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AN EXAMINATION OF READING-ACHIEVEMENT RETENTION OVER THE SUMMER MONTHS FOR LOW-ACHIEVING STUDENTS WHO RECEIVED REMEDIAL INSTRUCTION DURING THE SCHOOL YEAR

Wayne State University  PH.D.  1981

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AN EXAMINATION OF READING-ACHIEVEMENT RETENTION OVER THE SUMMER MONTHS FOR LOW-ACHIEVING STUDENTS WHO RECEIVED REMEDIAL INSTRUCTION DURING THE SCHOOL YEAR

by

Lindson Feun

DISSERTATION

Submitted to the Office for Graduate Studies, Graduate Division of Wayne State University, Detroit, Michigan in partial fulfillment of the requirements for the degree of

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APPROVED BY:

[Signatures]

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CHAPTER I
INTRODUCTION
Background of the Problem

The enactment of Title I of the Elementary and Secondary Education Act in 1965 provided federal assistance to school districts based on the number of low-income children residing in the districts. In passing the act, Congress made the following Declaration of Policy:

In recognition of the special educational needs of children of low-income families and the impact that concentrations of low-income families have on the ability of local educational agencies to support adequate educational programs, the Congress hereby declares it to be the policy of the United States to provide financial assistance to local educational agencies serving areas with concentrations of children from low-income families to expand and improve their educational programs by various means which contribute particularly to meeting the special educational needs of educationally deprived children (NIE, 1977a, p. 8).

Section 141 of the act expanded upon the Declaration of Policy by requiring school districts to design special programs of sufficient quality so as to ensure progress, to supplement rather than supplant non-federal funding, and to operate at a higher level of funding than that which is allocated to non-Title I students. Section 141 also requires that services provided by State and local funds be of a comparable nature in Title I and non-Title I schools (ibid., p. 8).

In 1974 Congress extended and modified the Elementary and Secondary Education Act (ESEA) of 1965 under Public Law 93-380 and other federal programs, including the Education of the Handicapped Act, the Adult Education Act, Indian education, and the emergency school-aid program. The law also directed various federal agencies to provide additional
information by conducting research pertaining to elementary and secondary education.

Research has been conducted on the feasibility of reformulating the funding criteria of the original act to provide Title I funds on the basis of low achievement, rather than the number of low-income families. The issues which must be resolved before achievement-based funding can be implemented include the following:

1. How to define low achievement for the purposes of fund allocation.
2. Whom to list in order to establish counts of low-achieving children.
3. How to guarantee the accuracy of the data used for funds allocation (NIE, 1977b, pp. v-vi).

For now, however, a district receives Title I funds based on its number of "formula eligibles" or a count of low-income children within its boundaries. "Within a Title I district, a school is eligible for funds based on the number or proportion of low-income children residing in its attendance area. Any school above the district average is eligible. At the student level, however, the basic eligibility criterion is educational. Children in Title I schools who are low achievers are eligible for Title I programs." (NIE, 1977c, p. 9)

Students in Title I districts appear to be concentrated in grades 1-6, with similar proportions in each of these grades. Very few Title I students are in junior or senior high school, since school districts tend to use their funds for developing basic skills in the elementary grades. There is a significantly higher percentage of minority-group children in compensatory education programs than there is in total
enrollment in Title I districts (NIE, 1977d, p. xviii).

Many compensatory education students receive instruction in more than one subject area. The average amount of time spent in compensatory instruction is five and one-half hours per week (ibid., p. xix).

In administering the Title I program, the federal government's primary functions are to establish the rules and regulations under which the program operates and to review the actions of State Educational Agencies (SEAs) and Local Educational Agencies (LEAs). State governments are responsible for helping LEAs understand the Title I rules fully and for overseeing district practices to ensure that funds are used as Congress intended (NIE, 1977a, p. v). LEAs are expected to:

1. Identify eligible schools in the district by using a poverty criterion.
2. Select target schools (that is, decide which of the eligible schools will, in fact, receive Title I services).
3. Distribute services among targeted schools.
4. Identify the categories of children to be served in target schools.
5. Select from those eligible the students who will, in fact, be served (NIE, 1977e, p. 5).

In addition to administering Title I programs, SEAs in one-third of the states operate compensatory education programs with state funds (NIE, 1977a, p. 5). State compensatory education programs generally complement Title I, either by extending compensatory services to more students or by providing additional services to children in Title I programs. Most state programs operate smoothly in conjunction with Title I and rely on its administrative framework and staff support (ibid., p. vii).
Allocations are made to districts by either a formula or a competitive grant system. The majority of the states use various economic-disadvantage criteria, some of which are very similar to the Title I criterion; however, two states, Michigan and New York, allocate funds solely on the basis of achievement criteria (ibid., p. 60).

In Michigan, districts presently receive compensatory education funds based on the achievement scores of their students on the Michigan Educational Assessment Program (MEAP). The Michigan Compensatory Education program has been funded since 1968 under Article 3, initially referred to as Section 3 and later Chapter 3, of the State School Aid Act. During the first year of operations, school districts were allocated funds based on a scale which measured the "degree of deprivation" of schools and children within schools, a scale derived from the Title I framework in Michigan. The scale involved a consideration of:

1. ADC programs
2. broken homes
3. underprivileged children
4. substandard housing
5. density of school-age children in the district

In 1971-72 the distribution of State funds was determined by student performance on the Michigan Educational Assessment Program (MEAP) which was initiated by the State Board of Education and initially funded by the legislature through Act 307 of the Public Acts of 1969 and later under Act 38 of the Public Acts of 1970. The MEAP was designed to assess minimal performance objectives in reading and mathematics using norm-referenced measures originally, and later, criterion-referenced test items. The objectives were developed by educators throughout the
State and represent a set of minimal expectancies applicable to all beginning 4th-, 7th-, and recently, 10th-grade students in the State (MDE, 1973).

Depending on the funds available each year, the criterion was established for determining the eligibility of a school district for the program based on the percentage of students achieving a criterion percentage of the objectives on the MEAP. The test scores from the two previous years were aggregated for making the determination (Strong, Note 1).

Furthermore, since 1971-72, Michigan's Article 3 program has been based on an accountability model in which school districts are held accountable for student achievement (Sie, Note 2). The focus of the Article 3 program is in the areas of reading and math. Guidelines were established by the Michigan Department of Education for the allocation of funds to school districts:

1. Each school must have available a list of such pupils and a description of the delivery-system change provided for such pupils.

2. Each school must convene a committee composed of parents, teachers, and an administrator(s) for the purpose of determining the change in delivery systems.

3. Each school must examine the following elements of the delivery system for the Chapter 3 project and modify one or more of the elements. All of the changed elements should be accompanied by documentation to show the changes from the previous practice.

   a. Organizational structure which represents the way in which people and decision-making authority are arranged in a particular setting to provide necessary services to clients. This includes staffing patterns and staff utilization.

   b. Methodology which speaks to the specific materials and/or procedures which are used by personnel that can be documented as having direct results on clients.
4. Each school must provide for periodic or interim evaluation of student progress and an interim re-examination of the effectiveness of the changed delivery system.

5. Each participating school district must file a plan for monitoring and documenting the implementation of the criteria by each participating school within the district.

6. Each school district must consider the use of specific performance objectives and criterion-referenced tests as a first step in a systematic approach to diagnostic prescriptive teaching.

7. A district receiving monies under Chapter 3 may use these monies in any manner which, in the judgment of its board of education and its staff, will contribute significantly toward substantial improvements in the basic cognitive skills of the pupils. These uses may include but are not limited to the following:

   a. Employment of additional personnel
   b. Purchase of instructional devices and other aids
   c. Leasing of portable classrooms
   d. Contracting with a public or private agency, a group of non-employees
   e. Providing in-service training for training for teachers and other personnel
   f. Provision of adequate nutrition and health care to students
   g. Provide in-service training for Chapter 3 parents of student participants in the field of reading and math (Jeanmarie, 1978, p. 38).

To ensure school districts provide remedial assistance to students who exhibit serious deficiencies in basic cognitive skills, additional guidelines were established for the selection of participating students under Rule 2, R388.222 of the State Aid Act:

1. Pupils shall be selected from each of the grades K-6 on the basis of having extraordinary need for special assistance in the basic cognitive skills.

2. Pupils in grades 2-6 shall be considered to have extraordinary need if they meet any of the following criteria:
a. They score one or more years below grade level in computation or communication skills on a standardized achievement-test instrument administered between September 1 of the previous year and October 31 of the year of selection.

b. They demonstrate mastery of 40% or fewer of the objectives on the reading or mathematics tests of the Michigan educational assessment battery for the previous school year.

c. If neither criteria a or b is available, they score one or more years below grade level on a standardized achievement-test instrument administered prior to September 1 or during the previous school year.

d. If a, b, or c is not available, it is the attested judgment of a school teacher or school official that the pupil is in need of substantial improvement in basic skills.

3. Pupils in grades K-l shall be considered to have extraordinary need if it is the attested judgment of a school teacher or school official that the pupil is in need of substantial improvement in readiness skills.

4. The total number of pupils identified to be funded as program participants shall not exceed the number determined by Chapter 3, section 33(c) of the act.

5. An attested list of pupils identified as program participants shall be available in the local school district office following the fourth Friday after the official, membership-count date.

**Rationale for the Study**

In evaluating the effects of Title I on student achievement, early evaluation reports by the American Institute for Research indicated that school districts were not meeting the criterion for success, which was one month of growth for each month of the program, as set by the Office of Education. However, some states, such as Michigan, have achieved some success (ibid., p. 27). For example, in 1972 students in Michigan's Title I programs achieved average gains of 1.3 months for
every month of instruction in reading and math. After a painstaking search, the American Institute for Research picked a few of the best projects nationwide for a series called "It Works." Even some of the districts selected were unable to meet the month-for-month standard (RER, 1976, p. 4).

The criterion for success was derived from the underlying assumptions of the grade equivalent unit (GEU), a unit of measurement associated with standardized tests. The GEU for a specific raw score represents the year and month of school for which the raw score is the median. This unit of measurement is calibrated during the testing session(s) of the norming phase and then extrapolated for the other months of the school year. The GEU is incremented on the basis of one-tenth of a unit for each month of school. In other words, the GEU can be used to indicate a rate of progress, i.e., one month of growth for each month of instruction.

Although the grade equivalent unit is an established unit of measurement, it has certain limitations which reflect on the criterion for success used by Title I programs. An underlying assumption to the GEU is that growth is linear, i.e., students progress at the same rate each month. This assumption has been questioned by many educators. However, in the norming process, test publishers have structured the process to produce the GEU, as well as other units of measurement.

Subsequently, the criterion for success, one month of growth for each month of instruction, is at least partially substantiated since test publishers have accepted the concept of the grade equivalent unit. Experience has indicated the concept has certain limitations, and thus,
the criterion for success has similar limitations.

In 1976 the General Accounting Office issued a report based on a survey of reading programs in fifteen school districts in the 1972-73 school year. Essentially, the report concludes that the gap between the achievement level of the Title I children and non-Title I children generally increases as Title I students continue in the program (ibid., p. 5). In other words, non-Title I students retained more reading skills over the summer months than students in Title I programs. As a result, the latter group of students need to achieve more than the criterion for success, one month of growth for each month in the program, just to keep up with non-Title I students year after year.

Two recent studies completed by the Educational Policy Research Center at Stanford Research Institute provide convincing evidence that disadvantaged Title I students were indeed making the month-for-month reading gains. The first study indicated that schools throughout four states were meeting the criterion for success. The researchers calculated average monthly gains from 283 state reports representing over three million students in all twelve grades and determined that the average monthly gains were close to a 1.1 month gain. A further analysis of three additional states, California, New York, and Michigan, indicated that the achievement gain obtained during the school year was being neutralized by the summer vacation months. Since disadvantaged Title I students were losing more during the summer, the study postulated that the students needed to achieve at the rate of 1.1 or 1.2 months per month during the school year just to keep up with non-Title I students (ibid., p. 5).
A second study by the Educational Policy Research Center analyzed data from a large midwestern city's compensatory education program and from four California junior-high school compensatory programs. The researchers concluded that, when the summer months were included in an evaluation, achievement gains are considerably reduced. The study recommended that school districts "test minimally" each fall and "preferably each fall and spring," because this would "provide the capability for estimating the extent to which school-year gains are sustained through the following summer." (RER, 1977, p. 8) With the data collected both times, the study suggested that school districts should compare both fall-to-spring and fall-to-fall achievement (ibid., p. 8).

