

**LONG-TERM EFFECTIVENESS OF THE
READING RECOVERY PROGRAM**

MICHAEL DWAYNE SHOULDERS

Long-Term Effectiveness of the
Reading Recovery Program

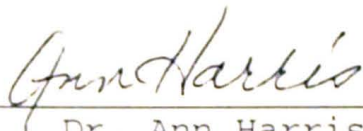
A Field Study
Presented to the
Graduate and Research Council of
Austin Peay State University

In Partial Fulfillment
for the Requirements for the Degree
Education Specialist

by
Michael Dwayne Shoulders
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To the Graduate Council:

I am submitting herewith a Field Study written by Michael Dwayne Shoulders entitled "Long-Term Effectiveness of the Reading Recovery Program." I have examined the final copy of this paper for the form and content, and I recommend that it be accepted in partial fulfillment of the requirements for the degree of Education Specialist, with a major in Administration and Supervision.



Dr. Ann Harris,
Major Professor

We have read this Field Study and recommend its acceptance.



Dr. Carlette Hardin



Dr. Ronald Groseclose

Accepted for the Committee



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ABSTRACT

This research study was conducted to evaluate the effects of long-term gains of Reading Recovery students when compared to a control group. This study hypothesized that there would be no long-term significant differences in the reading achievement scores of the 131 students. The study examined the national percentile scores from the 1999 TerraNova exam for reading composite. Scores for students who were in grades two, three, four, and five were used.

The results were analyzed using a t-test of means of the TerraNova reading composite scores ($p < .05$). The findings from this study indicated no significant long-term differences in the reading achievement of students who learned to read using the Reading Recovery method.

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CHAPTER 1

INTRODUCTION

Since the ability to read is a crucial life skill, many school systems provide extra help for students having difficulty with that subject. When do students receive additional help in reading? According to Slavin and Madden, historically, it has been after children fail to read that they benefit from supplemental reading programs such as Title I or special education (as cited in Donley, Baenen, & Hundley, 1993). Students who have difficulty reading face the possibility of retention. Therefore, supplementary programs can be costly and offered too late in the students' education.

One of the most popular approaches to help students before they experience reading difficulty is the New Zealand import known as Reading Recovery. This is a preventive, intervention reading program started by Marie Clay. It has been implemented extensively in the United States over the past 15 years (Dudley-Marling & Murphy, 1997; Hiebert, 1994).

Reading Recovery is designed to accelerate the progress of the lowest 20% of first grade readers (Bracy, 1995; Donley et al. 1993). Reading Recovery is a half-day, individualized one-on-one program. These daily classes feature personalized lessons 30 minutes in length. Students remain in the program until they are able to function on grade level or have received 100 lessons (Center, Whendall, Freeman, Outhred, & McNaught, 1995; Donley et al. 1993).

A typical Reading Recovery lesson includes seven phases:

- 1) Rereading a familiar book
- 2) Independent reading of the previous day's book
- 3) Letter identification -- if necessary
- 4) Student-generated story writing
- 5) Reconstructing a cut-up story
- 6) Introduction of a new book
- 7) Reading a new book

When students reach grade average reading proficiency or have had lessons for 20 weeks, they are discontinued from the program and that slot is filled by another student. On average, a Reading Recovery teacher works with 8-10 students during the course of the school year (Center et al. 1995). According to Pinnell, Deford, and Lyons, approximately 75-85% of the lowest 20% of children served by Reading Recovery achieved reading and writing scores in the average range of their class and received no additional supplemental instruction (as cited in Swartz & Klein, 1994).

Reading Recovery advocates claim their program identifies reading problems early and is less expensive than retention or other forms of remedial help in later grades. This supposition has sparked many researchers to debate the validity of these claims.

Hiebert (1994) cited a 1992 analysis by Dyer of the cost of Reading Recovery versus other types of services. However, Hiebert points out that although Reading Recovery touts most full-time employed Reading Recovery teachers will serve 16 students per year, four assumptions of this claim

may not be consistent with other Reading Recovery sites:

1) The program is successful with all students.

2) All students remain successful in subsequent years and do not need additional special services.

3) One full-teaching equivalent Reading Recovery teacher consistently serves 16 students.

4) Students in other programs do not attain proficient reading levels.

"Using the average student-teacher ratio of 11:1 from the three primary training sites, the cost of tutoring per student at Grade 1 would be \$3,000 and, using the figure of 86% of the students attaining the average school level, \$3,488 for each tutee reading at the average school level at the end of Grade 1. When figures are calculated on the basis of success levels of tutees at Grade 4, the figure of 36% from the longitudinal sample would put the cost per successful student at \$8,333" (Hiebert, 1994, p.22).

These figures are based on the teacher's annual salary and excludes other charges. Every teacher must undergo a full year's training in order to be Reading Recovery certified. The cost for training one teacher in this method can be as much as \$17,000. This amount does not include required teaching materials, training facilities and mentor visits (Ruzzo, 1999). Teachers must train in a room with a one way mirror in a situation called "behind the glass." Although the cost varies greatly, it can cost a school system over \$7,000 to install the mirror system. Finally, adding to this cost, Reading Recovery teachers are required to participate in

ongoing staff development following the initial training year. This fee for one southern state was \$500 per teacher for the 1999-2000 school year. When the costs for training, materials, facilities, and mentor visits are added to teachers' salaries, the cost per student increases significantly.

Statement of the Problem

The purpose of this research study was to make a comparison of long-term gains of Reading Recovery students compared to a comparable control group. Proponents of the Reading Recovery method believe the program recovers students from a life of reading struggle and that once students have had Reading Recovery training, they will never need additional reading services. This method of reading instruction, though, is extremely costly and time consuming. Primarily, school systems refuse to use this method for three reasons: it is cost prohibitive, time consuming, and questionably unsustainable to maintain grade level reading.

The importance of this study lies in the enormous expense of Reading Recovery measured against the sustained gains of the students served. There is a demand for educators to be accountable to the public for how its educational funds are spent. If this program's gains are not sustained, the funds spent on it may be viewed as wasteful. From this study and its findings, there should be an interest to school administrators who are currently using Reading Recovery for their first graders and for other administrators considering this training for their teachers.

To determine sustained effects for Reading Recovery students, a study of current research was conducted. Students who had Reading Recovery lessons and are in third, fourth, fifth, and sixth grades were compared to students who were of the same grade level, who had similar reading ability at the beginning of first grade, and who did not receive Reading Recovery instruction. Standardized test scores were analyzed for both groups of students. Teacher questionnaires were completed to determine the reading level for each student and which students were referred for special reading classes during the current school year. Summaries are made regarding whether students who have had Reading Recovery outperformed non-program students.

Research Questions

The following questions were addressed in this study:

1) To what extent do Reading Recovery students score above non-program students in grades two through five when examining the national percentile score for Reading Composite on the TerraNova?

2) To what extent do Reading Recovery students receive referral to remedial programs in grades 3-6 when compared to non-program students?

3) To what extent do Reading Recovery students read on or above grade level when compared to non-program students as determined by teachers' perception of reading ability in regular classroom settings?

