is instructed to find "horse." Finally, the word is presented in isolation and the student is directed to read the word. Students are praised for correct responses; if students say the incorrect word they are simply told the word, asked to read it again, and then praised for their response.

Subsequent lessons present the words in meaningful sentences. A sample Word Recognition lesson introducing the first word taught ("horse") can be found at the end of this Appendix.

After five words are introduced, comprehension activities are added to the program's lesson sequence. Direction Card lessons teach the meaning of the words and how to follow increasingly complex instructions. Each card contains six phrases or sentences (e.g., "a yellow car and a boy"). Students find the appropriate objects from a set of color illustration cards and place them under the stimulus phrases or sentences. A sample Direction Card can be found at the end of this Appendix. Story Book lessons present stories of increasing length and complexity, using only the words previously taught. In Level 2, the teacher asks the student oral comprehension questions for each story. A sample Story can also be found at the end of this Appendix. Picture/Phrase Card lessons provide further comprehension exercises, as students choose words,
phrases, or sentences to describe illustrations of objects, situations, or events (e.g., "The boy runs fast" is placed under a picture of a running boy). A sample Picture/Phrase Card can be found at the end of this Appendix.

Each word taught is repeated throughout the program to attain permanent acquisition. After every 10 new words, the student takes a posttest consisting of reading (pronouncing orally) the words in isolation. When a word is missed, the student is to repeat the lesson where the word was introduced before re-testing. The *Edmark Reading Program* (1992) will be taught according to the lesson sequence presented in the program's *Student Record Book*. One record book will be maintained for each student in the experimental group.

The published research on the *Edmark Reading Program* (1992) reports its use only with mentally retarded students. In 1977, Vandever and Stubbs studied 21 trainable mentally retarded (TMR) students who received two years of instruction in Level 1 of the *Edmark* program at two different schools. Their research was designed to investigate the acquisition, retention, and transfer of reading skills in TMR students, a group previously considered incapable of learning to read. The 21 participants in this study had a mean chronological age of 14 years 9 months and had previously failed to acquire significant reading skills. Students received 15 minutes of one-on-one instruction in the *Edmark Reading Program* daily; in one-half of the participating classrooms aides presented the program.

Students were tested on two word lists in October and May of both treatment years. One list presented the 150 Level 1 words that had been taught in order to test
acquisition and retention, and the second consisted of 32 high frequency words not taught in *Edmark* in order to test transfer. A single-factor repeated measures analysis of variance was used to analyze data on the acquisition-retention words, and another for the transfer words. Significant effects were obtained for both groups of words.

While the researchers warned caution in interpretation of their data due to the small number of study participants and their not using a control group, they did conclude that TMR children can retain reading skills over the summer months and can demonstrate some transfer to untaught words. While Vandever and Stubbs (1977) speculated that instruction in phonics would have resulted in greater transfer than did the whole-word approach, they pointed out that the *Edmark* method allowed the TMR students to learn words more quickly than with phonics instruction, due to not needing mastery of many sounds before words could be decoded.

The effectiveness of the *Edmark Reading Program*’s (1992) errorless discrimination technique was compared to that of a picture-fading technique in a study by Walsh and Lamberts (1979). The picture-fading approach paired the stimulus word with a picture representing the word, as the instructor verbally introduced the word (“Look at this word. This word is ______”). Over a series of six exposures, the picture was then progressively faded until only the stimulus word remained. In the *Edmark* errorless discrimination method, the target word appeared alone and the instructor asked the student to “Point to the word ____.” Over the next four to six exposures, the target word was presented with grossly dissimilar letter configurations and then with
other words. Finally, the student was instructed to read the target word presented in isolation.

Thirty TMR students were trained on 20 words that all were unable to identify at pretest, for 10 minutes per day for 5 successive days in each treatment. Instruction was given individually by the regular classroom teachers and posttests were given on the day following completion of the intervention. Data were analyzed using analysis of covariance, separately for each of the three measures (word identification, word recognition, and picture-word matching), with pretest scores as covariates. Performance differences favored the errorless discrimination treatment. Students recognized more words and were more successful on picture-word matching after the Edmark (1992) treatment. Treatment differences were greatest and most consistent on the word-identification posttest, in which words were printed in lowercase primary type on 8 x 13 cm cards and students were instructed to pronounce the words. The word recognition posttest consisted of the presentation of three words cards and the students being instructed to “Point to the word ______.”

The researchers concluded that the design of the Edmark (1992) program, based upon its exclusive word focus discrimination procedure, may be particularly suited to beginning readers. Walsh and Lamberts (1979) hypothesized that if the graphic informational value of words is low at first in beginning readers, then deliberate training to attend to discriminative orthographic configurations may speed up the transition to graphic consciousness. Walsh and Lamberts, like Vandever and Stubbs (1977), pointed out that their study lacked a control group.
In his review of research on reading instruction for children with moderate mental retardation, Conners (1992) examined all published research in the areas of sight-word instruction, word-analysis instruction, and oral reading error-correction with his target population. The author concluded that both sight-word instruction and word-analysis instruction are feasible and appropriate for use with children with moderate mental retardation. In the area of sight-word instruction, Conners stated that the literature suggests that picture integration, constant delay, and the *Edmark Reading Program* (1992) were the most effective methods.
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1. Put a little ball and a blue car in a green box.

2. A yellow airplane and a girl

3. A little chicken and a blue spoon in a box
The girls are running and playing. Mother puts ice cream on the table.

"Go find a spoon," I said. "Father has spoons." I sit in a chair in the grass.
There is a blue cup.