Scope of the Study

The two studies by the Educational Policy Research Center indicated the importance of considering the summer vacation months in an evaluation of Title I programs. Both studies examined data in which student achievement was offset by the lack of instruction during the summer. The focus of both studies was directed at programs supported by Title I funds.

In states which provide additional services that complement services provided by Title I funds, the impact on student achievement loss during the summer months may produce a different pattern.

One Michigan school district, which has received Title I funds for the past 13 years, recently has been granted State compensatory-education funds under Article 3 and Section 48 of the State
Aid Act. The district, the second largest in Oakland County, has a student population of approximately 16,000 and a teaching staff of 748. It is part of the southeast Michigan metropolitan area.

"The district can be considered typical in the state of Michigan from several standpoints. The student-achievement test scores on the Michigan Educational Assessment Program have paralleled the state averages over the nine years of the assessment program. Ages of the teaching staff range from 22 years to 65 years old. The teaching staff has a median age of 34 years, and no single age category comprises more than 7.8% of the entire group. The student population has recently peaked, and the district has begun to experience a slight enrollment decline. The decline in student enrollments is forecasted to become much more severe in future years. Since the school district has demographic characteristics in common with many Michigan districts, the findings of this study will be applicable beyond the confines of the subject of the study." (Heitzeg, Note 3)

Title I services have been administered by a department within the district for the past 13 years. In addition to offering consultant help to classroom teachers, district reading specialists, who all have at least a master's degree in reading, work with small groups of children outside of the classroom. These children are selected by the building staffs because of their slow progress in reading. The criterion for assistance from reading specialists is two years below grade level, as measured by the Gates-McKillop Reading Diagnostic Tests. The students constitute the bottom 3% of the student population (500 students out of 16,000) in terms of reading skills when entering the program. Included
in this group is a large percentage of students at the lower end of the intelligence quotient (70-90). Students are seen four days each week in the fourteen Title I elementary buildings, where reading specialists are paid mostly by federal funds. In the remaining ten elementary buildings, where children are seen only two days each week, programs are funded completely by the district (Feun, Note 4).

Services provided by the department include:

1. Diagnosis of children's reading needs.
2. Small-group instruction outside the regular classroom.
3. Consultant help to classroom teachers relative to reading management, diagnosis, grouping, instruction, and evaluation of reading programs.
4. Reading workshops for district teachers and aides.
5. Consultations with individual parents regarding their children's reading programs.
6. Presentations at PTAs to explain reading programs to groups of parents.
7. Meeting with secondary teachers to coordinate the total, district reading program (Messer, Note 5).

The office in the district that administers the Article 3 program consists of a supervisor, two teacher consultants, and a program evaluator. The staff was formed in the fall of 1977 to provide guidance to all of the elementary, and recently, secondary buildings involved in the program, to consult with the building staff, to provide inservice training to instructional aides, and to provide evaluation data.

The amount of funds allocated to each building was determined by the State formula using the test results from the Michigan Educational Assessment Program. Approximately 1,600 students were served during each of the last two years. The vast majority of buildings employed instructional aides as the foundation for their compensatory education programs. Inservice training at the district and building levels helped
prepare aides for their responsibilities. Reports from the buildings indicated that aides are generally used as second teachers, as recommended by the Report of the 1974-75 Michigan Cost-Effectiveness Study and several additional research studies. The two basic models for using aides are the tutorial and monitorial models of the pullout system. When using the tutorial method, students leave the classroom and receive supplementary or reinforcing instruction by the aides. When the latter method is used, aides supervise a teacher-planned activity in the classroom while the teacher works with the compensatory education students outside of the classroom, generally in the hallway. With both methods, the principle approach is to increase the amount of instructional time for low achievers. Reports from the buildings indicate almost all of the buildings used the tutorial method.

Significance of the Study

Both the Title I program and Article 3 program provide remedial assistance to low-achieving students. Reading specialists from the Title I program assist low-achieving students in reading who are from attendance areas which are considered economically disadvantaged. Instructional aides and classroom teachers, under the Article 3 program, assist students in reading and mathematics who are low achievers, regardless of their attendance areas. As a result, some students receive assistance from both programs.

The purpose of this study was to determine if the amount of reading instruction received by students during the school year affected summer retention. The term "amount" is defined as the presence or absence of
reading specialists, i.e., whether the reading specialists did or did not provide remedial assistance. Two groups of students were involved in the study. The first group consisted of students who received remedial assistance from instructional aides with guidance from classroom teachers in the Article 3 program. The second group consisted of students who received remedial assistance not only from instructional aides and classroom teachers in the Article 3 program, but also assistance from reading specialists in the Title I program.

By determining if there were any significant differences in the amount of student-achievement loss or gain occurring over the summer months between the two groups, inferences were made concerning the feasibility of using instructional aides to assist low-achieving students in reading rather than having reading specialists, who demand a much higher salary, work directly with students. Furthermore, reading specialists could devote more time to providing other types of services.

Assumptions and Limitations of the Study

For the purpose of this study, it is assumed that:

1. The reliability of the test items on level 1 of the Comprehensive Tests of Basic Skills has remained consistent over the four testing sessions.

2. The students in both groups participated in similar activities or had similar experiences during the summer vacation months.

3. Students in both groups did not participate in extracurricular activities during the school year that would have increased their reading abilities.

The limitations of the study are:

1. The students involved in this study were from the elementary buildings in one district.
2. The school year being studied was the first year of operation for the district in the Article 3 program.

3. Only the reading achievement scores of the students are analyzed. Measures of language skills, mathematics, social studies, science, etc. are not included in this study.

4. The criteria used to select students for the Article 3 program vary slightly from the criteria used in other districts. This will limit the degree to which the results of the study can be generalized.

5. No attempt will be made to analyze the relationship between allocation of funds in the district and student achievement.

6. Since the study focuses on the grade levels stated, the results of the study will not accurately indicate progress in other grades.

7. The selection criteria for students in the experimental group were slightly different than for students in the control group. As a result, the two groups were similar but not equivalent.

8. The actual amount of remedial instructional time provided to students in the study was not determined. As a result, this variable was not accounted for.

9. Neither the quality nor frequency of remedial services provided to both groups of students was ascertained.

10. The home and community environments of the students involved in the study were not determined, although both groups were from Title I or low-income areas.

11. The specific reading habits and patterns of the students were not examined.

12. There is very little published research information regarding the Article 3 programs at the State level.

Definitions of Important Terms

1. Pullout system: The pullout system withdraws low-achieving students from the regular classroom so they may receive special or additional instruction.

2. Tutorial method: The tutorial method of instruction is usually reinforcing or supplemental in nature.
Low-achieving students are assisted by instructional aides outside the regular classroom. The aide utilizes drill activities, games, or other methods designed to reinforce classroom instruction. When the aide assists students by conducting follow-up activities designed by the teacher, the instruction is considered supplementary.

3. Monitorial method: The aide monitors a classroom activity while the teacher works with low achievers outside the classroom. The services provided by the aide are supplementary in nature.

4. Delivery system: Delivery systems are the resources—human, financial, and physical—designed for the attainment of specific objectives and statements of expectations.

5. Criterion-referenced test (also referred to as objective-referenced test): A test designed to measure specific skills students have or have not attained. It is used for diagnostic purposes rather than to make comparisons between students.

6. Norm-referenced test: A test designed to measure a student's performance relative to the performance of other students. The data obtained is valuable for making comparisons between individuals and groups.

7. MEAP: Michigan Educational Assessment Program is a criterion-referenced measure which assesses minimal-performance objectives obtained by beginning 4th-, 7th-, and 10th-grade students.

8. CTBS: Comprehensive Tests of Basic Skills, level 1.

9. SFTAA: Short Form Test of Academic Aptitude, level 2.

10. ESS: The Expanded Standard Scores (scale scores) are produced from a single, equal-interval scale of scores across all grades for use with all levels of the CTBS. The scores are useful for measuring the amount of growth of students from the beginning of school to the end of the twelfth year, regardless of which levels of the CTBS have been administered.

11. Raw scores: The number of correct answers or responses.
Statement of Hypothesis

The principle research hypothesis of this study was students who received remedial assistance from instructional aides and reading specialists during the school year would significantly retain more reading skills over the summer months following the school year than students who received remedial assistance from instructional aides only. The null hypothesis was:

Hypothesis I

There is no significant difference in the summer retention of reading achievement between students who received remedial assistance from both instructional aides and reading specialists and students who received remedial assistance from instructional aides.

In addition to the principle research hypothesis, this study examined the reading achievement of both groups during the school year to bring the issue of summer retention into perspective. It was hypothesized that students who were serviced by both instructional aides and reading specialists would significantly achieve more reading skills during the school year than those students who were serviced by instructional aides only. The null hypothesis was:

Hypothesis II

There is no significant difference in the reading achievement obtained during the school year between students who received remedial assistance from both instructional aides and reading specialists and students who received remedial assistance from instructional aides.
Overview of Chapters I-V

The following chapter arrangement was planned.

Chapter I. INTRODUCTION
A. Background of the Problem
B. Rationale of the Study
C. Scope of the Study
D. Significance of the Study
E. Assumptions and Limitations of the Study
F. Definitions of Important Terms
G. Statement of Hypothesis

Chapter II. REVIEW OF RELATED LITERATURE
A. Information on Reading Specialists
B. Information of Instructional Aides
C. Information on the Retention of Student-Achievement Over the Summer Months

Chapter III. METHOD OF THE STUDY
A. Description of Sample
B. Description of Measurement Instruments
C. Data-Collection Procedures

Chapter IV. RESULTS
A. Data Analysis
B. Discussion of Findings

Chapter V. CONCLUSIONS AND RECOMMENDATIONS
A. Summary
B. Conclusions of the Study
C. Recommendations by the Writer
D. Implications

Appendices
A. Selected Bibliography
B. Reference Notes
C. Autobiography
CHAPTER II
REVIEW OF THE LITERATURE

In this chapter, the literature pertaining to the study was reviewed in three sections. The literature on the utilization of reading specialists was reviewed first since the students in one of the groups, designated as the experimental group, received remedial assistance from reading specialists, the independent variable of the study, and from instructional aides. In the second section, a review of the literature on the utilization of instructional aides was presented since both groups of low-achieving students involved in the study received remedial assistance from instructional aides. Finally, the literature on summer retention of student achievement was reviewed to gain an understanding of the focus of this study.

Utilization of Reading Specialists

The need for remedial reading was well substantiated in the research literature. Literally hundreds of research endeavors have been conducted to determine the causes of reading deficiencies and the remedial procedures needed to correct the deficiencies. There appears to be a general agreement among experts in the field of reading that reading difficulties must be thoroughly diagnosed before the remedial process can be implemented.

Diagnosis is an identification of weakness or strength from an observation of symptoms. It is an inference from performance. It must include an assessment of both levels of
performance (reading retardation) and manner of performance. It is concerned with determining the nature of the problem, identifying the constellation of factors that produced it, and finding a point of attack (Jeanmarie, 1978, p.20).

The diagnostic process is a systematic method of detecting the abilities and deficiencies that are facilitating or inhibiting a student's progress. The process must be directed toward formulating corrective measures or remediation. In order for remediation to be effective, diagnosis must be thorough. Bond and Tinker (1957, p. 152) list eight general principles of diagnosis:

1. A diagnosis is always directed toward formulating methods of improvement.
2. A diagnosis involves far more than appraisal of reading skills and abilities.
3. A diagnosis must be efficient - going as far as and no further than is necessary.
4. Only pertinent information should be collected and by the most efficient means.
5. Whenever possible, standardized test procedures should be used.
6. Informal procedures may be required when it is necessary to expand a diagnosis.
7. Decisions in formulating a diagnosis must be arrived at on the basis of patterns of scores.
8. A diagnosis should be continuous.

When the strengths and weaknesses of a student who appears to have a deficiency in reading are assessed, tentative hypotheses are made to further isolate the specific deficiency(ies) and the source of the deficiency(ies). Remediation steps are then implemented. In current usage remedial instruction is the form of teaching undertaken to improve abilities in which diagnosis has revealed deficient (Newman, 1969).
However, remediation or the correction of reading problems is not based on mysterious techniques but sound instructional principles which focus upon the needs of students as detected by careful diagnosis. Lipton (1970, p. 354) states:

Diagnosis is perceived in a circular and spiraling relationship to remedial strategies. Once a diagnosis is done, it is not forgotten, but is on-going and intertwined in all aspects of remediation.

