

A COMPARISON OF THE ACADEMIC ACHIEVEMENT OF HEAD
START PUPILS WITH NON-HEAD START PUPILS

APPROVED:

Graduate Committee:

R. J. Sampson

Major Professor

R. C. Bradley

Committee Member

Herman A. Newson

Committee Member

Irene Kingery

Dean of the School of Education

Robert B. Touloucy

Dean of the Graduate School

A COMPARISON OF THE ACADEMIC ACHIEVEMENT OF HEAD
START PUPILS WITH NON-HEAD START PUPILS

DISSERTATION

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

Eva Pearl Lewis, B. S., M. A.

Denton, Texas

August, 1967

TABLE OF CONTENTS

	Page
LIST OF TABLES	v
Chapter	
I. INTRODUCTION	1
Statement of the Problem	
Hypotheses	
Significance of the Study	
Definition of Terms	
Limitations of the Study	
Basic Assumptions	
Procedure for Collecting Data	
Procedure for Treating Data	
II. SURVEY OF RELATED LITERATURE	18
Introduction	
Related Research	
Summary	
III. PROCEDURES	33
Subjects	
Design	
Procedure	
Instruments	
IV. FINDINGS	43
V. DISCUSSION, SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	91
Discussion	
Summary	

	Page
Conclusions	
Recommendations	
APPENDIX	103
BIBLIOGRAPHY	105

LIST OF TABLES

Table	Page
I. An Analysis of Variance between Groups on Sub-Test Number One, Word Reading	44
II. A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Subtest Number One, Word Reading	45
III. A Comparison of the Disadvantaged Head Start Group and the Advantaged with Kindergarten Group on Subtest Number One, Word Reading	45
IV. A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Subtest Number One, Word Reading	46
V. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Subtest Number One, Word Reading	47
VI. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number One, Word Reading . .	47
VII. A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Subtest Number One, Word Reading	48
VIII. An Analysis of Variance between Groups on Subtest Number Two, Paragraph Meaning	50
IX. A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Two, Paragraph Meaning	51

Table	Page
X. A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Subtest Number Two, Paragraph Meaning	51
XI. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Two, Paragraph Meaning . .	52
XII. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Two, Paragraph Meaning	53
XIII. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Two, Paragraph Meaning	54
XIV. A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Subtest Number Two, Paragraph Meaning	55
XV. An Analysis of Variance between Groups on Subtest Number Three, Vocabulary	56
XVI. A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Three, Vocabulary	57
XVII. A Comparison of the Disadvantaged Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Three, Vocabulary	58
XVIII. A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Subtest Number Three, Vocabulary	59
XIX. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Three, Vocabulary	59

Table	Page
XX. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Three, Vocabulary	60
XXI. A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Subtest Number Three, Vocabulary	61
XXII. An Analysis of Variance between Groups on Subtest Number Four, Spelling	62
XXIII. A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Four, Spelling	63
XXIV. A Comparison of the Disadvantaged Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Four, Spelling	64
XXV. A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Subtest Number Four, Spelling	65
XXVI. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Four, Spelling	66
XXVII. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Four, Spelling	66
XXVIII. A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Subtest Number Four, Spelling	67
XXIX. An Analysis of Variance between Groups on Subtest Number Five, Word Study Skills	68

Table	Page	
XXX.	A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Five, Word Study Skills	69
XXXI.	A Comparison of the Disadvantaged Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Five, Word Study Skills	70
XXXII.	A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Subtest Number Five, Word Study Skills	71
XXXIII.	A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Five, Word Study Skills	72
XXXIV.	A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Five, Word Study Skills	72
XXXV.	A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Subtest Number Five, Word Study Skills	73
XXXVI.	An Analysis of Variance between Groups on Subtest Number Six, Arithmetic	75
XXXVII.	A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Six, Arithmetic	76
XXXVIII.	A Comparison of the Disadvantaged Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Six, Arithmetic	77
XXXIX.	A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Subtest Number Six, Arithmetic	77