He sits in the boat on the water.

He is under the paper.
**EDMARK LEVEL I WORDS**

<p>| horse          | is       | ride      | purple   |
| a             | big      | dog       | she      |
| car           | spoon    | under     | father   |
| yellow        | my       | tree      | are      |
| see           | pencil   | long      | bird     |
| ball          | red      | flower    | not      |
| and           | banana   | he        | chair    |
| fish          | cow      | said      | telephone|
| boy           | find     | black     | or       |
| I             | egg      | sky       | grass    |
| airplane      | water    | on        | sit      |
| the           | blue     | table     | ice cream|
| girl          | go       | funny     | there    |
| little        | candy    | up        | we       |
| in            | has      | bread     | book     |
| box           | mother   | cat       | happy    |
| green         | eat      | school    | can      |
| put           | boat     | play      | paper    |
| chicken       | you      | teacher   | one      |
| with          | orange   | run       | drink    |
| apple         | to       | it        | at       |</p>
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Interview Questions

I. Prior to treatment:

A. Kindergarten teachers

1. Describe (participant’s) performance in reading in your classroom.

2. How would you describe (participant’s) attitude towards school in general, and towards reading in particular?

B. Student participants

1. Do you like to read? Why or why not?

2. Do you read at home? Why or why not?

3. Do you like reading class in school? Why or why not?

4. Do you like school? What do you like most? Least?

C. Principals and Assistant Principals

1. Traditionally, what would you expect to be the reading performance and grades of the bottom 20% of entering first graders in this school?

2. How do you view these children in terms of ability?

3. What are the attitudes towards school usually displayed by these children?

II. After treatment:

A. Parents
1. What changes have you seen this school year in the reading ability of your child? If there are any, to what do you attribute the change(s)?

2. Has your child’s attitude towards reading changed? If so, to what do you attribute the change?

3. Has your child’s attitude towards school changed? If so, to what do you attribute the change?

4. Has your child’s attitude towards himself or herself changed? If so, to what do you attribute the change?

B. First Grade Teachers

1. Describe (participant’s) performance in reading. In what way(s) has this performance changed since the beginning of the year? To what would you attribute the change?

2. Describe (participant’s) attitude towards reading. In what way(s) has this changed since the beginning of the year? To what would you attribute the change?

3. Describe (participant’s) attitude towards school. In what way(s) has this changed since the beginning of the year? To what would you attribute the change?

4. Describe (participant’s) attitude towards himself or herself. In what way(s) has this changed since the beginning of the year? To what would you attribute the change?
C. Student Participants

1. Do you like to read? Why or why not?
2. Do you read at home? Why or why not?
3. Do you like reading class in school? Why or why not? Is it better or worse than reading class was last year in kindergarten? Why?
4. Do you like the reading that you and your tutor do together? Why or why not?
5. Do you like school? Why or why not? What do you like the most? The least?

D. Principals and Assistant Principals

1. Please describe any changes you are aware of in the participants in terms of reading ability, reading grades, attitudes about school.
2. Do you see a difference in the two groups of children? If so, to what do you attribute the change?
APPENDIX C

CORRELATION COEFFICIENTS
## Correlation Coefficients

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** p < 0.01 level  
* p < 0.05 level

R/N  = Repeater/Nonrepeater Status  
GR  = Grade Repeated  
LIDPR = WRMT-R Letter Identification Standard Score Pretest  
LIDPO = WRMT-R Letter Identification Standard Score Posttest  
WIDPR = WRMT-R Word Identification Standard Score Pretest  
WIDPO = WRMT-R Word Identification Standard Score Posttest  
WAPR = WRMT-R Word Attack Standard Score Pretest  
WAPO = WRMT-R Word Attack Standard Score Posttest  
DRA  = DRA Pretest  
PC  = WRMT-R Passage Comprehension Standard Score Posttest  
Edmark = Edmark Posttest
REFERENCES


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VITA

Laureen Goers Mayfield was born in Staten Island, New York but grew up in Atlanta, Georgia and Jackson, Mississippi. She graduated as valedictorian of her high school class at St. Vincent’s Academy in Shreveport, Louisiana in 1972. Ms. Mayfield then attended the University of Notre Dame as a National Merit Scholar, and graduated Magna Cum Laude with a Bachelor of Arts degree in English in 1976. While at Notre Dame, Ms. Mayfield was inducted into Phi Beta Kappa. She received a Master of Education degree in Special Education, with an emphasis in Learning Disabilities and Emotional Disturbance, in 1981 from the University of Southern Mississippi in Hattiesburg, Mississippi.

Ms. Mayfield began her teaching career by designing a program for Emotionally Handicapped and Autistic students at Ellisville State School in Ellisville, Mississippi. She has subsequently taught at Columbia State School in Columbia, Louisiana; Ruston Developmental Center in Ruston, Louisiana; and in three public elementary schools in Ruston, Louisiana. Her 15 years of experience include teaching in self-contained, resource, and inclusion classrooms.

In addition to teaching courses at Louisiana Tech University, where she held a doctoral teaching assistantship, Ms. Mayfield is an adjunct faculty member at Centenary College in Shreveport, Louisiana. She has most recently presented papers at the
Louisiana Educational Research Association annual meeting in Lafayette, Louisiana, and the Mid-South Educational Research Association annual meeting in Point Clear, Alabama.

Ms. Mayfield may be contacted through email at mayfield@bayou.com.