Similar to diagnosis, several principles of remediation have been identified. Bond and Tinker (1957, p. 241) list nine basic principles to successful remedial programs:

1. Treatment must be based on an understanding of the child's instructional needs.
2. Remedial programs must be highly individualized.
3. Remedial instruction must be organized instruction.
4. The reading processes must be made meaningful to the learner.
5. Consideration of the child's personal worth is necessary.
6. The reading program must be encouraging to the child.
7. Materials and exercises must be suitable to the child's reading ability and instructional needs.
8. Sound teaching procedures must be employed.
9. A carefully designed follow-up program is necessary.

Although the research literature has well established the value of diagnosis and remediation, there is less agreement on the implementation of these two concepts. Traditionally, students in need of remedial assistance are removed from the regular classroom and provided individual or small group instruction by reading specialists.
or reading aides (Cohen, Intili, and Robbins, 1978). With this method of instruction, the classroom teacher makes a preliminary diagnosis based on his/her personal observations and student test scores. A more thorough diagnosis is conducted by the reading specialist who also provides remedial instruction. Some programs use reading aides to either assist or provide instruction directly to students. The emphasis in these programs is to correct reading deficiencies rather than prevent them. Furthermore, the responsibility for reading instruction tends to shift from the regular classroom teacher to the reading specialist (Robinson and Pettit, 1978).

Other types of programs have attempted to provide all remedial instruction within the regular classroom aided by a reading specialist who functions in a consultant capacity. Such authors as Rauch (1965), Robinson (1967), Mason and Palmatier (1973) suggested the reading specialist's main function should be to assist the classroom teacher rather than provide remedial instruction (Robinson and Pettit, 1978). With this type of method, the classroom teacher retains responsibility for the reading development of his/her students. In many school districts which employ reading specialists and aides, this latter method is seldom adhered to. Generally, reading specialists and aides provide some type of remediation to students outside of the regular classroom (Messer, 1970).

In addition to providing advice to classroom teachers and diagnostic and remedial assistance to students, reading specialists are asked to assume other responsibilities:

1. In-service education
2. Resource for classroom teachers
3. Coordinate summer school program for reading
4. Public relations with parents
5. Supervision of tutoring

With the diversified functions that a reading specialist can perform, the allocation of his/her time is crucial to the success of a remedial reading program. In a survey conducted by Cohen, Intili, and Robbins (1978) for the Stanford University Center for Research and Development in Teaching, 469 teachers in 46 elementary schools were sampled at random. The survey attempted to determine the organization patterns of remedial programs. The data indicated the most frequent relationship between a reading specialist and teacher was one in which selected students were instructed by the specialist outside of the regular classroom and no other services were provided to the teacher. The next most common relationship was for the specialist to instruct the teacher and provide one additional service. Rarely did the specialist provide instruction and two or more services. The study concluded the specialist-teacher relationship appear to restrict the opportunity for professional interaction which would have enhanced the reading program.

In an earlier study by Wylie (1969), survey results from reading specialists and teachers indicated differences in the perceptions of the two groups concerning the role of a reading specialist. Teachers viewed the specialist as a supplier of resource material, demonstrator of techniques, and provider of diagnostic and remedial assistance to small groups of students. The reading specialists preferred approaches that emphasized involvement with greater numbers, grade level meetings,
orientation programs, and the role as a consultant to teachers. Wylie concluded the roles of reading specialist should be well defined, understood, and agreed upon by all in order to improve the quality of a remedial reading program.

In a study conducted in 1966, Wilson attempted to determine which organizational patterns were the most conducive to an effective remedial reading program. School districts in the Los Angeles County were surveyed during the 1964-65 school year. The study investigated several concerns of which one is particularly related to this study. In soliciting the opinions of a panel of reading specialists as to which organizational patterns were the most conducive to the development of an effective remedial reading program, Wilson reported:

All six panelists indicated that reading specialists working with pupils outside the regular classroom offered the most satisfactory remedial approach; three panelists indicated a second choice of program as one in which reading specialists worked with pupils and teachers inside the regular classroom (Messer, 1970, p. 16).

The opinions of the panel of reading specialists are consistent with certain findings of the Summary of the 1975-76 Title I Evaluation Report. The findings concerning the use of reading specialists are:

1. Title I instruction in settings other than the regular classroom was associated with higher achievement for Title I reading and mathematics programs.

2. Title I programs which are more distinct from the regular school program are more effective in aiding Title I students in achieving the basic skills.

3. For the reading programs, diagnosis of instructional needs by instructional (subject matter) specialists rather than the regular classroom teacher was associated with higher achievement.
Based on the findings of the Title I Evaluation Report, several recommendations were made which are germane to this study.

1. Programs providing inservice/staff development to professional teaching staff should continue these programs. Further, the types and amount of inservice available to administrators and paraprofessionals should be changed to meet the needs of these groups more effectively.

2. Individual or small group instruction for Title I programs should be incorporated when designing future Title I programs.

3. Strategies to further increase the volunteer participation in Title I programs should be developed.

4. A special effort to develop or select Title I programs which supplement, and are not mere extensions of the regular school instructional programs, should be initiated.

5. The process of diagnosing students' specific instructional needs in the area of reading should be investigated to ensure that the individuals conducting the diagnosis possesses the skills, time, independence, and other resources necessary to perform this task.

Additional organizational and administrative considerations have been expressed by a number of authors. In conducting a survey of remedial reading personnel from several large cities in the United States, Merideth (1959) collected numerous recommendations, of which nine of the most frequent ones are listed below, concerning remedial reading programs:

1. A large quantity of materials should be made available to the remedial reading personnel.

2. The complete cooperation of principals, teachers and all superiors should be assured.

3. Careful selection of students for remedial teaching should be assured.

4. An adequate room should be reserved for the reading personnel's use.
5. The remedial reading program should have flexibility.

6. The cooperation of the special departments (health, speech, guidance, etc.) should be assured.

7. Provisions should be made for in-service classes in the teaching of reading for the classroom teachers.

8. Provisions should be made for follow-up activities after the students have been discharged by the remedial reading personnel.


In a more recent study, Reder and Martinez (1970) surveyed 21 Title I remedial reading programs from school districts in California that had reported moderate to substantial progress in achievement to identify and analyze their characteristics. Several of the findings are listed below:

1. A negative attitude toward reading was ranked as the primary problem associated with lack of achievement in reading at all grade levels.

2. Instruction was conducted by reading specialists with para-professional assistance available in almost half the districts.

3. No one method or approach of remedial instruction was used by all districts.

4. Communication systems between the reading specialists and the classroom teacher have been established at all grade levels (Jeanmarie, 1978, p. 26).

The factors that are attributed to successful remedial reading programs are numerous. The organizational and administrative patterns of these programs vary but have at least one common element. All programs have remedial reading personnel - reading specialists, classroom teachers, and instructional aides - who are knowledgeable in
reading and who provided additional instruction, either directly or indirectly, to students who need assistance. Without knowledgeable personnel, the means of transmitting knowledge or the teaching of reading—the organizational structure and administrative considerations—are of little value to students with remedial needs. As a result, considerable attention has been focused on the qualifications of reading specialists. Numerous authors have addressed this issue.

In a study previously cited, Meredith surveyed the opinions of 184 remedial reading personnel from several large cities in the United States. He asked each respondent to list the professional courses, both at the undergraduate and graduate level, that would prepare a teacher to be a reading specialist. In order of the frequency of their responses, the courses recommended are indicated below:

1. A course in remedial techniques.
2. A general course in reading all aspects.
3. A course in tests and measurement.
4. Various courses in psychology.
5. Laboratory work in remedial reading.
6. Various courses in guidance and counseling.
8. A course about the exceptional child.

Although guidelines have been recommended by the International Reading Association and a few states and universities, no universal
standards have been set up for preparing teachers to become reading specialists. For example, in the largest school district in Michigan, the requirements for reading specialists are twenty credit hours in reading with required courses in the field of learning disabilities or along with some clinical training (ibid, p. 29). In the school district in which this study was conducted, reading specialists are required to possess a master's degree in reading including six hours in diagnosis and remediation of reading difficulties. Specialists in this district are asked to perform a wide range of activities:

1. Assisting classroom teachers with reading testing, interpretation of various reading scores, selecting of materials, and grouping of children for instruction.

2. Testing new students in reading skills.

3. Providing extra reading instruction for children referred by the classroom teachers for additional reading help.

4. Assist building staff with writing the application and/or the implementation of the Article 3 Comp. Ed. program.

5. Assisting the principals and teachers with arrangements for psychological, social worker, and other special services help. Follow-up with parents and staff.

6. Sharing new ideas on reading with teachers.

7. Provide materials for classroom teachers to do quick diagnosis of reading levels in fall through informal group testing.

8. Meet with principals periodically to discuss reading program: generally and specifics pertaining to the building.

9. Assist with the identification and instruction of bilingual students.

10. Supervise and train the Reading Aides in the various buildings.

11. Develop and conduct inservice for the Reading Aides.

13. Assisting with interpretation of the school reading program to parents at PTA and other meetings, including the District Parent Council.

14. Meeting with parents at the building level and at the District-wide Title I and Article 3 Compensatory Education parent monthly meetings (mandated by Title I regulations). These meetings include orientation, conferencing, and workshops for parents.

15. Developing monthly packets of reading materials that are given to all 350 elementary teachers in Waterford. These materials have been very well-liked by the classroom teachers.

16. Preparation of materials and conducting workshops in all 24 public and 3 non-public elementary schools; including, but not limited to, the following:
   A. WRIMM Comprehension testing, record-keeping, and resource files.
   B. WRIMM Study Skills testing, record-keeping, and resource files.
   C. WRIMM Word Attack testing, record-keeping, and resource files.
   D. Young Author's Conferences.
   E. Developing materials and activities.

17. Serving on District committees involving reading: Reading Task Force, Language Arts committee, secondary reading, etc.

18. Continually up-dating all of the WRIMM files in WRIMM buildings, with WRIMM materials that are provided by the Learning Improvement Center office staff (Messer, Note 5).

The services requested of reading specialists in the school district in which this study was conducted are rather typical of the services provided by reading specialists throughout the nation. The two major services requested involve the diagnosis of reading deficiencies
and the providing of remediation, either directly to students or indirectly through consultations with classroom teachers or instructional aides. Although the importance of diagnosis and remediation are well substantiated in the research literature, there is less agreement on the implementation of these two concepts, especially remediation. The review of the literature in this section indicates the various implementations of these two concepts can effect student achievement.

Utilization of Instructional Aides

The use of instructional aides in the schools has been accepted on a nationwide scale. It is no longer a question of whether they should be involved in the classroom, but how best to prepare them and to use their skills and potential (Rauch, 1970). Dan Davies, former Associate Commissioner for Personnel Development in the U.S. Office of Education, provided a realistic perception of their value and limitations:

The introduction of auxiliary personnel into a school system may provide more individualized education for children and youth, may make possible a more flexible structure in the classroom, may make the job of teachers more manageable and productive, may serve to link school and community more closely, and may induce a reassessment of all the roles in education. On the other hand, auxiliaries may be introduced into a given school system without any of these effects. Auxiliary personnel are nobody's magic answer. Their potential contribution to the quality of education will not be realized automatically (ibid., p. 2).

The utilization of instructional or teacher aides is supported by two basic assumptions. The first assumption is that there is a positive correlation between the amount of teacher time spent on instruction and student achievement. Secondly, aides provide additional instruction
time and enable classroom teachers to allocate more of their time to
instruction. The logical deduction from these two assumptions is that
the use of instructional aides will increase student achievement. A
review of the literature indicates instructional aides do not always
increase student achievement. In fact, the Report of the 1974-75
Michigan Cost-Effectiveness Study, which examined some of the best and
worst compensatory education reading programs in the State, indicates a
negative relationship between the use of instructional aides and
student achievement unless the aides served as second teachers.
Instructional aides were defined as second teachers when they were
directly involved with instruction, planning, evaluation, and follow-up
activities for individual students.