Table	Page
XL. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Subtest Number Six, Arithmetic	78
XLI. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Subtest Number Six, Arithmetic	79
XLII. A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Subtest Number Six, Arithmetic	80
XLIII. An Analysis of Variance between Groups on Total Test Average	81
XLIV. A Comparison of the Disadvantaged Head Start Group and the Advantaged without Kindergarten Group on Total Test Average	82
XLV. A Comparison of the Disadvantaged Head Start Group and the Advantaged with Kindergarten Group on Total Test Average	83
XLVI. A Comparison of the Disadvantaged Head Start Group and the Disadvantaged Non-Head Start Group on Total Test Average	84
XLVII. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged with Kindergarten Group on Total Test Average	85
XLVIII. A Comparison of the Disadvantaged Non-Head Start Group and the Advantaged without Kindergarten Group on Total Test Average	86
XLIX. A Comparison of the Advantaged with Kindergarten Group and the Advantaged without Kindergarten Group on Total Test Average	87

CHAPTER I

INTRODUCTION

America today stands in need of all the human resources that can be developed by a growing and thriving democracy. Perhaps this was always the case; nevertheless, our country today is in a position of world leadership. Hence, for a democratic society such as ours, the education of all citizens is essential in helping to uphold the ideals and beliefs of a democracy.

At the present time, hundreds of thousands of preschool children have been enrolled in a program known as "Operation Head Start," specifically designed for disadvantaged children. Late in November of 1964, the program was conceived. In June of 1965, the actual implementation of the program was begun. Of all the programs for disadvantaged children, Operation Head Start is the most popular and the most widely known. Designed to be of immediate help to preschool children, the program enjoyed wide response and attention from educators and other interested persons. According to Osborne, the program attempted to provide some of the medical, nutritional, and educational advantages enjoyed by the children of more affluent parents.

Head Start attempted to give these children a better beginning in school (6, p. 101).

Poverty tends to deprive the individual child of the many things enjoyed and taken for granted by the children of more affluent parents. His physical space is smaller; the number of his toys is smaller; and his vocabulary is limited by lack of varying experiences. Operation Head Start was organized for the benefit of children from low-income families.

Academic achievement is, of course, a most important goal in our schools. From grade one to the university level, emphasis is placed upon academic achievement. Despite the fact that the school has assumed responsibility for the physical, social, and emotional development of children, academic achievement continues to be one of education's major goals. As Orton (5, p. 24) states, "Too often the first school experience is the beginning of a familiar pattern--the child loses his will to progress, and week by week falls behind until eventually he becomes a dropout."

Operation Head Start looms today as one of the mammoth educational innovations for underprivileged children of this century. The response from persons in many fields has been overwhelming. Parents and children have participated in the undertaking and have become a part of this giant undertaking.

Many people share in the teamwork necessary to carry out the Head Start program. A certified public school teacher is responsible for a classroom of about fifteen Head Start pupils. A teachers' aid works very closely with this teacher at all times. Doctors, dentists, and nurses care for the physical needs of the children. Nutrition experts plan nutritious meals. College students, high school students, parents, and even grandparents are among the persons who serve as assistants to the classroom teacher. These volunteers are useful in the preparation of materials, as guides for field trips, in helping to provide leadership for play activities, and in many other ways.

A varied program is provided for Head Start participants. A typical day will include art and craft activities, music appreciation, games, and story-telling. Stress is placed daily on conversation. Many opportunities for oral expression are provided. Trips are planned regularly to places of interest in the immediate environment and occasionally in a nearby city. A well-balanced meal and snacks are provided daily for each child.