Statement of the Hypothesis

Students who were discontinued from Reading Recovery

classes will show no long term significant difference in their reading achievement scores when compared to students who did not receive Reading Recovery instruction as measured by the TerraNova exam.

Definition of Terms

Discontinued students - Students who completed 60 Reading Recovery lessons or those students who were successfully exited from the program prior to attending 60 lessons.

Intermediate students - Students in grades four or five.

Selection sheet - Reading Recovery data sheet used to record initial assessment scores on students referred to the Reading Recovery program.

Primary students - Students in grades one, two, or three.

Reading Recovery - an early intervention program for 1st grade children at-risk in learning to read.

Reading Recovery students - Students who received Reading Recovery instruction.

Tennessee Comprehensive Assessment Program - (TCAP) Nationally normed achievement tests which are administered statewide to Tennessee students.

TerraNova - Nationally normed achievement tests administered statewide to Tennessee students in grades 1-8 since 1998.

Limitations to the Study

1. Only two of the ten systems in the sample population have had the Reading Recovery program for more than four years.

Therefore, not all schools included in the study will have Reading Recovery students in grades four and five.

2. The long-term effects of any intervention are difficult to measure because there are many intervening variables which can influence children's progress (e.g., quality of subsequent classroom instruction, promotion and disciplinary policies, student's health, mobility, and individual life circumstances).

3. The achievement scores will be based exclusively on TerraNova, a part of the Tennessee Comprehensive Assessment Program.

Relationship of the Problem

A cost effectiveness study will give a better view as to Reading Recovery's worth to a school system and specifically to the students it serves. If the students' academic gains are sustained through the elementary years, Reading Recovery may be seen as a viable option for school systems.

Chapter 2

Review of the Related Literature

Early Intervention

A certain percentage of students who enter school each year experience difficulty reading. Some students enter school from literacy-improverished homes void of print material (Spiegel, 1995). When students are diagnosed as having reading difficulties, systems may be able to provide addition help. However, according to Pikulski (1994), it is important to help students overcome reading problems early in their school years. The older the child, the more useless remedial efforts become. Research by Pikulski found little evidence to suggest remedial programs are effective after first grade. According to Kennedy, Birman, and Demaline, any efforts to correct reading deficiencies beyond third grade are mostly unsuccessful (as cited in Pikulski, 1994). Furthermore, an argument made by Milofsky is that a program which can easily make gains in reading may have all efforts thwarted when those students return to regular, and perhaps, chaotic, school programs (as cited in Dudley-Marling & Murphy, 1997).

Growth of Reading Recovery

Prior to the mid-1990s, there had been a conspicuous absence of research on lower functioning readers such as students in Chapter 1 (Hiebert, 1994). Hiebert reported researchers historically study the average and above-average

reader and generalize their findings to the lowest performing readers. He cautioned this is a flawed and dangerous assumption. One program which contradicts Hiebert's assumption is Reading Recovery. This program has grown tremendously over the last two decades and there is a wealth of research on lower functioning readers.

In analyzing Reading Recovery's historical rapid growth, there was only one training site for Reading Recovery in the United States in 1984. It was located on the campus of Ohio State University. Since then, Reading Recovery has grown tremendously. By 1993, the program had grown to over 201 sites in the United States (Hiebert, 1994). In the 1997-1998 school year, Reading Recovery served 122,935 children in the United States in 9,800 schools (Colvin, 1997; Reading Recovery Council of North America, 1999).

This explosion in Reading Recovery has lead to a wealth of conflicting studies as to the long-term effectiveness of the program on students in the elementary years. The literature includes research which supports lasting gains for this approach, particularly in the primary grades. According to Lecture, California claimed an 87% success rate during the 1991-92 school year (as cited in Barnes, 1997). However, there is also research which disputes a difference in student performance between students who had Reading Recovery and those who did not.

The Reading Recovery program is designed to recover students from a life of reading difficulties. This includes retention or referral to any other type of special classes

such as Title I or Special Education.

Characteristics of Reading Recovery

Reading Recovery is based on early intervention, serving only first grade students. Remedial programs such as Title I can serve grades K-12. Traditional remedial programs use worksheets and workbooks and focus on isolated comprehension skills. Reading Recovery stresses larger chunks of printed language and has students read several short books during every lesson. Using a one-on-one approach, Reading Recovery minimizes the opportunity for off-task behavior often observed in other intervention programs (Spiegel, 1999).

Effects for Primary Grades

A study of the effectiveness of the Reading Recovery program in Raleigh, North Carolina, found mixed results. Students served in Reading Recovery had lower special education placement rates in 1990-91 when compared to cohorts, but not for the 1991-92 comparison. Retention rates for the two years presented mixed results as well (Donley et al. 1993).

Second grade teachers rated Reading Recovery students as performing only slightly better than the cohort for the 1990-91 group. In fact, 55% percent of the Reading Recovery students were in the low reading group compared to 65% for the cohort group (Donley et al. 1993). The teacher survey results for the second grade group were ambiguous. No consistent differences emerged between the experimental and non-program groups in terms of reading performance reports.

Donley et al. (1993) found only 77% and 73% of students

in the 1990-91 and 1991-92 programs, respectively, were able to be successfully discontinued. This is nearly the same level of success reached in Clay's analysis of her own program of 70% (Center & Whendall, 1992).

The Donley et al. (1993) study was not without its flaws. The study's research only involved qualitative data. Student performance was analyzed for retention, special education placement, Chapter I services, and teacher opinion of student reading ability. No quantitative analysis was performed.

Pinnell, DeFord, and Lyons found similar results in a Columbus Public Schools study (as cited in Dyer, 1992). Their research indicated that after five years of examination, a high proportion of children served by Reading Recovery sustained progress through third grade without additional intervention.

The Wareham School District in Massachusetts found different results for its students. When an impartial evaluation was conducted by the University of New Hampshire, the New Hampshire Department of Education and the Wareham School District, the program did not meet expectations or produce lasting results. The Wareham School District decided the cost for Reading Recovery was too high for the results it was getting. The system subsequently dropped the program (Collins & Stevens, 1997).

Retention Rates

Dyer (1992) found Reading Recovery reduced the rate of retentions in several schools. The Upper Arlington School

District in Ohio showed an average yearly retention rate of ten students prior to the program's implementation. In the five years after Reading Recovery began, the district retained a total of 17 first graders. That was a reduction of 33 retentions over an equal five year period. Dyer also found the Wareham School District in Massachusetts reduced its retentions from 14 to zero. However, the Wareham School District dropped Reading Recovery for failure to meet district expectations. Dyer's research did not address the retention rate of any grade level other than first grade.

A longitudinal study conducted by Ohio State University showed the experimental group was favored when data was presented in raw unit differences. However, when the data was converted to effect sizes, the differences between the experimental and control group was almost negligible (Center et al. 1995).

Hiebert (1995) questioned whether the United States version of Reading Recovery transplants well from New Zealand. Hiebert argued that schools in New Zealand, where the program originated, were mostly small community schools. New Zealand also enjoyed a high literacy level. This program, she argued, may work well in that situation, but may not prove effective in America's inner cities or poor rural areas.