The Michigan Cost-Effectiveness Study made several conclusions
concerning the use of instructional aides:

1. The successful teacher aide will directly, or
   indirectly, provide more instructional time for
   students.

2. Teacher aides are most effective when working with
   individual students as opposed to small groups.

3. Teacher aides are most effective when teaching basic
   skill acquisition, in both reading and math, as opposed
   to teaching higher level or more abstract skill
   utilization.

4. There is some evidence that aides are more effective in
   teaching mathematics than they are in reading.

5. If aide programs are to be successful, an evaluation of
   the aides' skills or competencies should be made before
   they are assigned duties in the classroom.

6. Aide programs are more likely to succeed if aides are
   paired with teachers who share similar expectations
   with respect to the role the aides will serve in the
   classroom.
The conclusions from the Michigan Cost-Effectiveness Study have several implications for the utilization of instructional aides. Aides who function primarily in a clerical role in the classroom may not have a positive effect on student achievement unless their activities permit classroom teachers to devote more time to instruction.

The aides' educational attainment is an important factor in determining the type of instruction they should provide. If aides have minimum formal education beyond high school, they will probably be more effective in working with individual students rather than with small groups since the skills needed for instructing groups of students are more complex than those needed for tutoring individual students.

Similarly, the teaching of basic skills requires less formal education than the teaching of more abstract subjects. If aides have minimum formal education beyond high school, they will probably be more effective in teaching mathematics than reading since the latter involves more complex skills.

Prior to providing instruction, an evaluation of aides' skills and competencies is necessary to ensure that aides are qualified to provide the type of instruction requested by the classroom teacher. If aides are paired with teachers who share similar expectations with respect to the role the aides will serve in the classroom, there will be less probability of role conflict, a phenomenon which generally has a negative effect on students as well as teachers and aides.

In summary, instructional aides are most effective when their utilization increases the amount of instructional time for students. This can be accomplished when aides function as second teachers, work
with individual students in basic skill areas, and have expectations similar to classroom teachers, taking into consideration teachers' and students' needs and the aides' competencies.

In examining some of the best and worst compensatory education reading programs in the State, the Michigan Cost-Effectiveness Study focused on several educational variables which could be changed or controlled by educational systems. The study's examination of the use of instructional aides is extensive. The results of the study are generally consistent with the findings of other research endeavors.

In a large scale longitudinal study, Conant (1971) examined the effects of instructional aides on student achievement in several different ways. The dependent variable for the analyses consisted of reading scores on a standardized test which was used throughout the district. The test scores of 3rd-grade students who were assisted by aides in the classroom were obtained for each year from 1965 to 1970. The scores were used in an analysis of achievement trends for those 3rd-grade students. Secondly, comparisons were made between the test scores of those students and the scores of other 3rd-grade students in the district. Finally, a longitudinal analysis of target students who remained in the schools for at least a three-year period was conducted.

The data from Conant's study indicated instructional aides had a positive effect on student achievement. Several of the important findings are presented below:

1. No significant improvement was observed during the first three years of the program.
2. Mean achievement of program students increased by three points between 1968 and 1970, reducing the achievement gap by one third. This achievement gain reversed a downward trend begun in the early 1960's.
3. The most severely educationally disadvantaged seemed to benefit most from the teacher aide program. The number of children scoring two standard deviations below the district mean was reduced by 37%. During the same period, the district-wide percent of students falling in this category increased dramatically.

4. In 1970, in each test score interval, 20 to 50% more students scored in an interval ten points higher than students prior to 1968.

The findings of Conant's study are consistent with the findings of the Michigan Cost-Effectiveness Study. The increase in instructional time provided by aides was associated with an increase in student achievement. However, Conant found that the mere presence of aides in the classroom did not necessarily increase instructional time provided to students by either the teachers or aides. When teachers supervised aides who were performing routine tasks, instructional time was not increased.

As indicated by the Michigan Cost-Effectiveness Study, aides are frequently involved in non-instructional activities. This observation is further supported by Bertoldi (1971) who conducted a study of kindergarten classrooms where aides were utilized. From the 36 kindergarten classrooms examined, five distinct classroom organizational patterns were identified, each utilizing the aides in a different role. In only two of the patterns did aides serve as "second teachers." In those two patterns, which constituted approximately 34% of the classrooms observed, instructional aides were extensively involved in evaluation, diagnosis, planning, and instruction - functions which define the "second teacher" role in the Michigan Cost-Effectiveness Study.

Of the five organizational patterns, only one was positively
related to student performance - the Teacher Educational Assistant Monitored setting. In this organizational pattern, which was utilized by only 10% of the classrooms examined, aides were involved in every aspect of the instructional process.

Bertoldi also found in the classrooms, where the aides had little input into the above functions, a high degree of tension and hostility between the teacher and aide. This conflict eventually had a disruptive effect on student achievement.

In examining the expectations of the aides' role in the classroom as perceived by aides, teachers, and principals, Bertoldi found considerable discrepancies with respect to the instructional-teaching role of the aide, which was also a source of conflict. Aides indicated they should be given more teaching responsibilities than teachers normally permitted them to have.

When aides do provide instruction, the number of aides in the classrooms can have an effect on student achievement. In an experimental study conducted by Larson (1970), the effects of using no aides, one aide, and five aides in the classroom were examined. Nine kindergarten classes were selected in which three classes had no aide, three had one aide, and three had five aides. The Metropolitan Readiness Test (MRT) was used to pretest and posttest students. Five months of instruction was provided between testing. The following chart displays the pre and posttest scores for each of the three groups:
Students in the classrooms with only one aide made the greatest gains, followed by students in the classrooms with five aides, while students who were serviced by no aides made the least gains.

Larson found that in the classrooms with five aides, the teachers devoted a considerable amount of time supervising the aides, time that could have been spent on instruction. However, in the classrooms which had only one aide, the amount of instructional time provided to students was increased. The findings of the study indicate that when aides do provide instruction, they may not be used effectively, especially if their presence results in a loss of teacher time devoted to instruction.

Furthermore, there is some evidence which suggests that using aides to provide reading instruction is not conducive to producing higher reading achievement. The Michigan Cost-Effectiveness Study indicated a negative correlation between reading achievement and using aides to conduct reading activities with small groups of compensatory education students. This finding is supported by Brickell (1971) who

<table>
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<tr>
<th>Tests 1-4</th>
<th>(No Aides)</th>
<th>(One Aide)</th>
<th>(Five Aides)</th>
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<tr>
<td></td>
<td>Group A</td>
<td>Group B</td>
<td>Group C</td>
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<tr>
<td>Reading Readiness</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pretest</td>
<td>41.813</td>
<td>38.215</td>
<td>40.725</td>
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<tr>
<td>Posttest</td>
<td>47.400</td>
<td>47.785</td>
<td>48.788</td>
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<td>Gain</td>
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<table>
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<td></td>
<td>11.613</td>
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<td>3.40</td>
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examined paraprofessional performance outside the classroom.

The study involved 63 experimental classrooms and 35 control classrooms of 3rd-grade students selected at random. Paraprofessionals provided remedial assistance to the experimental group while no paraprofessional services were provided to the control group. Students were pretested and posttested to measure differences in reading and math achievement and were administered two attitude inventories during posttesting. The most relevant findings are listed below.

1. In reading, students who show the greatest improvements are those served directly by the teacher though students served directly by the aide show greater improvement than students in classroom not having an aide.

2. In math, students who improve most are those given direct help by the paraprofessional though students left with the teacher show greater improvement than students in classrooms not having aides.

3. Black children make greater achievement gains than other students in classes with teacher aides. In math, black children improve most when given direct help by the aide.

4. Paraprofessional characteristics (age, sex, race, etc.) have no significant effect on student improvement in reading and math.

5. Paraprofessionals have a more positive effect on student improvement when working with students on an individual basis as opposed to working with students in small groups.

The first finding of Brickell's study suggests that the teaching of reading involves a series of complex skills which many aides simply have not attained. However, in math student improvement was greater in the classrooms where aides provided remedial instruction. Since the teaching of math at the 3rd-grade level involves the use of drill and memorization, tasks which may not be taught with much enthusiasm by the
regular classroom teachers, aides appear to be quite capable of working with low-achieving students in math. The Michigan Cost-Effectiveness Study's finding that there is a positive correlation between aides education level and reading achievement supports Brickell's study.

In a summative evaluation report of an ESEA/Title III program, designed to expand services to low-achieving students through the use of paraprofessional personnel in the Hammond City School, Indiana, the results of a research study were presented on the utilization of instructional aides. Prior to the study, the 24 aides involved received in-service training in audiovisual aids, motivational techniques, the psychology of dealing with underachieving students, establishing rapport with the professional staff, and ethics. Aides then received practical experience.

The study involved an experimental group of 832 students in grades 6, 7, and 8 who received remedial instruction from aides during the three years of the project. Groups of students received remedial instruction in one of several ways:

1. one semester of instruction - three days per week
2. one semester of instruction - five days per week
3. two consecutive semesters of instruction - three days per week
4. two consecutive semesters of instruction - five days per week
5. one semester of instruction - time interval of a summer or a summer + one semester - additional semester of instruction

The control group consisted of 197 students who were control subjects for either one semester or two consecutive semesters.
During the course of the study, reading specialists evaluated the effectiveness of the aides and also proposed additional in-service training programs. Building principals and parents of the students in the experimental group were surveyed to assess the effectiveness of the aides from their perceptions.

Students in both groups were pretested with an aptitude test and two achievement tests. Upon completion of the study, all students were posttested with the two achievement tests. The test scores indicated that students in the experimental group had significantly higher reading gains than students in the control group.

In an annotated bibliography by Eberwein, Hirst, and Magedanz (1976), a selected review of the literature on the effects of volunteer tutoring was completed for schools and community organizations interested in developing tutoring programs. Studies that did not state their findings or were redundant with the included articles were omitted. The first section reviewed 34 research studies on the effects of volunteer tutoring programs. The research can be classified into studies which use adult and student volunteers. The second section reviewed articles and books on training programs for tutors.

In reviewing the research literature on using adult volunteers, the majority of the studies indicated positive results. Brezeinski (1964) conducted a study of 450 preschool students in Denver, Colorado, to assess the effects of using parents to develop reading preskills. Three types of parental involvement groups were organized:

1. Control group - parents of the students received no reading instruction

2. Experimental group I - parents were instructed in reading techniques with 16 weeks of instruction via
television.

3. Experimental group II - these parents received the same type of instruction as the parents in Experimental group I but with a certified teacher in small groups.

Students in the three groups were tutored by their parents. In the experimental groups, students made statistically significant gains in achievement when tutored by their parents for 30 minutes or more per week.

Clegg (1971) studied the effects of using learning games by economically disadvantaged parents to increase the reading achievement of their children. Thirty inner-city grade students (predominantly black) in Washington, D.C., were tutored by their parents using learning games. Those parents tutored their children by playing one or more games daily with them which required a planned dialogue between participants imitating standard English. The control group did not use learning games. Students in the experimental group had significantly higher scores in vocabulary and composite reading than students in the control group; however, there were no significant differences in reading comprehension scores.

In a larger scale study completed in the Flint Public Schools, Flint, Michigan, parents in the experimental group tutored their children in reading for five months. One thousand students in kindergarten through 6th grade (predominantly black) were involved in the study. The combined overall mean gain for students in the experimental group was 5.3 months on the vocabulary and comprehension tests while students in the control group had an overall mean gain of 2.8 months.
Texley and Duorale (1973) reported in the "Omaha Public Schools Multiple Activities Program: An Evaluation, ESEA Title I" that instructional aides were effective. One thousand four hundred and sixty 1st-, 2nd-, and 3rd-grade students in Omaha, Nebraska, received tutoring from 31 paraprofessionals trained as reading aides. Criterion tests indicated that most of the students improved in certain reading skills due to being tutored by the aides. In an experimental study by Gaulke (1972), secondary effects of tutoring were detected. When 23 5th- and 6th-grade boys were tutored by adult volunteers, 100% of the students showed gains in comprehension or vocabulary while 89% of the students in the control group showed gains. In addition, teachers also indicated apparent gains in self-concept, interest in classroom work, and willingness to try new tasks for students in the experimental group.

Further evidence on the effects of using parents to tutor students is found in McFaren's (1965) unpublished doctoral dissertation. Parents of 72 1st-grade students in Oklahoma were instructed in the processes of learning to read and tutored their children for one year. The Gates Primary Reading Tests, administered at the end of the 1st grade, indicated significant gains on the sentence reading ability, paragraph reading ability, and total reading score for students in the experimental group over the students in the control group.