A variety of supplies and equipment are essential for the successful operation of a Head Start program. Art supplies such as easels, paint, paper, scissors, clay boards, and crayons are examples of materials of this kind. Table activities include blocks, games, puzzles, counting frames, and peg boards. Phonographs, records, drums, tom-toms, and other musical equipment are provided. Materials for dramatic play, doll families, toy furniture, and houses, are also used. Story books of interest to preschool children are in evidence. Simple science equipment such as aquariums and terrariums, magnets, and magnifying glasses is used. In addition to the materials that are bought, volunteers are helpful in making contributions of equipment from their homes.

Funds for the Head Start program come from both federal and local sources. The federal government expects the local program to supply at least twenty per cent of the cost. The total budget is worked out by people in charge of the local program, but this budget must be approved by the federal government. The federal contribution averages \$100.00 per month per child.

Statement of the Problem

The problem of this study was to determine the difference in academic achievement between disadvantaged pupils who attended a Head Start program and those who did not when that difference was measured by a selected instrument. The groups used for the comparison were (1) Head Start, disadvantaged; (2) non-Head Start, disadvantaged without kindergarten experiences; (3) non-Head Start, advantaged with kindergarten experiences; and (4) non-Head Start, advantaged without kindergarten experiences. A comparison was made between pupils from the Head Start group and those from three non-Head Start groups, using a standardized achievement test which contained the following subsections:

1. Word Reading,
2. Paragraph Meaning,
3. Vocabulary,
4. Spelling,
5. Word Study Skills,
6. Arithmetic, and
7. A Total Test Average, which was derived from the six subsections above.

Hypotheses

1. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having Head Start experience and the advantaged pupils having no kindergarten experience.

2. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having Head Start experience and the advantaged pupils having kindergarten experience.

3. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having Head Start experience and the disadvantaged pupils having neither Head Start nor kindergarten experience.

4. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having neither Head Start nor kindergarten experience and the advantaged pupils having kindergarten experience.

5. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having neither Head Start nor kindergarten experience and the advantaged pupils having no kindergarten experience.

6. There will be no significant difference in the academic achievement in basic school subjects between the advantaged pupils having kindergarten experience and the advantaged pupils having no kindergarten experience.

Significance of the Study

The Head Start program has been a topic of discussion for much of the current literature on disadvantaged children. Of all the anti-poverty programs today, the Head Start project has received the most attention as an aid to disadvantaged pre-school children. Research studies in depth are currently in progress in many areas of the country. This study was pertinent as a new approach to the study of disadvantaged children. Pupils were grouped on the basis of family income and pre-school experiences. The Head Start group was compared with three non-Head Start groups to determine the difference in academic achievement among them. Administrators and curriculum planners should find the data useful in planning for the needs of all pupils. Since this study was conducted at the first grade level, it should be important in helping those teachers to understand more clearly the need for individual attention to pupils in their classrooms. The following references are examples of similar studies that are related to this study.

Sexton has reported that students from lower-income families often have trouble in school because of sickness and health problems. They have been found to be more likely than upper-income children to become sick or diseased or to suffer from some chronic ailment that was not treated or detected. She listed the probable reasons as being the lack of proper care and food, improper housing conditions sometimes conducive to epidemic disease, and the inability to receive medical care and attention. She states that in lower income groups there is an extremely disproportionate number of students who move out of the school area and cannot be located. The community ties of lower-income groups are so slight that families literally disappear from their neighborhoods, leaving no word or forwarding address with teachers or neighbors (8, p. 98).

Goldsmith reports that Project Head Start has thrust long overdue recognition on the early years of childhood. He states that the idea that young pre-school children are educable has been accepted. He wrote that the anticipated attendance of some 100,000 pre-schoolers in Head Start had grown by July 1, 1965, to some 625,000 youngsters across the country. Professionals from related fields, teachers of older children as well as volunteers, parents, and other untrained helpers were called on to join hands and contribute their much-needed effort and skill (2, p. 73).