Effects for Intermediate Students

In a recent study of the effects of Reading Recovery, Wang and Johnstone (1997) evaluated students in the Irving Independent School District in Texas. Their goal was to

determine if students who successfully completed the Reading Recovery program were reading at a grade level average, four years after leaving the program. Three questions were addressed to determine success of the experiment on discontinued Reading Recovery students:

1) Did students avoid referral to remedial programs after first grade?

2) Did students remain above the 40th percentile on the Iowa Test of Basic Skills (ITBS). The Irving Independent School District uses the 40th percentile as the standard for referral to remedial programs.

3) Did students maintain gains in reading comprehension?

The Wang and Johnstone (1997) study compared a traditional cohort group of Title I students from schools which did not offer the Reading Recovery program and a group which received the experiment. Wang and Johnston found students in the experimental group tended to score higher than traditional Chapter 1 students, but lower than non-Chapter I students. The statistical analysis showed a significant difference was less likely between the experimental group and non-Chapter I students than when compared to traditional Chapter I students. Finally, Reading Recovery students were less likely to be referred to special classes and tended to maintain gains in reading comprehension.

Wang and Johnstone (1997) found that, on average, Reading Recovery students read very close to the national average at the end of third grade and decreased slightly, on average, by the end of fifth grade. These students tended to

perform better than students in the Title I comparison group. The authors concluded Reading Recovery is an effective intervention program to help students obtain an average performance level for reading comprehension.

Marie Clay, the founder of the Reading Recovery program, has been criticized for her research techniques. Failure to include the 25-30% of the population who failed to benefit from the program and were withdrawn may have inflated the effectiveness of the experimental group (Center & Whendall, 1992; Center et al. 1995).

Center and Whendall (1992) cited three major errors in Clay's reporting:

- 1) Clay failed to provide information about the students' progress on tests other than Clay's own Diagnostic Survey.

- 2) Clay's research excluded data from the 30% of the students for whom Reading Recovery was found to be inappropriate. These students were either removed or did not successfully complete the Reading Recovery program.

- 3) Clay's control group was not from the same population as the experimental group.

Many children who score poorly on early tests make accelerated progress even without intervention. It could be that the results of the Reading Recovery group were due to error in the initial selection of children for intensive intervention.

Difficulties in Teaching Reading Recovery

Teaching Reading Recovery is no easy task. Barnes (1997)

lists many factors which turned her against Reading Recovery. The enormous amount of paperwork required by Reading Recovery teachers includes attendance records, written analysis, long and short-term goals, daily lesson plans, running records, weekly updates of book-level progress, lists of vocabulary words, and end of year evaluations, to name a few. Reading Recovery paperwork and planning can take up to one hour per day to complete.

Teachers may feel pressured to make tremendous reading gains to validate the cost of the program, including the one-to-one student ratio. Time constraints (30 minutes per lesson) make it difficult to adequately cover the five components of the lesson. Teachers may feel rushed to get through the lesson and unable to allow students to elaborate on their ideas about the text they read or the stories they write.

Barnes found her training to be rigid and contradicted principles of learning such as writing development. In addition, much of what is practiced is counter to classroom practices and leads to confusion for the student.

Some Reading Recovery teachers believe their lessons should not duplicate or mirror classroom activities. Instead, it is the job of Reading Recovery teachers to design daily lessons for the individual child. "Observant teachers know that good readers and writers read and write quickly, and that is our goal for Reading Recovery students." (Browne, Fitts, McLaughlin, McNamara & Williams 1997, p.295).

Some Reading Recovery teachers argue the 30 minute

lessons are not rigid. Teachers have choices on the books used in the lessons, what skills need to be taught, and what instructional prompts are used. Furthermore, with experience, the hurried feeling of completing a 30 minute lesson diminishes in time (Browne, Fitts, McLaughlin, McNamara & Williams, 1997).

The Reading Wars

Reutzel suggests Reading Recovery has been misinterpreted in the United States in that it was never designed to recover 50% of the students reading below grade level. Instead, it was intended to recover only 10-20% of struggling readers. Reutzel reported the United States should look toward New Zealand's Balanced Reading Programmes, which include Reading Recovery, as a model for successful reading instruction. "Surely the recent movement toward balanced literacy in the U.S. should be bathed in the light of proved practices of the past" (Reutzel, 1999, p.323).

In contradicting Reutzel's argument, Welna (1999) states Reading Recovery is being sold as a means to recover more than 20% of struggling first grade readers. Based on a school population of 100 students in grade one, no more than three students would be recovered based on Reutzel's suggestion of a 10-20% success rate for students served by the Reading Recovery program. Welna also questions Reutzel's support for a program that produces lower scoring students than those found in the United States (Shanahan & Barr, 1995; Welna, 1999).

This literature review indicates that further research

is needed to validate the effects of the Reading Recovery program. With the high cost of employing Reading Recovery teachers, long term studies which document the program's influence across elementary years, are needed.

CHAPTER 3

METHODOLOGY AND PROCEDURES

The Sample

The purpose of this longitudinal study was to determine if there were sustained gains for Reading Recovery students when compared to a control group of students who did not receive Reading Recovery instruction. Both groups of students selected for the study were of the identical, current grade level and of similar initial reading ability when tested during the first month of their first grade year.

This study was completed prior to the release of the 2000 TerraNova test results. Therefore, the data collected for this study was relative to students who were in grades three, four, five, and six during the 1999-2000 school year.

The data collected and analyzed reflected reading progress of randomly selected students for each of grades three, four, five, and six in the central region of a southeastern state. Approximately half of the subjects were students who were discontinued from Reading Recovery classes. The data from these students was compared to a randomly selected group of students who formed a control group. The following criteria was used:

- a) students in both groups were of the same current grade level for the 1999-2000 school year
- b) students in both groups were of comparable reading ability when in the first grade based on the Reading Recovery

selection sheet (see Appendix A), and

c) students in the control group did not receive Reading Recovery instruction.

The sample for each grade level included students from five school systems located in the central region of a southern state. A simple random sample was used to identify the five schools used in each of the four grade level groups. Since there were fewer than five systems able to provide data for two grade levels, the sample of 80 students needed for those studies were drawn equally from all available systems.

Procedures

1. There were ten school systems within the designated region who had Reading Recovery teachers. These systems combined for a total of 48 potential Reading Recovery teachers.

System:	Number of Reading Recovery Teachers
#1	10
#2	10
#3	4
#4	3
#5	1
#6	4
#7	2
#8	10
#9	1
#10	3

2. Since two teachers were needed from any selected system, school systems #5 and #9 were combined to comprise one system

with two Reading Recovery teachers. After the five systems were identified through a simple random drawing, two randomly selected Reading Recovery teachers from each system were asked to provide the selection sheet which was used to place students in Reading Recovery for the targeted school year.

3. Permission to collect data for the study was obtained from appropriate school officials (see Appendix B). School officials who agreed to participate in this study were given the opportunity to receive the results for their further evaluation.