In another experimental study, Rosenuist (1972) studied the effects of using parents and older siblings to tutor 90 1st-grade students from a small urban residential district in California with a high socio-economic level. Games, puzzles and library books were used by the experimental group of parents and older siblings. No reading
books or workshops were used. Students in this group made three to four months gain over the control group of students.

Shaver (1971) studied the effectiveness of tutoring under-achievers in reading and writing. One hundred ninety-four 4th-, 7th-, and 10th-grade under-achieving students in Logan, Utah, were tutored by paraprofessionals. The students in the experimental group were tutored one hour per day for one school year. These students showed greater gains in reading and writing than students in a control group. Gains were greatest for 7th- and 10th-grade students.

Rist (1971) studied the effects of using black freshmen and sophomore university students to tutor 127 black 7th-grade students. Tutors worked with the students for one school year using paperbacks, black history materials, and newspapers to increase the reading levels of students. Tests indicated students in the control group gained an average of 0.6 years in reading ability while students in the experimental group gained an average of 3.4 years.

The majority of the studies cited in the annotated bibliography by Eberwein, Lowell, and Magedanz support the findings of the Michigan Cost-Effectiveness Study - low-achieving students, both black and white, from all levels of socio-economic backgrounds, need additional instructional time. However, the mere presence of instructional aides, paraprofessionals, or tutors do not guarantee substantial increases in student achievement. Several studies cited in the annotated bibliography also supports the Cost-Effectiveness Study findings on the effectiveness of teacher aides.

Such a study was conducted by Hurt (1972) who studied the effects
of using parents to tutor their children in vocabulary, comprehension, and work study skills. Ninety-six 2nd-grade students (whites) in Lexington, Kentucky, received five 30-minute periods of tutoring each week for 16 weeks. The classroom basal texts were used for tutoring. When compared to a control group, there were no significant differences reported.

In a study which indicated only partial success, Ryan (1964) examined the effects of tutoring, provided by parents, on the reading achievement of 232 2nd-grade students in Bloomington, Indiana. The experimental group of students who were tutored by their parents demonstrated significant gains on the Word Meaning Test of the Stanford Achievement Test when compared to a control group; however, there were no significant differences between the groups on the Paragraph Measuring Test.

Cramer (1971) separated 60 1st-grade students in Dayton, Ohio, into an experimental and control group to assess the effectiveness of a programmed tutoring approach developed by the Psychology Department of Indiana University. The parents of the students in the experimental group used the approach and provided their children with daily 15-minute tutoring sessions for one year. This group scored significantly higher than the control group in work knowledge and reading comprehension. No significant differences were detected on the tests of word discrimination.

Ellson (1968) studied the effects of programmed tutoring and direct tutoring by using an experimental model. Four hundred and eighty 1st-grade students from Indianapolis, Indiana, were divided into these
groups:

1. Experimental group I - students who received two 15-minute sessions of programmed tutoring daily for one year.

2. Experimental group II - students who received two 15-minute sessions of direct tutoring daily for one year. A variety of material was used in direct tutoring.

3. Control group - students who received regular instruction.

An analysis of covariance procedure indicated students who were in the first experimental group achieved significant gains in reading on their basal reader tests; however, no significant differences were obtained on a standardized achievement test. Students who received direct tutoring (Experimental group II) did not demonstrate any significant results. It appeared that programmed tutoring provided a more systematic approach with more consistency in instruction.

A review of the literature in this section indicates that paraprofessionals - instructional aides and volunteer tutors - can have a positive effect on student reading achievement. However, the mere presence of paraprofessionals, instructional aides, does not guarantee significant increases in reading gains. When assigned to classroom teachers, instructional aides are most effective as 'second teachers,' i.e., either directly or indirectly provide additional instruction time for students, teaching basic skills to individual students rather than to small groups, and in close cooperation with the classroom teacher. Although aides can increase the reading and math skills of low-achieving students, they may be more effective in teaching math, depending on the educational attainment level of the aides.
In the school district in which this study was conducted, the principal method of utilizing instructional aides is the tutorial method of the pullout system (Feun, Note 7). This method of instruction is reinforcing or supplemental in nature. The aides work with low-achieving students outside of the classroom, generally in the hallway, utilizing drill activities, games, or other methods designed by teacher to reinforce the classroom instruction on selected objectives or assist students on follow-up activities that the teacher had introduced. The aides work with both individual students and small groups of students. The advantages to this method of utilizing aides are:

1. Aides serve as "second teachers."
2. Aides are under the direct supervision of the classroom teacher.
3. The services provided by the aide are consistent with regular classroom instruction.
4. There is considerable flexibility in allocating service time for students.

Some of the disadvantages to the tutorial method are:

1. Hallways can be comparatively undesirable learning spaces.
2. The most skilled staff persons are not paired with students who are in need of additional instruction.

A second method of utilizing instructional aides is the monitorial method of the pullout system. This method is used occasionally, depending on the subject matter, the students to be taught, and the classroom teachers (Feun, Note 7). In using this method, the aides monitor a classroom activity while the teachers work with low-achieving students outside of the classroom.
There are many activities which can be effectively performed by aides in the classroom to allow the teachers to provide additional instruction to low-achieving students. Classroom assignments or "seatwork" is a common feature in almost all elementary classrooms as are periods designed for "review" of material already presented. Aides may be effective as helpers during seatwork or as review leaders. When aides function in these roles, the classroom teachers are free to work with low-achieving students outside of the classrooms, generally in the hallways. The advantages to this method are:

1. The most skilled staff persons provide remedial instruction.
2. Low-achieving students or compensatory education students do not "miss" any total group instruction.

The major disadvantage to this method is that aides must have some skills in maintaining classroom discipline and be able to work with large groups of students.

In either capacity, aides directly or indirectly increase the instructional time provided to low-achieving students. A job description for instructional aides in the Article 3 or Compensatory Education Program is provided below:

Job Description

for

Compensatory Education Aides

The primary duty of the Compensatory Education Aides is to assist
teachers by providing increased instructional time. The aide can provide additional time by:

a) directly working with Compensatory Education students on reinforcement or supplemental activities (tutorial); or

b) monitoring students while the teacher works directly with the Compensatory Education students (monitorial).

Examples:

Aides should not be assigned clerical tasks or other support work which does not result in increased instructional time for Compensatory Education students.

If an aide is used in a tutorial role, he/she would be working on the selected objectives by providing reinforcement or supplemental activities. Reinforcement activities would include drill activities, games or other methods designed by the teacher to reinforce the regular classroom instruction. Supplemental activities would include assisting students on follow-up activities that the teacher has introduced pertaining to the selected objectives.

If an aide is used in a monitorial role, he/she would be performing various activities which would enable the teacher to work with the Compensatory Education students on the selected objectives. The aide would act as a review leader - reviewing already presented material; or as a helper during seatwork periods.

Acceptable activities would include:

1. assisting in diagnosing a student's skill deficits by administering CRM's.

2. assisting in the planning of a program for a student.

3. assisting in the implementation of this program by
   a. acting as a tutor and:
      - assisting a student with a reinforcement ditto
sheet on the selected objective
- playing a reading or math game on the selected objective
- using flash cards -- sight words or math facts
- listening to students read
- assisting a student with workbook assignments
- reading to students

b. acting as a monitor and:
- helping students keep on task
- explaining directions to students
- encouraging students to continue working
- helping students keep their place
- assisting students with their assignments -- boardwork, workbooks, textbooks
- reviewing lessons taught -- vocabulary words or math concepts that have already been introduced.

4. assisting in the evaluation of the student's program.

Instructional aides are employed in school districts throughout the nation. They provide a variety of services of which some have a direct impact on student achievement, and subsequently, achievement retention. A review of the literature indicates that the mere presence of aides does not guarantee increases in student learning. When aides provide more instructional time for students, either directly or indirectly, work with individual students in basic skills acquisition, and are paired with classroom teachers who share similar expectations with respect to the role of the aides, an increase in student achievement can be expected. An assessment of aides' skills or competencies prior to being assigned to classrooms can assist in the proper utilization of aides.

Summer Retention of Student Achievement

A review of the literature on student-achievement retention over the summer months is limited. The two reports from the Educational
Research Center at the Stanford Research Institute are the major research endeavors which measured the amount of achievement loss, in terms of reading and mathematic scores, occurring over the summer months in relation to the amount of achievement gains obtained by students in remedial programs during the school year.

In other research and evaluation studies which investigated the effects of summer school on student achievement, the issue of summer retention/loss is also addressed. In a study from Nova University on a local elementary school reading interest project that was designed to overcome summer learning loss and to develop an interest in independent reading, the results indicated that students in the project made significant gains in comparison with two control groups. The first control group consisted of students who attended summer school and were taught with a basal reader approach, the traditional method of instruction. The second control group consisted of students who did not attend summer school (Anderson, 1976).

Humphrey (1967) evaluated the effects of a summer reading program that used television as the mode of instruction. The purpose of the study was to determine the reading gains or losses of 1st-grade students over two summers. The test results indicated reading gains for the program participants over the summer months while the average reading scores for students in the control groups declined.

In an evaluation study of a six-week summer school program for 502 disadvantaged students entering the junior high schools in Oakland, California, similar results were obtained. The goals of the program were to increase achievement levels, reduce summer learning losses,
increase motivation for learning, and provide enrichment activities. The subject areas taught in the program were in reading, language arts, and mathematics. The pretest and posttest results indicated gains in all areas except spelling (Godon, 1966).

In a study on the Connecticut Program for Migrant Children, Mosley (1972) evaluated the effectiveness of the Summer Enrichment Program which provided 964 students with academic and recreational experiences and health services. Test results indicated the program was effective since no decline in achievement was detected from the test scores.

Further evidence of summer learning loss was presented by Arnold (1968) in a study to determine changes in reading achievement between 2nd and 3rd grades for three groups of disadvantaged Mexican-American children. Control group participants showed significant losses over the summer vacation period while students in a special summer school program experienced significant gains. However, in reviewing the literature on summer retention for his study, Arnold cited studies from Elder (1927), Kramer (1927), Bruene (1927), and Morgan (1962) which indicate students in the intermediate grades experience positive growth from May to September. For students in the primary grades, studies from Brueckner (1924), Cook (1942), and Hillerich (1965) were cited which indicate a loss in reading retention over the summer months.

Although the majority of the studies on summer school indicate the instruction provided by the programs has a positive effect on student retention over the summer months, a study by Womble (1977) indicates that summer programs do not guarantee such an effect. As an introduction to his study, Womble cited a study by Scott (1967) which
indicated most students experience some summer loss in achievement regardless of the program they were involved in. Furthermore, Womble cited a finding by Gagne (1966) that indicated repetition and reinforcement can overcome the effects of forgetting brought about by interference and time lags. Womble's study examined the appropriateness of these two findings for low-achieving students.

A random sample of 4th- and 8th-grade students who attended a summer school designed for low achievers was compared to a similar group of students who did not attend summer school. Achievement was measured by the Stanford Achievement Test. Little summer loss was detected for both groups. In fact, most students gained over the summer months. Womble suggested the academic aspects of the program should be eliminated or de-emphasized and more enrichment activities should be included.

The majority of the studies on summer programs indicate low-achieving students experience some summer loss in achievement. Although Womble's findings do not support this, his study suggests that summer retention is effected by the type and intensity of instruction provided to students during the school year.

Summary

The review of the research literature in this chapter focused on three areas - utilization of reading specialists, utilization of instructional aides, and summer retention of student achievement. The literature indicates the need for thorough diagnosis and proper remediation in order to increase the achievement level of low-achieving
students. Traditionally, the task of providing these services have been assigned to reading specialists. With the demand to provide these services to a substantial number of students and the acceptance of instructional aides in school districts across the nation, the implementation of these services or the organizational structure of remedial reading programs can significantly effect student achievement, and thus, achievement retention over the summer months.

In the next chapter, the method of the study is presented which contains an explanation of the sample selected, the data collection procedures, and the measurement instruments. Chapter IV contains the analyses of the data and findings. In the final chapter, a summary of the study is presented with conclusions, recommendations, and implications for future research.
CHAPTER III
METHOD OF THE STUDY

The major purpose of this study was to assess the reading-achievement loss or gain occurring over the summer months for two groups of low-achieving students. The first group consisted of students who received remedial assistance from instructional aides and reading specialists during the school year. In the second group, students received remedial assistance from instructional aides, but not reading specialists during the school year. Specifically, the study focused on:

1. Whether there was a significant difference in the reading-achievement retention of the two groups over the summer months following the school year.