On the subject of poverty programs and help for the disadvantaged child in general, Carton (7) wrote that

Data from research on the disadvantaged are needed badly to help improve the competence of educators in helping disadvantaged pupils reach their potential. Thus, there is widespread study in this area and frequently abundant allocation of funds (1, p. 109).

Carton further wrote that

If there is any contribution that the school can make to the "War on Poverty" and the building of a "Great Society" it is in the developing of its charges. The school's contribution to society is people, not manipulations and programs (1, p. 109).

Throughout the United States, Head Start operated to strengthen, in several ways, the background of the pre-school disadvantaged child. In Mississippi, Robinson (7) cited the accomplishments of 2,600 Head Start Operation Centers. He found that the operation of these centers contributed to the goal of effective education for all the children of all the people. The 200 centers in Mississippi were useful in helping to provide equal opportunities for all individuals.

Definition of Terms

The following definitions will aid in the understanding of the terminology significant in this study:

1. Head Start refers to an eight-weeks' pre-school enrichment program for disadvantaged children.

2. Non-Head Start refers to lack of participation in a pre-school enrichment program for disadvantaged children.

3. Advantaged, for the purpose of this study, is a term used to describe a group of children who did not show eligibility for participation in a Head Start program. The income of their families was above the level designated for attendance in the program.

4. Disadvantaged, for the purpose of this study, is a term used to describe a group of children who showed eligibility for participation in a Head Start program. Children who were eligible must have been six years of age on or before September 1 prior to entry into first grade. In addition, the children must have been able to meet the family income requirements following: (a) with one child, the family could not have more than \$1,500.00 in income; (b) with two children, it could have no more than \$2,000.00; (c) with three children, no more than \$2,500.00; (d) with four children, no more than \$3,000.00; (e) with five children, no more than \$3,500.00; (f) with six children, no more than \$4,000.00; (g) with seven children, not more than \$4,500.00; (h) with eight children, no more than \$5,000.00 (4).

5. Achievement Test refers to a comprehensive battery yielding separate scores in word reading, paragraph meaning, vocabulary, spelling, word study skills, and arithmetic, as measured by the Stanford Achievement Test.

Limitations of the Study

This study was limited to first grade pupils in a small city in the southwestern part of the United States. The pupils were from low- to upper-middle-income homes. Pupils who could not meet the criteria for low-income eligibility were excluded from the two disadvantaged groups. Similarly, pupils whose family income levels were above the disadvantaged groups met the criteria for the two advantaged groups. Subjects whose family incomes could not meet the criteria for the advantaged or disadvantaged groups were eliminated from the study. Pupils whose families chose not to reveal the family income status were also eliminated from the study.

Basic Assumptions

For this study, it was necessary to assume that the two groups-- Head Start, disadvantaged, and non-Head Start, disadvantaged without kindergarten experiences, would have similar intelligence quotients. Further, it was assumed that the above named groups were from homes of comparable economic status. Another assumption was that the two groups--non-Head Start, advantaged with kindergarten experiences, and non-Head Start, advantaged without kindergarten experiences, would have similar intelligence quotients. An assumption was made, too, that these two groups were from homes of comparable economic status.

The assumption was made that it is possible to assess achievement in school work. Achievement today can be identified and measured with the use of standardized instruments.

Procedure for Collecting Data

The subjects for this study were two hundred sixty-three first grade pupils. The children were divided into four groups. The group composition consisted of fifty-eight Head Start pupils, disadvantaged, fifty non-Head Start pupils, disadvantaged without kindergarten, seventy-seven non-Head Start pupils, advantaged with kindergarten, and seventy-eight non-Head Start pupils, advantaged without kindergarten experiences.

Permission to conduct the study in this particular school district was granted by the district's superintendent and his administrative assistant. A total of five conferences was held in order to complete details needed for permission to carry out the study in this school district.