4. A checklist for research involving human subjects was provided for each teacher identified for the study (see Appendix C).

5. Teachers selected four discontinued Reading Recovery students by a simple random drawing. A second group of four students was selected for the control group. The control group was identified by a simple random drawing, comprised of students who had similar scores on the Reading Recovery selection sheet as the selected Reading Recovery students.

6. System supervisors provided the Reading Composite score from the 1999 TerraNova exam.

7. Classroom teachers completed teacher questionnaires (see Appendix D). The total number of data sheets returned appear in the following Tables: 3-1, 3-2, 3-3, and 3-4.

Table 3-1

Number of Data Sets Returned - Grade 3

System	<u>TerraNova Scores</u>		<u>Teacher Questionnaires</u>	
	control	experiment	control	experiment
1	0	0	0	0
2	7	8	7	8
4	7	8	7	8
7	7	5	8	5
8	6	7	6	7

Note. For unknown reasons, system 1 did not participate in this study.

Table 3-2

Number of Data Sets Returned - Grade 4

System	<u>TerraNova Scores</u>		<u>Teacher Questionnaires</u>	
	control	experiment	control	experiment
2	9	6	9	5
3	0	0	0	0
6	7	8	7	8
7	4	4	4	6
8	8	8	7	6

Note. For unknown reasons, system 3 did not participate in this study.

Table 3-3

Number of Data Sets Returned - Grade 5

System	<u>TerraNova Scores</u>		<u>Teacher Questionnaires</u>	
	control	experiment	control	experiment
1	0	0	0	0
2	6	2	6	2
3	0	0	0	0
5	2	2	2	2

Note. For unknown reasons, systems 1 and 3 did not participate in this study.

Table 3-4

Number of Data Sets Returned - Grade 6

System	<u>TerraNova Scores</u>		<u>Teacher Questionnaires</u>	
	control	experiment	control	experiment
1	0	0	0	0
2	5	5	5	5

Note. For unknown reasons, system 1 did not participate in this study.

7. Quantitative data was collected from the Reading Composite scores of the 1999 TerraNova exam. The scores were analyzed to determine a group mean for the experimental and control groups. A t-test for independent subjects was used for analysis to determine significance. The resulting means are presented in graphic form.

8. A questionnaire was given to teachers who currently teach the randomly selected students to determine the students' reading ability. Teachers were asked if the students were currently reading below, on, or above grade level. Teachers were asked if the students were referred for special reading classes during the current school year. Permission for administering the questionnaire was contingent upon written approval from each school system's contact person prior to beginning the study. Also prior to the study's beginning, approval letters from each school system was presented to Austin Peay State University's Office of Grants and Sponsored Programs. A letter of informed consent was read by each teacher prior to the study (see Appendix E). Permission was granted from principals at the selected schools.

9. Although Shanahan and Barr (1995) believe all students who have had Reading Recovery instruction should be included in research data, students who were retained were not included in this study. It would not be valid to compare students who received an extra year of instruction to those students who did not.

CHAPTER 4

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This chapter contains a summary and analysis of data collected to test the stated hypothesis. The data was analyzed according to the procedures outlined in Chapter 3.

The stated hypothesis for this study was: Students who were discontinued from Reading Recovery classes will show no significant difference in their reading achievement scores than those students who did not receive Reading Recovery instruction as measured by the TerraNova exam, part of the Tennessee Comprehensive Assessment Program.

The data consisted of national percentile scores on the TerraNova Reading Composite from the 1999 TerraNova exam and two questions on a teacher questionnaire about reading performance in the regular classroom during the 1999-2000 school year. All students selected for this study were referred for Reading Recovery instruction during their first grade year. The experimental group received Reading Recovery instruction. Students in the control group did not receive Reading Recovery instruction. No students who were retained were used in this study.

A t-test was used to determine a significance of difference for each grade level. All scores were then combined and a t-test was used to determine a significance of difference for the total population.

Current Third Grade Students

TerraNova scores of 55 students were submitted for this group from four different school systems (see Table 4-1). The national percentile mean for the control group was 41.3. The national percentile mean for the experimental group was 44.9. Table 4-1

Analysis of Differences Between Control and Experimental Groups in Third Grade

Group	<u>n</u>	Mean	St.Dev.	DF	<u>t</u> -Value
Control	27	41.3	26.6	49	
Experimental	28	44.9	20.9	49	-0.55

$p < .05$

Based on the t-test results, which is a comparison of the two groups for significant differences, the groups appear to be relatively equal according to the items tested on the TerraNova Reading Composite exam. At the .05 level of confidence, the t-test for independent samples for unequal groups showed that there is no significant difference in the third grade groups.

Current Fourth Grade Students

TerraNova scores of 54 students were submitted for this group from four different school systems (see Table 4-2). The national percentile mean for the control group was 39.2. The national percentile mean for the experimental group was 42.8.

Table 4-2

Analysis of Differences Between Control
and Experimental Groups in Fourth Grade

Group	<u>n</u>	Mean	St.Dev.	DF	<u>t</u> -Value
Control	28	39.2	23.6	51	
Experimental	26	42.8	22.7	51	-0.56

p<.05

Based on the t-test results, the groups appear to be relatively equal according to the items tested on the TerraNova Reading Composite exam. At the .05 level of confidence, the t-test for independent samples for unequal groups showed that there is no significant difference in the fourth grade experimental and control groups.

Current Fifth Grade Students

TerraNova scores of twelve students were submitted for this group from two school systems (see Table 4-3). The national percentile mean for the control group was 58.7. The national percentile mean for the experimental group was 48.7.

Table 4-3

Analysis of Differences Between Control
and Experimental Groups in Fifth Grade

Group	<u>n</u>	Mean	St.Dev.	DF	<u>t</u> -Value
Control	8	58.7	22.0	6	
Experimental	4	48.7	19.4	6	0.80

$p < .05$

At the .05 level of confidence, the t-test for independent samples for unequal groups showed that there is no significant difference in the fifth grade groups.

Current Sixth Grade Students

TerraNova scores of 10 students were submitted from one school system (see Table 4-4). The other school system who had students eligible for this study failed to participate. The national percentile mean for the control group was 54.2. The national percentile mean for the experimental group was 34.8.

Table 4-4

Analysis of Differences Between Control
and Experimental Groups in Sixth Grade

Group	n	Mean	St.Dev.	DF	t-Value
Control	5	54.2	32.5	7	
Experimental	5	34.8	25.2	7	1.05

$p < .05$

At the .05 level of confidence, the t -test for independent samples showed no significant difference in the sixth grade groups.

Combined Scores of All Grade Levels

TerraNova scores of 131 students were submitted from six school systems (see Table 4-5). The national percentile mean for the control group was 43.5. The national percentile mean for the experimental group was an exact equal at 43.5.

Table 4-5

Analysis of Differences in Combined
Scores of all Grade Levels

Group	n	Mean	St.Dev.	DF	t-Value
Control	68	43.5	25.7	127	
Experimental	63	43.5	21.6	127	0.0

$p < .05$

At the .05 level of confidence, the t -test for independent samples for unequal groups showed that there is no significant difference when the scores of all grade groups are combined. A complete list of all student scores can be found in Appendix F.