2. Whether there was a significant difference in the reading achievement of the two groups during the school year.

In both cases, the independent variable was the type of remedial instruction provided.

Selection of Sample

During the 1977-78 school year, there were 236 4th-grade students involved in the Article 3 program in the 27 elementary buildings of the school district selected for this study. Students were selected for the program on the basis of their past test scores and teacher recommendation. Many of these students received additional instruction
from reading specialists as part of the Title I program. These students were designated as the experimental group.

Since the number of students who received remedial assistance only from instructional aides was larger than the experimental group, students from similar school attendance areas were randomly selected for the control group, which consisted of 30 students.

Although students in both the experimental and control groups were low-achieving students, the selection criteria for students in the experimental group were slightly different than for students in the control group. Students in the former group were selected for remedial services based on a norm-referenced test and teacher recommendations. In the latter group, students were selected for remedial services based on teacher-made tests and teacher recommendations. Furthermore, students in the experimental group appeared to be in somewhat more need of remedial instruction as perceived by classroom teachers than some students in the control group.

Data Collection

As part of the district-wide testing program, all of the 3rd-grade students are tested each spring with the Comprehensive Tests of Basic Skills (CTBS), level 1, and the Short Form Test of Academic Aptitude (SFTAA), level 2. Subsequently, almost all of the 4th-grade students involved in the Article 3 program during the 1977-78 school year were tested in April of 1977 as 3rd-grade students.

In compliance with State requirements, the 4th-grade students involved in this study were pretested in September of 1977 and
posttested at the end of April, 1978 with level 1 of the CTBS. For the purposes of this study, these students were tested in September of 1978 as 5th-grade students with level 1 of the CTBS. Although level 1 is normed for grades 2.5 through 4.9, it was used again in the fall of 1978 to avoid the effects of changing the contents of the testing instrument. The norm tables provide for the conversion of scores up to the 9.9 grade level. The research design of this study is illustrated in Table 3.1.

Table 3.1
Research Design

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Students who received remedial assistance from both instructional aides and reading specialists (N=30).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>Students who received remedial assistance from instructional aides (N=30).</td>
</tr>
</tbody>
</table>

\[0_{1-8}\] = CTBS total reading score

\[A_{1-2}\] = SFTAA total score

<table>
<thead>
<tr>
<th>Spring 1977</th>
<th>Fall 1977</th>
<th>Spring 1978</th>
<th>Fall 1978</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>0₁A₁</td>
<td>0₂</td>
<td>0₃</td>
</tr>
<tr>
<td>Control Group</td>
<td>0₅A₂</td>
<td>0₆</td>
<td>0₇</td>
</tr>
</tbody>
</table>

Pre-summer gain/loss  Reading Achievement during school year  Post-summer gain/loss
To provide an answer to the first issue, Hypothesis I, an analysis of covariance (ANCOVA) procedure was conducted on the post-summer gain/loss of the two groups. The three covariates used in the analysis were the reading achievement gained during the school year, the pre-summer gain/loss, and the aptitude scores of both groups. The level of significance was set at 0.05.

To provide an answer to the second issue or Hypothesis II, an analysis of covariance procedure was conducted on the reading achievement gain during the school year for both groups. The covariates used in the analysis were the pre-summer gain/loss and the aptitude scores of both groups. The level of significance was again set at 0.05.

The variables "pre-summer gain/loss," "reading achievement," and "post-summer gain/loss" were computed for each student described in Table 3.2.

Table 3.2
Calculation of Research Variables

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-summer</th>
<th>Reading Achievement</th>
<th>Post-summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>02-01</td>
<td>03-02</td>
<td>04-03</td>
</tr>
<tr>
<td>Control</td>
<td>06-05</td>
<td>07-06</td>
<td>08-07</td>
</tr>
</tbody>
</table>

For both analyses, the CTBS unit of measurement was the expanded standard score (ESS) which is a standard score. The aptitude scores obtained from the SFTAA were standard scores (SS).
Measurement Instrument - CTBS

The principal instrument used to collect data in the study was the reading section of the Comprehensive Tests of Basic Skills (CTBS), level 1, form S. The reading section consists of a reading vocabulary and reading comprehension test. Each test is in multiple-choice format with four alternatives:

Test 1 - Reading Vocabulary

Recall of Synonym - Select the synonym of an underlined word in a given phrase.

Test 2 - Reading Comprehension

Literal Recall - Recall facts and details explicitly stated in a passage. The student is required to answer "who," "what," "where," and "when" questions.

Rewording - Given facts and details in a passage, answer questions by choosing paraphrased or reworded material.

Context Clues - Determine word meaning from the context in which a word is used.

Main Idea - Identify the topic of a passage, restate or summarize the central thought in a passage, identify author's purpose in writing the passage, derive a lesson or moral from the passage, and select the best title for a passage.

Descriptive Words - Define the physical attributes of an object or person presented in the passage, analyze emotions experienced in the passage, or decide what quality best characterizes a person.

Conclusions - Draw conclusions based on facts stated or implied in the passage or perceive cause-and-effect relationships between events or ideas.

Structure/Style - Identify the writer's use of words, including figurative language, to evoke a feeling or create an image, interpret symbols, and understand the writer's point of view and method of conveying it. Understand structural devices that help convey meaning, such as punctuation, function words, or tense (CTBS Test Coordinator's Handbook, p. 14).
The Comprehensive Tests of Basic Skills, Expanded Edition, was designed to measure the extent to which students have developed their capabilities, learned prerequisite skills needed to study in subject matter courses, and to function in society. Unlike tests which measure academic achievement in a specific subject area, the CTBS is not substantially affected by the particular content material used to teach students. However, test performance is affected by the grade level in which specific topics are introduced in the curriculum and the development of student capabilities needed to perform the task.

The quality of the CTBS is reflected in the reliability or stability of a test, which refers to its consistency in measurement, the greater the consistency, the greater the reliability. The Kuder-Richardson formula 20 (KR-20) was used to establish the reliability coefficients for the test items in the Comprehensive Tests of Basic Skills. The procedure provides correlation coefficients that approximated the average of all split-half coefficients that would be obtained on all possible divisions of the test into equivalent halves (ibid., p. 35).

A function of reliability which is an important factor to consider when assessing the accuracy of test scores is the standard error of measurement. With all achievement and aptitude tests, a certain degree of discrepancy between students' true scores and their obtained scores exist. The standard error of measurement indicates the standard deviation in scores (raw scores, scale scores, or grade equivalent units) that would occur if a test was administered to students repeatedly.
The standard error of measurement is based on the following expectations:

1. 68% of the time the examinee's obtained and true scores would fall within ± 1 SEM of each other.
2. 95% of the time the examinee's obtained and true scores would fall within ± 2 SEMs of each other.
3. 99% of the time the examinee's obtained and true scores would fall within ± 3 SEMs of each other (CTBS Technical Bulletin No. 1, p. 23).

The reliability of level 1 of the CTBS was established from a stratified random sample drawn from public and Catholic schools within the 50 states and consisted of 16,550 students in grades 2, 3, and 4. The reliability coefficients, as established by the Kuder-Richardson formula 20 (KR 20), and the standard errors of measurement in terms of scale scores for each grade normed are presented in Table 3.3.

Table 3.3

<table>
<thead>
<tr>
<th>Reliability Coefficients</th>
<th>S.E.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>Grade</td>
</tr>
<tr>
<td>Test or Total</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>4.7</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.89</td>
</tr>
<tr>
<td></td>
<td>.92</td>
</tr>
<tr>
<td></td>
<td>.93</td>
</tr>
<tr>
<td>Comprehension</td>
<td>.92</td>
</tr>
<tr>
<td></td>
<td>.94</td>
</tr>
<tr>
<td></td>
<td>.94</td>
</tr>
<tr>
<td>Total Reading</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td>.97</td>
</tr>
</tbody>
</table>

The content validity of the Comprehensive Tests of Basic Skills refers to the extent to which the content of the test constitutes a representative sample of the skills and knowledge which are the goals of
instructions. The development of the CTBS/S, which level 1 is a part of, began with a critical review of CTBS, form Q. Test items from form Q were revised and updated. The best items were combined with new items to produce form S, which was comparable with existing forms. The following is a summary of the major changes made in the development of the reading section of form S:

Reading Vocabulary - The rationale for this test requires the student to define words according to the context of a phrase. For form S, an effort was made to ensure that the alternatives referred to the context of the word being tested rather than the whole phrase.

Reading Comprehension - Many new reading comprehension passages were written to appeal to today's students. These relevant, noncondescending passages portray feelings and situations universally experienced by young people regardless of ethnic background or where they happen to live. Some items measure literal comprehension, but most items measure critical skills such as the ability to identify the theme, character analysis, and inference (CTBS Technical Bulletin No. 1, p. 25).

All of the test items for form S, as well as for the equivalent form T, were written by classroom teachers from the appropriate grades in cooperation with curriculum specialists and testing specialists from CTB/McGraw-Hill. All levels of the CTBS were reviewed by content specialists who provided both overall and item-by-item review.

All of the test items were edited by the CTB/McGraw-Hill staff using well-established rules for the writing of test items. For level 1, control of vocabulary difficulty was based on A Revised Core Vocabulary: A Basic Vocabulary for Grades 1-8, An Advanced Vocabulary for Grades 9-13. Vocabulary words were drawn from the lower and higher grade levels to provide floor and ceiling levels.
Based on the data from experimental sessions, the final test items were selected and edited while observing the following rules:

1. A test item must not be extremely difficult or extremely easy for any grades for which it is designed.

2. A test item must be easiest for the highest grade level for which it is designed and most difficult for the lowest grade level.

3. Each of the multiple-choice distractors must attract an appreciable, but not a very large, proportion of examinees.

4. After the examinees have been divided into fifths according to their scores on the test, the number of examinees in each fifth selecting the keyed answer must diminish progressively from the highest to the lowest fifth.

5. The point-biserial correlation coefficient, obtained by correlating the examinee's response to a test item with her or his total number of correct responses to the test, must be greater than +.20.

6. The item must meet minimal statistical requirements based on a sample of black students (CTBS Test Coordinator's Handbook, pp. 34-35).

In validating the test items, all of the commonly used principles for validation were applied. However, the final evaluation of a test's validity for a particular school district must be based on that district's own objectives and curriculum (CTBS Technical Bulletin No. 1, p. 25).

National Norms

The standardization of the Comprehensive Tests of Basic Skills was designed to provide both national norms and large-city norms, based on a stratified random sample of the entire national school population. The sample, which consisted of approximately 131,000 students in grades K
through 12, was drawn from greater city public schools, other public schools, and Catholic schools in 1972 and 1973. The two public school samples were stratified according to geographic region, average enrollment per grade, and community type. Schools located in urban centers with a minimum enrollment of 5,000 students per grade were classified as greater city public schools. The Catholic school population was stratified by geographic region and enrollment. The breakdown of sample size is indicated in Table 3.4.

Table 3.4
Standardization Sample Size by School Type

<table>
<thead>
<tr>
<th>School Type</th>
<th>N of Schools</th>
<th>N of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater City Public</td>
<td>73</td>
<td>37,650</td>
</tr>
<tr>
<td>Other Public</td>
<td>186</td>
<td>84,567</td>
</tr>
<tr>
<td>Catholic</td>
<td>26</td>
<td>8,742</td>
</tr>
<tr>
<td>Total</td>
<td>285</td>
<td>130,959</td>
</tr>
</tbody>
</table>

The norming of the CTBS series was based on the sample sizes in Table 3.5.
Table 3.5
Standardization Sample Size by Level of CTBS

<table>
<thead>
<tr>
<th>Level of CTBS</th>
<th>N of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>16,562</td>
</tr>
<tr>
<td>B</td>
<td>13,494</td>
</tr>
<tr>
<td>C</td>
<td>8,831</td>
</tr>
<tr>
<td>1</td>
<td>16,550</td>
</tr>
<tr>
<td>2</td>
<td>17,802</td>
</tr>
<tr>
<td>3</td>
<td>24,764</td>
</tr>
<tr>
<td>4</td>
<td>32,956</td>
</tr>
<tr>
<td>Total</td>
<td>130,959</td>
</tr>
</tbody>
</table>

Type of Scores

Correct responses to test items, or raw scores, have limited usefulness when comparisons are made between tests or between grades. As a result, raw scores are converted into other units of measure, such as scale scores, grade equivalent units, stanines, percentile ranks, etc., that are calibrated or normed with a reference group or norm group.