During the month of May, The Stanford Achievement Test was given in every elementary school of the city. The tests were administered and scored by the child's regular classroom teacher. Eight schools were used in the study, and a total of eighteen teachers was involved. Data relative to the pupil's age, sex, race, and the

Stanford Achievement Test results were obtained from the files of the classroom teacher or from the principal's office.

The Head Start, disadvantaged, pupils were identified in these ways: (a) an official list of all Head Start pupils in the city was obtained from the Head Start Director; (b) an official list was supplied by the Public Health Nurse to identify pupils by schools; (c) the classroom teachers identified their Head Start pupils from their classroom records. Pupils were identified for the Head Start program by their family incomes and by their age eligibility. Letters were sent to the parents in order to determine the eligibility of their children for Head Start participation.

The non-Head Start, disadvantaged, group was identified by the same family income scale as was the Head Start, disadvantaged, group. The data regarding their incomes established their eligibility for Head Start, but these pupils had not chosen to participate in the program. The non-Head Start, advantaged with kindergarten experiences, group and the non-Head Start, advantaged without kindergarten, groups were identified by their failure to show eligibility for Head Start participation. Letters were sent to the parents, requesting information relative to the child's name, age, sex, the number of siblings in the family, and the family's approximate income. The

return of these forms was kept on a voluntary basis. Parents who did not wish to return the forms or to reveal family income were given this choice.

The instrument used in collecting data for each of the four groups was the Stanford Achievement Test--Primary I Battery. This test is ordinarily used near the end of the first grade for measuring academic achievement in Grade One. The test yields a total of seven scores based on the divisions which follow:

1. Word Reading,
2. Paragraph Meaning,
3. Vocabulary,
4. Spelling,
5. Word Study Skills,
6. Arithmetic, and
7. A Total Test Average (3).

Procedure for Treating Data

Statistical Technique

The statistical technique used to treat the data was the simple analysis of variance between the groups. When significant differences were found in the analysis of variance, Fisher's t was used to test the differences between the means. The groups were designated

as (a) Head Start, disadvantaged; (b) non-Head Start, disadvantaged without kindergarten experiences; (c) non-Head Start, advantaged with kindergarten experiences; and (d) non-Head Start, advantaged without kindergarten experiences.

Statistical Steps

The statistical steps involved in testing all six hypotheses required computing the separate means, the standard deviations, the differences in the means for each group, and the testing of the significance of the difference between the means of each group by means of the Fisher's t test.

Hypothesis 1 was tested by comparing scores of children from the Head Start, disadvantaged, subjects with those from the non-Head Start, advantaged without kindergarten experiences, subjects on the Stanford Achievement Test through a test of significance between the means, using the Fisher's t.

Hypothesis 2 was tested by comparing scores of children from the Head Start, disadvantaged, with those from the non-Head Start, advantaged with kindergarten experiences, subjects on the Stanford Achievement Test through a test of significance between the means, using the Fisher's t.

Hypothesis 3 was tested by comparing the scores of pupils from the Head Start, disadvantaged, group with those from the non-Head Start, disadvantaged, subjects on the Stanford Achievement Test through a test of significance between the means, using the Fisher's t.

Hypothesis 4 was tested by comparing the scores of pupils from the non-Head Start, disadvantaged, subjects and the non-Head Start, advantaged with kindergarten experiences, subjects on the Stanford Achievement Test through a test of significance between the means, using the Fisher's t.

Hypothesis 5 was tested by a comparison of the scores of pupils from the non-Head Start, disadvantaged, subjects with those of the non-Head Start, advantaged without kindergarten experiences, subjects on the Stanford Achievement Test through a test of significance between the means, using the Fisher's t.

Hypothesis 6 was tested by comparing the scores of pupils from the non-Head Start, advantaged with kindergarten experiences, subjects with those from the non-Head Start, advantaged without kindergarten experiences, subjects on the Stanford Achievement Test through a test of significance between the means, using the Fisher's t.