Graphing of Score Differences

In comparing the national percentile scores for the control and experimental groups on a bar graph, it was surprising to note a similarity in the scores of the two groups (see Appendix G). The movement on the bar graph appeared to be a sloping straight line rather than an expected skewness in the experimental group.

Teacher Questionnaire

Teachers were asked three questions regarding student selection for the program and student performance in the regular classroom for the current school year.

Question One

Question one was, "Did this child receive Reading Recovery instruction in first grade?" The answers to this question placed students into groups. Those who had Reading Recovery were placed into the experimental group. Students who did not have Reading Recovery were placed in the control group.

Question Two

Question two asked, "Currently, is this child reading below, on, or above grade level?" Table 4-6 summarizes teacher responses to this question.

Table 4-6

Teacher Questionnaire Responses to Question Two

	<u>Grade Level Reading Performance</u>		
	below	on	above
Grade 3			
control (<u>n</u> =28)	16 (57.1%)	11 (39.3%)	1 (3.6%)
experiment (<u>n</u> =28)	13 (46.4%)	14 (50.0%)	1 (3.6%)
Grade 4			
control (<u>n</u> =28)	16 (57.1%)	11 (39.3%)	1 (3.6%)
experiment (<u>n</u> =25)	16 (64.0%)	7 (28.0%)	2 (8.0%)
Grade 5			
control (<u>n</u> =8)	2 (25.0%)	5 (62.5%)	1 (12.5%)
experiment (<u>n</u> =4)	0 (00.0%)	4 (100.0%)	0 (00.0%)
Grade 6			
control (<u>n</u> =5)	2 (40.0%)	3 (60.0%)	0 (00.0%)
experiment (<u>n</u> =5)	2 (40.0%)	3 (60.0%)	0 (00.0%)
Combined Grade Levels			
control (<u>n</u> =69)	36 (52.2%)	30 (43.5%)	3 (4.3%)
experiment (<u>n</u> =62)	31 (50.0%)	28 (45.2%)	3 (4.8%)

At grade four, students from the control group had more students scoring on or above grade level in reading. Sixty-four percent of the students who received Reading Recovery instruction were reading below grade level.

The sample size for fifth grade was small. Only two systems returned questionnaires, four from one system and

eight from the second. Of the questionnaires returned, 25% of the control group fell in the category marked "below grade level." All other students were reading on or above grade level.

Grade six had the smallest sample size of any group. All questionnaires were from the same system. The control and experimental groups performed at exactly the same level.

When the scores from all grades were combined, there appeared to be no difference in the two groups. Each group had nearly half of their students performing below grade level, nearly 45% performing on grade level, and nearly 5% of their students performing above grade level.

Question Three

The third question teachers answered was, "Has this child attended special classes in reading this year such as Title I or Special Education? Do not consider speech (articulation) as special classes." Table 4-7 summarizes teacher responses. The intent of this question was to determine if Reading Recovery "recovers" students from being referred for future reading referrals.

Table 4-7

Teacher Questionnaire Responses to Question Three

	<u>Referred for Special Classes</u>	
	Yes	No
Grade 3		
control (<u>n</u> =28)	12 (42.9%)	16 (57.1%)
experiment (<u>n</u> =27)	8 (29.6%)	19 (70.4%)
Grade 4		
control (<u>n</u> =28)	4 (14.3%)	24 (85.7%)
experiment (<u>n</u> =25)	2 (8.0%)	23 (92.0%)
Grade 5		
control (<u>n</u> =8)	0 (00.0%)	8 (100.0%)
experiment (<u>n</u> =4)	0 (00.0%)	4 (100.0%)
Grade 6		
control (<u>n</u> =5)	2 (40.0%)	3 (60.0%)
experiment (<u>n</u> =5)	0 (00.0%)	5 (100.0%)
Combined Grade Levels		
control (<u>n</u> =69)	18 (26.1%)	51 (73.9%)
experiment (<u>n</u> =61)	10 (16.4%)	51 (83.6%)

There appears to be no substantial differences in the percentages of students referred for special classes. In fact, nearly 25% of each group or less was referred for special reading classes in grades three through six. A complete list of all questionnaire responses can be found in Appendix F.

Conclusions

The problem investigated in this study was whether Reading Recovery instruction for first graders would show significant difference from the students who did not receive this instruction. There is a plethora of literature available to confirm or contest this question. Many studies were available supporting the Reading Recovery method as a means to recover first graders from a life of reading failure. There were, however, many references where the program did not meet school district expectations.

The conclusions based upon the analysis of the data, however, show that there was no significant difference in sustained gains for those receiving Reading Recovery instruction than those who were referred for testing for the program, but because of limited number of students served, did not receive the instruction. Not only was there no sustained gains in reading, there was no significant difference in standardized test scores taken at the second grade level, only one year out of the program.

Attempts were made to collect as much data as possible. District-level supervisors were asked to search all schools within their district for the names of the students selected. Mobility (from one school within the district to another) was not considered an exclusionary factor in this study. However, one major problem with collecting the data for this study was the large number of students who no longer were enrolled in the district in which they received Reading Recovery instruction.

The findings of this study indicate the control group was not adversely affected by not receiving Reading Recovery instruction. This was evidenced by the lack of significant difference at the $p < .05$ level of confidence on a t -test for all grades examined and when the total scores were combined for analysis.

Teacher questionnaires showed the control group did as well reading on or above grade level as the experimental group and were not referred to special reading classes at any higher rate than the experimental group.

Recommendations

An analysis of the data does not support the use of Reading Recovery over other means of improving reading instruction for first grade students. The following recommendations are being made as a result of the study:

1. It is recommended that replication of this study be administered with other populations.
2. It is recommended that replication of this study be administered comparing the Reading Recovery program to a variety of reading programs such as Success For All.
3. It is recommended that this study be administered with larger numbers in the sample.
4. It is recommended that the implications of this study be made available to teacher institutions for research.

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List of References

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Appendices

Appendix A
Reading Recovery Selection Sheet

x 20%

List bottom 20% of first grade cohort in rank order from lowest to highest as determined on Reading Recovery™ Ranking Form

[illegible]

Appendix B
Letters of Permission

1920 Claymont Drive
Clarksville, TN 37040
May 15, 2000

Dear Ms. _____:

I am a Title I Supervisor with the Clarksville Montgomery County School System and an Ed.S. candidate at Austin Peay State University. I am preparing a field study research project to be completed this spring. The research I am planning involves evaluating the sustained gains for students who had Reading Recovery lessons. My goal is to include data from ten mid-state school systems for students who are currently in grades three, four, five, and six.