The CTBS unit of measure used for the study is the expanded standard score (ESS) or scale scores which are produced from a single, equal interval scale of scores across all grades for use with all levels of the CTBS. The scale range is from 000 to 999. The publishers of the test adopted the term "expanded standard score" to indicate that the scale can be transformed into traditional standard scores, similar to T scores or stanines, at any grade point within a level.

The expanded standard scores or scale scores provide the following advantages:

1. Scale scores can be added, subtracted, and averaged regardless of the level administered. Because the difference between any two successive scores on the scale is the same, differences can be quantified.
2. Direct comparisons among grades are possible, giving a representation of growth rate, because scores on all levels of the CTBS are related to a single scale rather than to separate scales for each grade and semester.

3. Scale scores can be used in longitudinal studies of grades or individual students from Kindergarten through high school because they are independent of form, level, grade, time of year of testing, and restandardization.

4. A flexibility in use of test data is provided for studies not planned at the time of testing (CTBS Test Coordinator's Handbook, p. 39).

Measurement Instrument - SFTAA

The second instrument used in this study was the total score of the Short Form Test of Academic Aptitude (SFTAA), level 2. The SFTAA is an academic aptitude test designed to assess intellectual development and predict potential rate of progress and level of success. It contains four subtests which measure:

**Vocabulary** - measures verbal comprehension, knowledge of word meanings, and the ability to relate words which are not exact synonyms.

**Analogies** - measures the ability to recognize analogic relationships which may be literal or symbolic.

**Sequences** - measures ability to recognize changes in patterns, rules, or principles in a series of numbers, letters or dot changes.

**Memory** - measures retentive ability which requires recalling facts, making inferences, and recalling the logical flow of a story which was recited prior to administering the first test (SFTAA Test Coordinator's Handbook, p. 7).

The Short Form Test of Academic Aptitude is intended for use in grades 1 through 12. It was designed to measure intellectual functions of a relatively abstract nature which are important for success in the grade range specified.
The vocabulary and memory subtests constitute the language section while the analogies and sequences subtests make up the nonlanguage section. The language section measures abilities that are closely related to academically oriented tasks while the nonlanguage section measures abilities that are less dependent on verbal skills, and subsequently, are less sensitive to cultural differences. Although both the language and nonlanguage sections are normed, the total score is the most dependable estimate of general ability, with the language and nonlanguage scores constituting separate estimates of more specific abilities.

The reliability and validity of the SFTAA were established using common standardization procedures. Reliability coefficients for each subtest, the language and nonlanguage sections, and total score were produced from the Kuder-Richardson formula (KR-20).

The reliability coefficients and standard errors of measurement in terms of raw scores for each grade normed is presented in Table 3.6. (The standard errors of measurement in standard scores were not available from the publisher, CTB McGraw-Hill.)

Table 3.6

<table>
<thead>
<tr>
<th>Grade</th>
<th>Reliability Coefficients</th>
<th>S.E.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>.94</td>
<td>3.81</td>
</tr>
<tr>
<td>4</td>
<td>.95</td>
<td>3.55</td>
</tr>
<tr>
<td>5</td>
<td>.96</td>
<td>3.30</td>
</tr>
</tbody>
</table>
Evidence of the stability of the SFTAA was demonstrated by using the Pearson product-moment correlation procedure to correlate the test scores of students in grades 1 through 12. With level 2 of the SFTAA, students in grades 3 and 4 were tested and then retested approximately two weeks later with the same level of the test. Furthermore, evidence of long-term reliability was established by testing students in grades 1 through 11 and then retesting them after a 14-month interval. The correlational data on the total score is presented in Table 3.7.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Two-week Interval</th>
<th>Fourteen-month Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>.91</td>
<td>.82</td>
</tr>
<tr>
<td>4</td>
<td>.95</td>
<td>.85</td>
</tr>
</tbody>
</table>

Evidence of the validity of the SFTAA is inferred from the development of the test. The SFTAA is derived from the California Test of Mental Maturity (CTMM) series and is considered by the publisher as the successor of the California Short Form Test of Mental Maturity (CTMM-SF) which was developed in 1963.

The best items from the CTMM series were incorporated into the SFTAA with new items that were more relevant to the school population in 1970. The effectiveness of each item was ascertained through item analyses of data obtained through tryout testing. The final selection of items was based on a multiple criteria such as the appropriate level
of difficulty of the items, biserial correlation of item success with subtest and total score, item variance, etc.

The SFTAA was standardized jointly with the 1970 Edition of the California Achievement Tests (CAT-70) so that Anticipated Achievement Grade Equivalents and Scale Scores could be obtained. Anticipated achievement scores indicate the extent to which students are achieving in accordance with their academic aptitude. The SFTAA was also correlated with the Comprehensive Tests of Basic Skills series to produce similar anticipated achievement scores.

On the issue of construct validity, the publisher cited a research study conducted by Dr. George R. Burket which constitutes solid evidence for the construct validity of the SFTAA. He hypothesized that the SFTAA would provide an index of learning rate if the CAT-70 was used as a measure of achievement and if the child's grade in school was used as a measure of learning time.

Using a national sample of 176,000 students in Grade 1 through 12, he tested his hypothesis by pairing each of the four SFTAA subtests with each of the four "total" scores of CAT-70 (Reading, Mathematics, Language, and Total Battery). For each of the resulting 16 pairs, this empirical procedure (multiple regression) correctly identified the SFTAA subtest as the aptitude variable, i.e., as a measure of learning rate, and the CAT-70 totals as the achievement measure, i.e., as a measure of amount of school material learned.

National Norms

The standardization of the Short Form Test of Academic Aptitude was designed to provide national norms based on a stratified random sample of the national school population. The sample consisted of 197,912 students in grades 1 through 12 from 180 public and 19 Catholic school
districts in 36 states. The SFTAA was standardized jointly with the California Achievement Tests in 1970.

The norming of each level of the SFTAA was based on the sample sizes in Table 3.8.

Table 3.8
Standardization Sample Size
by Level of SFTAA

<table>
<thead>
<tr>
<th>Level</th>
<th>Grades</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1, 2, 3</td>
<td>38,384</td>
</tr>
<tr>
<td>2</td>
<td>3, 4, 5</td>
<td>31,174</td>
</tr>
<tr>
<td>3</td>
<td>5, 6, 7</td>
<td>33,421</td>
</tr>
<tr>
<td>4</td>
<td>7, 8, 9</td>
<td>37,023</td>
</tr>
<tr>
<td>5</td>
<td>9, 10, 11, 12</td>
<td>57,910</td>
</tr>
<tr>
<td>Total</td>
<td>1-12</td>
<td>197,912</td>
</tr>
</tbody>
</table>

Type of Scores

The SFTAA unit of measurement used in the study was the standard score. Raw scores, or the number of correct responses, for each subtest were combined for a total score which was then converted into a standard score. The standard score scale has a mean of 50 and a standard deviation of 10 and is based on the assumption of a normal distribution of scores. Since the scale is an equal interval scale, statistical computations can be performed and comparisons can be made between tests.

Summary

In Chapter III, the method of study was discussed in several sections. The selection of the sample, collection of the data, and the
quality of the two measuring instruments were presented in detail.

The data were organized to test two hypotheses. The analysis of covariance technique was used to analyze the data relative to the hypotheses. The intent of the study was to assess the effects of two types of remedial instruction on reading achievement during a school year and the retention of those skills over the following summer.
CHAPTER IV
DATA ANALYSES AND FINDINGS

The results of the data collection and analyses described in Chapter III are presented in this chapter. The data are organized into two sections. In the first section, Testing of the Hypotheses, the outcome of the statistical procedures used to test the hypotheses is presented first. This is followed by the section which displays the frequency distributions of the research variables. In both sections, explanatory statements accompany the presentations of the data. The Statistical Package for the Social Sciences (SPSS) was used to test the hypotheses and to generate the descriptive data.

Testing of the Hypotheses

As a preliminary step to testing the two hypotheses, the "pre-summer gain/loss," or the summer retention prior to the school year in which both groups received remedial assistance, was compared to determine if there were any significant difference between the two groups. The aptitude scores from the spring of 1977 were used as covariates. An analysis of covariance procedure indicated no significant difference in the pre-summer scores of the two groups as indicated in Table 4.1. Students with missing scores were not included in the analysis as reflected by the size of the two groups (N). The level of significance was set at 0.05.
### Table 4.1
Analysis of Pre-Summer Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental (Aides &amp; Read. Special.)</td>
<td>19.995</td>
<td>35.608</td>
<td>22</td>
</tr>
<tr>
<td>Control (Aides)</td>
<td>3.000</td>
<td>28.621</td>
<td>28</td>
</tr>
</tbody>
</table>

### Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>D.F.</th>
<th>Mean Squares</th>
<th>F</th>
<th>Sign. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>2658.348</td>
<td>1</td>
<td>2658.348</td>
<td>2.577</td>
<td>0.115</td>
</tr>
<tr>
<td>Within groups</td>
<td>48489.500</td>
<td>47</td>
<td>1031.691</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of significance</td>
<td>= 0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The two hypotheses of the study focused on the summer retention of reading achievement and the reading skills gained during the school year for two groups of students who received remedial instruction during the school year. The two periods of time under study are indicated in Table 4.2, along with the "pre-summer" period, or the summer prior to the school year in which the two groups received remedial instruction.

### Table 4.2
Research Design

- **Experimental Group** = Students who received remedial assistance from both instructional aides and reading specialists (N=22).
- **Control Group** = Students who received remedial assistance from instructional aides (N=28).
\[ O_{1-8} = \text{CTBS total reading score} \]

\[ A_{1-2} = \text{SFTAA total score} \]

<table>
<thead>
<tr>
<th></th>
<th>Spring 1977</th>
<th>Fall 1977</th>
<th>Spring 1978</th>
<th>Fall 1978</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>( O_1 )</td>
<td>( O_2 )</td>
<td>( O_3 )</td>
<td>( O_4 )</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>( O_5 )</td>
<td>( O_6 )</td>
<td>( O_7 )</td>
<td>( O_8 )</td>
</tr>
</tbody>
</table>

Pre-summer gain/loss | Reading Achievement during school year | Post-summer gain/loss

**Hypothesis I**

There is no significant difference in the summer retention of reading achievement between students who received remedial assistance from both instructional aides and reading specialists and students who received remedial assistance from instructional aides.

The analysis of covariance procedure was used to test the criterion variable of hypothesis I, Post-Summer Gain/Loss. The covariates used were Reading Achievement, Pre-Summer Gain/Loss, and the SFTAA scores of the two groups. The results of the analysis indicated no significant difference in the summer retention of reading skills of the two groups of students. Therefore, hypothesis I was retained. The data are displayed in Table 4.3. Students with missing scores were not included in the analysis as indicated by the size of the two groups (N).
Table 4.3
Analysis of Post-Summer Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>11.227</td>
<td>29.844</td>
<td>22</td>
</tr>
<tr>
<td>Control</td>
<td>-8.107</td>
<td>32.260</td>
<td>28</td>
</tr>
</tbody>
</table>

Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>Sign. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1938.707</td>
<td>1</td>
<td>1938.707</td>
<td>2.252</td>
<td>0.140</td>
</tr>
<tr>
<td>Within groups</td>
<td>38740.230</td>
<td>45</td>
<td>860.894</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Level of significance = 0.05

Hypothesis II

There is no significant difference in the reading achievement obtained during the school year between students who received remedial assistance from both instructional aides and reading specialists and students who received remedial assistance from instructional aides.