The procedure will be as follows:

1. Five school systems will be randomly drawn for each targeted grade level from the possible pool of ten systems.
2. Two randomly selected Reading Recovery teachers from each of the selected school systems will be drawn for a total of ten teachers.
3. Each of these ten teachers will provide the Reading Recovery selection sheet for the targeted year.
4. Four randomly selected students will be drawn from the Reading Recovery selection sheet. This will provide a list of 40 Reading Recovery students from five systems.
5. An equal number of students will be randomly selected for a control group. These students will will be drawn from students who scored similarly to those selected for the experimental group based on scores from the Reading Recovery selection sheet.
6. For each randomly selected student, their 1999 TerraNova reading comprehension score will be included for a group mean.
7. For each randomly selected student, their current teacher will be given a three question survey regarding

the student's reading ability.

I am requesting permission to:

- 1) Meet with selected Reading Recovery teachers to randomly draw student names for the study.
- 2) Conduct a records review of students in your system.
- 3) Give the questionnaire to a very limited number of teachers.

All the data collected will be held in the strictest confidence. No student, teacher, school or school system names will be recorded or used in this study. All data will be number coded to protect this information. To further protect the identity of all participants, an equal number of student scores will be taken from five school systems for each of the four grades studied.

This research study should be beneficial to your system. The results will be provided for further evaluation to the systems participating in the study.

I look forward to hearing from you.

Sincerely,

Michael Shoulders
Clarksville-Montgomery County Schools
W: (931) 648 - 5653
F: (931) 648 - 5654

April 3, 2000

Mr. Michael Shoulders
Supervisor Title I
Learning Center

Dear Mr. Shoulders

Your research, survey and/or research project titled **Long-Term Effectiveness of the Reading Recovery Program**, has been approved by the research committee. The date of approval was **March 29, 2000**

Now that you have approval from the research committee, you may contact the principal for approval. According to Board Policy File IFA, the principal has the final authority and responsibility for approving or disapproving research conducted in his/her building.

Please read the **Research Policy and Procedures Handbook** for all information concerning research in the Clarksville-Montgomery County Schools.

If you have questions, please call my office at (931) 920-7813.

Sincerely,



Frank M. Hodgson

cc: Research Committee
File

Appendix C

Checklist for Research Involving Human Subjects

**AUSTIN PEAY STATE UNIVERSITY INSTITUTIONAL
REVIEW BOARD (APIRB) APPLICATION FOR PROJECT
APPROVAL**

This form has been designed to provide the APIRB with the information it needs to evaluate your project. Please complete each item carefully. Items that sometimes cause difficulty are clarified on the reverse side of this form.

1. **TITLE OF PROJECT:** *Long-Term Effectiveness of the Reading Recovery Program*
2. **PRINCIPAL INVESTIGATOR(s):** Michael Shoulders,
Education Department, (931) 552-4538, shouldem@k12tn.net
3. **FACULTY SUPERVISOR:** Dr. Ann Harris, Education
Department, (931) 221 - 7757, HarrisA@apsu01.apsu.edu,
FAX: (931) 221 - 6306
4. **SOURCE OF FUNDING FOR THE PROJECT:** NONE
5. **PURPOSE OF THE INVESTIGATION:** The purpose of this research study will be to make a comparison of long-term gains of Reading Recovery students compared to a control group. Proponents of the Reading Recovery method believe the program recovers students from a life of reading difficulty and that once students have had Reading Recovery training they never will need additional reading services such as Title I or Special Education. This method of reading instruction, though, is extremely costly and time consuming. Many systems refuse to use this method for three reasons: it is cost prohibitive, time consuming, and may not be able to sustain a student's ability to remain on grade level for reading. The following questions will be addressed in this study:
 - a. To what extent do Reading Recovery students score above non-program students in grades two through five?
 - b. To what extent do Reading Recovery students receive referral to remedial programs or are retained in grades 2-5 when compared to non-program students?
 - c. To what extent do Reading Recovery students maintain their reading gains or make continuous progress across years?

6. THIS RESEARCH IS BEING CONDUCTED TO FULFILL REQUIREMENTS FOR A GRADUATE DEGREE. YES X NO

7. DESCRIBE WHO PARTICIPANTS WILL BE, HOW PARTICIPANT(S) WILL BE RECRUITED, THE NUMBER AND AGE OF THE PARTICIPANTS AND ANY PROPOSED COMPENSATION. Reading Recovery teachers will provide a list of possible names for an experimental and control group for students currently in grades three, four, five, and six. A random drawing will be made to select the students for each group. The primary research will consist of records reviews. School district contacts from the participating school systems will be asked to provide 1999 TerraNova reading comprehension percentile scores for selected students and to provide classroom teachers of the selected students with a two part survey. Classroom teachers will complete the two part questionnaire. Students will not be questioned in this study. Schools systems agreeing to participate in the study will be given copies of the final project results. Individual participants will not be compensated for their involvement in this study.

8. DESCRIBE THE RESEARCH PROCEDURES IN NON-TECHNICAL LANGUAGE:

- a. Five school systems will be randomly drawn for each targeted grade level from a possible pool of ten systems.
- b. Two randomly selected Reading Recovery teachers from each of the selected school systems will be drawn for a total of ten teachers per grade level studied.
- c. Each of these ten teachers will provide the Reading Recovery Observation Survey for the targeted year. The Reading Recovery Observation Survey is an instrument used to record an entry score for students being considered for Reading Recovery instruction. There are six parts to the survey and each part's score is recorded as a stanine. The six scores are added for a final score. Students selected for Reading Recovery instruction usually score between six and eight.
- d. Four randomly selected Reading Recovery students will be drawn from this list. The remaining students will be randomly drawn and listed to use in case students from the initial group have moved or have been retained.

- e. The same process will be followed for the control group. This list will be drawn from students who scored similarly to those selected for the experimental group based on scores from the Reading Recovery observation survey.
- f. The two lists of students will be given to the system's contact person. The contact will begin at the top of the list containing the names of students who have had Reading Recovery and identify the first four names of students who are still attending school in the school system. For each student selected for the experimental group, the contact will select a name for the control group. The selection will be based on an identical or similar score from the Reading Recovery Observation Survey and if the student is still enrolled in the system.
- g. The contact person will place the names of the students on sticky notes and affix each of the stickies to a "Teacher's Questionnaire" form. The contact will circle the students' grade levels, fill in the national percentile scores, and answer the question, "Did this child receive Reading Recovery instruction in first grade?"
- h. The system contact will identify the student's current teacher and provide the teacher with an envelope containing an informed consent and a questionnaire.
- i. The teacher will complete questions two and three of the form, remove the sticky note identifying the student's name, and return the form to the system contact.
- j. The system contact will collect all 16 forms and mail them to the researcher.

The "Teacher's Questionnaire" and school system contact letter are attached.

9. POTENTIAL BENEFITS AND ANTICIPATED RISK: A cost effectiveness study will give a school system a better view as to Reading Recovery's worth to that school system. If the students' academic gains are sustained through the elementary years, Reading Recovery may be seen as a viable option for school systems. There are no known risks for participating in this study.

10. DESCRIBE THE INFORMED CONSENT PROCESS. INCLUDE A COPY OF THE INFORMED CONSENT DOCUMENT. Once the

experimental and control groups have been determined, their current classroom teacher will be identified. They will be asked to read the "Information for Participation in a Research Study" (informed consent) form. Completion and return of the survey constitutes their informed consent to participate in the project.