For hypothesis II, the analysis of covariance was used to analyze the criterion variable - Reading Achievement. The covariates used were Pre-Summer Gain/Loss and SFTAA scores. The results of the analysis indicated no significant difference in the reading achievement of the two groups. Subsequently, hypothesis II is not rejected. Table 4.4 reflects the data from the analysis. Again, students with missing scores were excluded from the analysis.
Table 4.4
Analysis of Reading Achievement Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S.D.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>46.591</td>
<td>38.264</td>
<td>22</td>
</tr>
<tr>
<td>Control</td>
<td>48.429</td>
<td>26.872</td>
<td>28</td>
</tr>
</tbody>
</table>

Analysis of Covariance

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>Sign. of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>22.974</td>
<td>1</td>
<td>22.974</td>
<td>0.021</td>
<td>0.885</td>
</tr>
<tr>
<td>Within groups</td>
<td>50047.852</td>
<td>46</td>
<td>1087.997</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Level of significance = 0.05

Frequency Distribution of Research Variables

In the first section, the outcome of the statistical procedures used to test the two hypotheses were presented in table and written format. In the next section, the frequency distributions of the research variables for the experimental group are displayed in Table 4.5 to 4.8 and in Tables 4.9 to 4.12 for the control group accompanied by explanatory statements. The research variables of the study are the SFTAA, Pre-Summer Gain/Loss, Reading Achievement, and Post-Summer Gain/Loss scores.

The SFTAA was administered in the spring of 1977 when students in the study were in the 3rd grade. Of the 30 students in the experimental group, 22 students had complete scores from all four testing sessions. Subsequently, those students were involved in the statistical
procedures in section 1 of this chapter. The SFTAA scores of those students are displayed in Table 4.5. The mean score for the group is 39.818 with a standard deviation of 5.151.

Table 4.5

Frequency Distribution of the SFTAA Scores for the Experimental Group

<table>
<thead>
<tr>
<th>SFTAA Scores</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>32</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>35</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>37</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>38</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>39</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>40</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>43</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>44</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>47</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>48</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mean 39.818
Median 39.500
Standard Error 1.098
Standard Deviation 5.151

The second research variable for the experimental group, Pre-Summer Gain/Loss, is displayed in Table 4.6. The mean score of the variable is 19.955 and the standard deviation is 35.608.
Table 4.6

Frequency Distribution of the Pre-Summer Gain/Loss Scores for the Experimental Group

<table>
<thead>
<tr>
<th>Pre-Summer Gain/Loss</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>-64</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-31</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-23</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-15</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-4</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>42</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>44</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>49</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>62</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>111</td>
<td>1</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Total 22 100.0

Mean 19.955 Standard Error 7.592
Median 21.500 Standard Deviation 35.608

The third research variable for the experimental group, Reading Achievement, is presented in Table 4.7. The mean score of the variable is 46.591 and the standard deviation is 38.264.
Table 4.7
Frequency Distribution of the Reading Achievement Scores for the Experimental Group

<table>
<thead>
<tr>
<th>Reading Achievement</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>-28</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-15</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>29</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>37</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>48</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>51</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>55</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>71</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>77</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>78</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>93</td>
<td>1</td>
<td>4.5</td>
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<tr>
<td>95</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>141</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mean 46.591
Median 37.500

Standard Error 8.158
Standard Deviation 38.264

The last research variable, and the primary focus of this study, for the experimental group, Post-Summer gain/loss, is presented in Table 4.8. The mean score of the variable is 11.227 and the standard deviation is 29.844.
### Table 4.8

Frequency Distribution of the Post-Summer Gain/Loss Scores for the Experimental Group

<table>
<thead>
<tr>
<th>Post-Summer Gain/Loss</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>-65</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-51</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-22</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-19</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>-4</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>4.5</td>
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<tr>
<td>12</td>
<td>1</td>
<td>4.5</td>
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<tr>
<td>15</td>
<td>2</td>
<td>9.1</td>
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<tr>
<td>16</td>
<td>1</td>
<td>4.5</td>
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<tr>
<td>17</td>
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<td>4.5</td>
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<tr>
<td>19</td>
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<td>4.5</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>33</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>39</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>48</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>54</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mean 11.227
Median 15.500

Standard Error 6.363
Standard Deviation 29.844

In the next set of tables, Tables 4.9 to 4.12, the frequency distributions of the research variables for the control group are presented. Of the 30 students in the control group, 28 students had complete scores from all four testing sessions. As a result, those students were involved in the statistical analyses in section 1 of this chapter. The first variable presented is the SFTAA scores of the students in Table 4.9. The mean score for the group is 43.500 and the standard deviation is 6.064.
Table 4.9

Frequency Distribution of the SFTAA Scores for the Control Group

<table>
<thead>
<tr>
<th>SFTAA Scores</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>37</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>38</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
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<tr>
<td>43</td>
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<td>7.1</td>
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</tr>
<tr>
<td>Total</td>
<td>28</td>
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</tbody>
</table>

Mean 43.500  Standard Error 1.146
Median 44.500  Standard Deviation 6.064

The second research variable for the control group, Pre-Summer Gain/Loss, is displayed in Table 4.10. The mean score of the variable is 3.000 and the standard deviation is 28.621.
Table 4.10
Frequency Distribution of the Pre-Summer Gain/Loss Scores for the Control Group

<table>
<thead>
<tr>
<th>Pre-Summer Gain/Loss</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>-75</td>
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<td>-39</td>
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<tr>
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<td>3.6</td>
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<tr>
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<td>1</td>
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<tr>
<td>-14</td>
<td>1</td>
<td>3.6</td>
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<td>1</td>
<td>3.6</td>
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<td>3.6</td>
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<td>3.6</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>7.1</td>
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<tr>
<td>10</td>
<td>1</td>
<td>3.6</td>
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<tr>
<td>12</td>
<td>1</td>
<td>3.6</td>
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<td>2</td>
<td>7.1</td>
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<td>7.1</td>
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<tr>
<td>36</td>
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<td>46</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mean 3.000  
Median 5.500  
Standard Error 5.409  
Standard Deviation 28.621

The third research variable for the control group, Reading Achievement, is presented in Table 4.11. The mean score of the variable is 48.429 and the standard deviation is 26.872.
Table 4.11  
Frequency Distribution of the Reading Achievement Scores for the Control Group

<table>
<thead>
<tr>
<th>Reading Achievement</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
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<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>44</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>55</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>58</td>
<td>1</td>
<td>3.6</td>
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<tr>
<td>60</td>
<td>1</td>
<td>3.6</td>
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<tr>
<td>96</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>100.0</strong></td>
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</tbody>
</table>

Mean 48.429
Median 44.000
Standard Error 5.078
Standard Deviation 26.872

The last research variable for the control group, Post-Summer Gain/Loss, is displayed in Table 4.12. The mean score of the variable is -8.107, i.e., students in the control group experienced summer loss of reading skills as measured by their CTBS scores. The standard deviation of the scores is 32.260.
Table 4.12

Frequency Distribution of the Post-Summer Gain/Loss Scores for the Control Group

<table>
<thead>
<tr>
<th>Post-Summer Gain/Loss</th>
<th>Absolute Frequency</th>
<th>Relative Frequency Percentages</th>
</tr>
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<tbody>
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<td>7.1</td>
</tr>
<tr>
<td>39</td>
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</tr>
</tbody>
</table>

Total 28 100.0

Mean -8.107 Standard Error 6.097
Median -9.500 Standard Deviation 32.260
Summary

In testing the two hypotheses of the study, no significant differences were detected between the two groups in terms of summer retention and reading achievement during the school year. The instruction provided by the reading specialists to students in the experimental group did not significantly increase the retention of reading skills over the summer months nor the reading achievement of the students during the school year.
CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The primary purpose of this study was to determine if there were any significant differences in the amount of reading retention occurring over the summer months for two groups of low-achieving students. The experimental group consisted of students who received remedial assistance from instructional aides and reading specialists during the school year. In the control group, students received remedial assistance from instructional aides, but not from reading specialists, during the school year. Specifically, the study focused on two issues:

1. Whether there was a significant difference in the retention of reading achievement of the two groups over the summer months following the school year.

2. Whether there was a significant difference in the reading achievement of the two groups during the school year.

In both cases, the independent variable was the type of remedial instruction provided.

Students in both the experimental and control groups were tested in the spring of 1977, fall of 1977, spring of 1978, and in the fall of 1978 with the reading tests of level 1, form S of the Comprehensive Tests of Basic Skills (CTBS). In the fall of 1977, all students in the study were tested with an aptitude test, the Short Form Test of Academic Aptitude (SFTAA), level 2. The research design of this study is illustrated below:
Table 5.1

Research Design

**Experimental Group** = Students who received remedial assistance from both instructional aides and reading specialists \( (N=22) \).

**Control Group** = Students who received remedial assistance from instructional aides \( (N=28) \).

\[ O_{1-8} \quad = \quad \text{CTBS total reading score} \]

\[ A_{1-2} \quad = \quad \text{SFTAA total score} \]

<table>
<thead>
<tr>
<th>Spring 1977</th>
<th>Fall 1977</th>
<th>Spring 1978</th>
<th>Fall 1978</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
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<td>( 0_2 )</td>
<td>( 0_3 )</td>
</tr>
<tr>
<td>Control Group</td>
<td>( 0_5A_2 )</td>
<td>( 0_6 )</td>
<td>( 0_7 )</td>
</tr>
</tbody>
</table>

To provide an answer to the first issue, Hypothesis I, an analysis of covariance (ANCOVA) procedure was conducted on the post-summer gain/loss of the two groups. The three covariates used in the analysis were the reading achievement gained during the school year, the pre-summer gain/loss, and the aptitude scores of both groups. The level of significance was set at 0.05. The results of the analysis indicated there were no significant differences in the reading retention of the
two groups over the summer months.

To resolve the second issue, or Hypothesis II, the same statistical procedure was used to compare the reading achievement of the two groups during the school year. The covariates used in the analysis were the pre-summer gain/loss and the aptitude scores of both groups. The results indicated there were no significant differences at the 0.05 level.

Conclusions

An analysis of the findings of the study indicates the following:

1. It appears the additional remedial assistance provided by reading specialists to the experimental group did not significantly increase their retention of reading skills over the summer months.

2. The reading achievement obtained by the experimental group during the school year was not significantly increased by the remedial assistance provided by reading specialists.

In both analyses, the independent variable, which was the remedial assistance provided by reading specialists, did not make a significant difference in the criterion variables - summer retention and reading achievement during the school year. With summer retention, the lack of instruction during the summer months appears to have a more dominant effect than the amount of instruction received the previous school year. With the second criterion variable, it appears that reading specialists were not effective in teaching reading skills to low-achieving students. However, aides received instruction and supervision from both reading specialists and classroom teachers throughout the school year. The method of employing aides in the school district in which this
study was conducted, which is supported by the research literature, and the qualifications of the reading specialists suggest that the use of instructional aides in providing remedial instruction was highly effective.

**Recommendations**

From the data presented in the previous chapters and the conclusions made in this chapter, two recommendations are suggested. The first recommendation pertains to the roles of reading specialists and instructional aides, and the second pertains to the replication of this study.

In many school districts, reading specialists are asked to provide a variety of services, of which diagnosing reading deficiencies and providing remediation are the two major requests. This study indicates that with proper preparation and supervision, instructional aides can provide effective remediation to low-achieving students in reading. Subsequently, reading specialists should be more involved in training and supervising aides than providing direct remediation to students, and thus be able to provide other types of services more frequently and in greater depth.

At the onset of this study, there were 30 students in both the experimental and control groups. Due to attrition and absenteeism, there were 22 sets of complete scores for students in the experimental group and 28 sets of complete scores for students in the control group. Since the analyses of the data were performed with relatively small groups of students, this study should be replicated with larger sample
sizes to provide more substantial analyses.

Furthermore, the attitudes of the students and school personnel, the reading habits and patterns of the students, the home and community environments, the quantity and quality of the remedial services provided, and any extra or unusual activities in which the students were involved in during the summer and school year that may have affected summer retention and/or reading achievement should be taken into consideration to add more substance to the study. Perhaps one, or more, of these factors may have been a confounding variable in this study.

Implications for Further Research

In this study, the two criterion variables were the summer retention and reading achievement of students in the late elementary grades. The research literature presented in Chapter II suggests that the age of students is a factor which effects summer retention. Subsequently, a topic for further research would be to examine the summer retention pattern of students in junior and senior high schools. Furthermore, future research endeavors could study the effects of the summer months on the retention of other subject areas such as mathematics, language arts, science, social studies, etc. It is possible that the various summer activities of students are related to the retention of achievement in different subject areas.

Finally, the traditional organization of the school year into two semesters with a summer recess of approximately three months could be studied in comparison with the "year-round school" concept in which the calendar year is divided into quarters, and students are required to
attend school 60 days in each quarter. In other words, students attend school for 10 weeks and then have a three-week recess. The effects of this type of educational system may have a significant effect on student achievement, and subsequently, on achievement retention.