This is to certify that the only involvement of human participants in this research study will be as described above.

Michael Dwayne Shoulders
Principal Investigator's Signature

Dr. Ann Harris
Faculty Supervisor's Signature

Austin Peay State University
Institutional Review Board

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February 23, 2000

Michael Shoulders
343 Pageant Lane
Clarksville, TN 37040

RE: Your application dated February 22, 2000 regarding study number 00-038:
Long-Term Effectiveness of the Reading Recovery Program (Austin Peay State
University)

Dear Mr. Shoulders:

I have reviewed your request for expedited approval of the new study listed above. This type of study qualifies for expedited review under FDA and NIH (OPRR) regulations.

This is to confirm that I have approved your application through one calendar year. You must obtain informed consent from teachers; however, signed written consent is not required. Informed consent from students is not required as this is a review of records without student names attached. This approval is subject to APSU Policies and Procedures governing human subjects research. The full IRB will still review this protocol at the next meeting (2-28-00) and reserves the right to withdraw expedited approval if issues are raised during their review.

You are granted permission to conduct your study as described in your application effective immediately. The study is subject to continuing review on or before February 23, 2001, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Sarah Lundin-Schiller or me (931-221-7881; fax 931-221-7304; email: grants@apsu.edu) if you have any questions or require further information.

Sincerely,



Ms. Linda Freed

Manager, Office of Grants and Sponsored Programs

cc: Dr. Ann Harris
Dr. Frank Hodgson

Appendix D
Teacher's Questionnaire

Teacher's Questionnaire

Student's Grade level during 1999-2000 School year: 3 4 5 6

Student's National % score for Reading Composite on the 1999 TerraNova: _____

Directions: For the identified student, please answer questions 2 and 3 by circling the most appropriate answer. When you are done, remove and discard the sticky containing the student's name and return the form to your school system's contact. Thank you for your help in this study.

1. Did this child receive Reading Recovery instruction in first grade?

Yes

No

2. Currently, is this child reading:

Below Grade Level

On Grade Level

Above Grade Level

3. Has this child attended special reading classes this year such as Title I or Special Education? Do not consider speech (articulation) as special classes.

Yes

No

Appendix E
Informed Consent

Information for Participation in a Research Study
AUSTIN PEAY STATE UNIVERSITY
Title of Project: Long-Term Effectiveness of the
Reading Recovery Program

You are being asked to participate in a research study. Please read the following material carefully. It describes the purpose of the study, the procedures to be used, risks and benefits of participation, and what will happen to the information that is collected from you. You may ask the researchers listed below about this study or you may call the Office of Grants and Sponsored Research, Box 4517, Austin Peay State University, Clarksville, TN 37044, (931) 221 - 7881 with questions about the rights of research participants.

1. The purpose of this research study will be to make a comparison of long-term gains of Reading Recovery students compared to a control group.
2. You will be asked to fill out a three part questionnaire on a student currently in your classroom. When the questionnaire is completed, you will give it back to the administrator for tabulation. Please do not put any identifying marks, the student's name, or your name on this form.
3. Your participation is completely voluntary. There are no known risks for participating in this study. If you feel uncomfortable at any time during the study, you may discontinue your participation.
4. A cost effectiveness study will give a school system an informed view as to Reading Recovery's worth to that school system. If the students' academic gains are sustained through the elementary years, Reading Recovery may be seen as a viable option for school systems.
5. The data collected will be analyzed and stored by the examiner for future research. It may be used for institutional decisions. Since your responses are anonymous and will be added to data from four other systems, it will be impossible to identify the participants of this study. If you would like a summary of the findings of this study, you may contact: Michael Shoulders or Dr. Ann Harris.
6. You may terminate your participation at any time without penalty or prejudice.
7. Completion and return of the survey constitutes your informed consent to participate in the project.

Michael Shoulders
Graduate Student in Education
343 Pageant Lane
Clarksville, TN 37040

Dr. Ann Harris
Department of Education
Austin Peay State University
Clarksville, TN 37044

Appendix F
Experimental Group and Control Group
Raw Scores

Student ID	System #	TerraNova Reading Composite (in %)	Classroom Reading Level	Attending Special Reading Classes?
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Grade 3 Control Group

1	2	9	below	yes
2	2	9	below	yes
3	2	29	below	yes
4	2	17	below	yes
5	2	47	on	no
6	2	37	on	no
7	2	80	on	no
8	4	49	below	yes
9	4	18	below	yes
10	4	6	below	yes
11	4	82	on	no
12	4	61	below	yes
13	4	17	below	yes
14	4	99	on	no
15	7	34	below	no
16	7	38	below	yes
17	7	87	on	no
18	7	18	on	no
19	7	49	below	no
20	7	17	below	yes
21	7	17	below	yes
22	7		above	no
23	8	66	on	no

(data continues)

Student ID	System #	TerraNova Reading Composite (in %)	Classroom Reading Level	Attending Special Reading Classes?
24	8	32	on	no
25	8	77	on	no
26	8	38	below	no
27	8	52	below	no
28	8	31	on	no

Grade 3 Experimental Group

29	2	28	below	no
30	2	43	below	
31	2	49	on	no
32	2	43	on	yes
33	2	39	on	no
34	2	55	on	no
35	2	58	on	no
36	2	75	on	no
37	4	72	below	yes
38	4	88	below	yes
39	4	35	on	yes
40	4	42	on	no
41	4	27	below	no
42	4	40	below	no
43	4	4	below	no
44	4	38	on	no
45	7	19	below	yes
46	7	18	below	no

(data continues)

Student ID	System #	TerraNova Reading Composite (in %)	Classroom Reading Level	Attending Special Reading Classes?
47	7	17	on	no
48	7	31	on	yes
49	7	70	above	yes
50	8	54	on	no
51	8	49	below	no
52	8	49	below	yes
53	8	70	on	no
54	8	82	on	no
55	8	30	below	no
56	8	32	below	no

Grade 4 Control Group

57	2	39	below	no
58	2	58	below	no
59	2	63	below	no
60	2	3	below	yes
61	2	4	below	yes
62	2	17	below	yes
63	2	75	on	no
64	2	41	on	no
65	2	41	on	no
66	6	74	on	no
67	6	2	below	yes
68	6	14	below	no
69	6	31	below	no

(data continues)

Student ID	System #	TerraNova Reading Composite (in %)	Classroom Reading Level	Attending Special Reading Classes?
70	6	14	below	no
71	6	22	below	no
72	6	36	on	no
73	7	54	above	no
74	7	48	below	no
75	7	55	below	no
76	7	30	below	no
77	7		on	no
78	8	72	on	no
79	8	20		
80	8	68	on	no
81	8	13	below	no
82	8	30	on	no
83	8	75	on	no
84	8	36	below	no
85	8	64	on	no

Grade 4 Experimental Group

86	2	29	below	no
87	2	21	below	no
88	2	17	below	yes
89	2	74	on	no
90	2	67	on	no
91	2	41		
92	6	79	above	no

(data continues)

Student ID	System #	TerraNova Reading Composite (in %)	Classroom Reading Level	Attending Special Reading Classes?
93	6	59	below	no
94	6	14	below	no
95	6	39	below	no
96	6	28	below	no
97	6	48	below	no
98	6	49	on	no
99	6	15	below	no
100	7	30	below	no
101	7	79	on	no
102	7	22	below	no
103	7	16	below	yes
104	7		below	no
105	7		above	no
106	8	48	on	no
107	8	65	below	no
108	8	15		
109	8	39		
110	8	23	below	no
111	8	85	on	no
112	8	64	on	no
113	8	46	below	no
<u>Grade 5 Control Group</u>				
114	2	66	on	no
115	2	53	on	no

(data continues)

Student ID	System #	TerraNova Reading Composite (in %)	Classroom Reading Level	Attending Special Reading Classes?
116	2	93	on	no
117	2	81	on	no
118	2	46	below	no
119	2	28	below	no
120	5	37	on	no
121	5	66	above	no

Grade 5 Experimental Group

122	2	36	on	no
123	2	70	on	no
124	5	60	on	no
125	5	29	on	no

Grade 6 Control Group

126	2	58	below	no
127	2	12	below	yes
128	2	84	on	yes
129	2	86	on	no
139	2	31	on	no

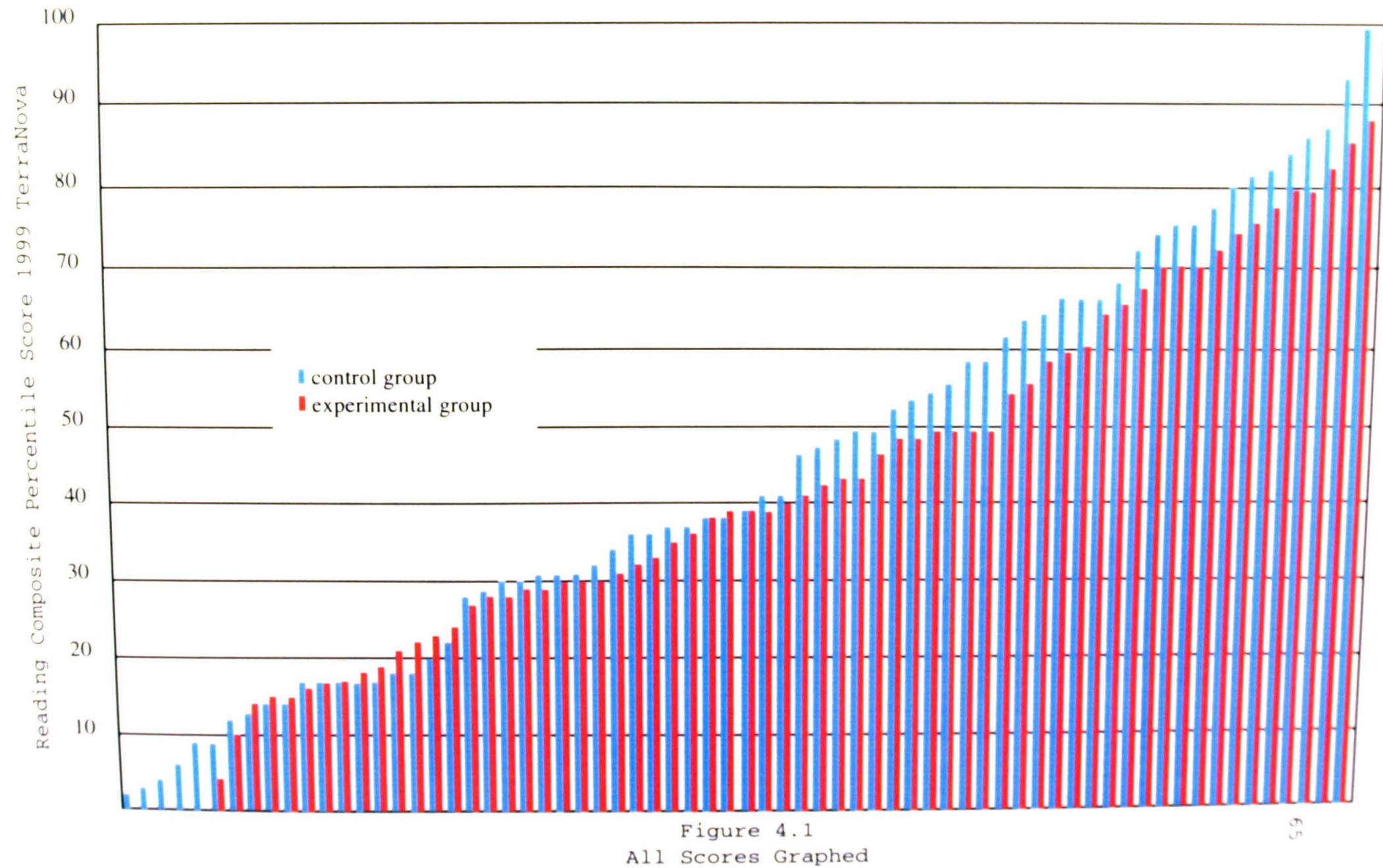
Grade 6 Experimental Group

140	2	77	on	no
141	2	30	below	no
142	2	33	on	no
143	2	24	below	no
144	2	10	on	no

(data continues)

<u>Grade 3</u>	<u>Control</u>	<u>Experimental</u>
Mean:	41.3333	44.8929
Standard Deviation:	26.5503875	20.9007164
<u>Grade 4</u>		
Mean:	39.2500	42.7692
Standard Deviation:	23.626139	22.7443315
<u>Grade 5</u>		
Mean:	58.7500	48.7500
Standard Deviation:	21.9983766	19.4143418
<u>Grade 6</u>		
Mean:	54.2000	34.8000
Standard Deviation:	32.5299862	25.1932531
<u>All Scores Combined</u>		
Mean:	43.4705882	43.4603175
Standard Deviation:	25.6512026	21.6100525

Appendix G
All Scores Graphed



VITA

Michael Dwayne Shoulders was born two minutes before his twin sister, Patricia, in Fort Meade, Maryland on August 19, 1954. Being an army brat, he attended ten schools, including three in Germany, before graduating from Northwest High School on May 21, 1972. He entered Austin Peay State University in September, 1972 and earned a Bachelor of Science in Elementary Education degree on June 4, 1976. He began teaching for the Clarksville-Montgomery County School System in August of 1976.

He continued his education at Austin Peay State University and received his Master of Arts in Education degree on August 21, 1980. He received his Administration Endorsement in 1987.

He became an elementary supervisor for the Clarksville-Montgomery County School System on September 6, 1989. He is presently serving as a Title I supervisor, a position he has held since July 1, 1996.

His first children's book, "V is for Volunteers - a Tennessee Alphabet," has been accepted for publication by Sleeping Bear Press. From the Appalachian Mountains to the zebra swallowtail, children can learn interesting fact about the Volunteer state.