CHAPTER BIBLIOGRAPHY

1. Carton, Aaron S., "Poverty Programs--Civil Rights and the American School," School and Society, XCV (February, 1967), 108-109.
2. Goldsmith, Cornelia, "Our Concerns for Young Children Today," Young Children, XXII (November, 1966), 71-77.
3. Kelley, Truman L. and others, Stanford Achievement Test, Primary I, New York, Harcourt, Brace and World, Inc., 1964.
4. Office of Economic Opportunity, "How to Apply for a Head Start Child Development Program," Community Action Program, Washington, Government Printing Office, 1965.
5. Orton, Richard E., "We're Past the Trial Run," Instructor, LXXVI (December, 1966), 24-26.
6. Osborne, Keith, "Project Head Start--An Assessment," Educational Leadership, XXXIII (November, 1965), 98-101.
7. Robinson, Donald P., "Head Starts in Mississippi," Phi Delta Kappan, XLVII (October, 1965), 91-95.
8. Sexton, Patricia C., Education and Income, New York, The Viking Press, 1961.

CHAPTER II

SURVEY OF RELATED LITERATURE

Introduction

Operation Head Start is currently the topic of many research projects. While longitudinal studies may be delayed for some time because of the recency of the program, many preliminary reports have been made. The studies point to the successful and not-so-successful results obtained from programs heretofore completed.

The review of related research should include results of programs which operated to serve Head Start participants. Principally, the related research should describe Head Start programs which have been wholly completed. Since Head Start pupils are often referred to as disadvantaged, the review should include studies on the disadvantaged or underprivileged child. In this study, Head Start participants were compared with other disadvantaged and advantaged pupils. Hence, research on kindergarten and other pre-school programs should be included.

Related Research

Qualified observers have considered Operation Head Start a success. Following the use of various testing projects and their

evaluation, Maggins (16) reported considerable improvement in the Head Start child's ability to work, play, and get along with others.

Eisenberg (7) reported research which showed that children enrolled in the Baltimore Head Start Program in 1965 made substantial progress in attributes related to subsequent school success. Raw scores on the Peabody Picture Vocabulary Test of a control group whose families had not elected to register their children in Head Start did not differ significantly from those of Head Start children prior to their summer's experience. Significant gains were registered by Head Start children at the end of the summer program, and these children scored further gains upon entering first grade. Although the greatest gains were scored by children with the lowest initial scores, there was a consistent trend toward higher scores in all quartiles.

Wright (20) found evidence of improved test scores of children who had attended the Head Start Program. Eighty-three of 107 pupils were given the Metropolitan Readiness Test. Test scores showed a median beginning percentile score of sixteen. With the final test, this score had increased to a median percentile of forty-two, indicating that the group had made substantial gains based on the published norms for kindergarten pupils.

Other studies were not directly related to test scores of academic achievement. They are important, however, in understanding other variables needed for success in school work. For example, Broman (2) conducted a study of parental reactions to Head Start. He concluded his study by stating that the following changes were made by children who had attended Head Start:

1. Head Start brought about a change in behavior at home of many children.
2. Trips to the airport and other places helped to achieve a wider interest in the children's environment.
3. More readiness for first grade was observable.
4. The parents showed greater interest in their children's school activities (2, p. 483).

Sugarman (17), Associate Director of Head Start, reported the following principal findings in Head Start Programs in Nashville, Tennessee:

1. These children were more self-assured and poised in relationships with adults and others.
2. They exhibited more purpose in what they did.
3. Those with Head Start experiences showed many signs of readiness to read.
4. The percentage of all beginners who ranked as "poor risks" on the basis of Metropolitan Readiness Tests was reduced from between forty and sixty per cent to twenty-four per cent (17, p. 116).

Giles (8) compared the oral language development of Head Start pupils with non-Head Start pupils. In the concluding section of his study, he wrote, in part,

Project Head Start activities did enhance the oral language development of participating students. Pupils having these experiences were more advanced in the area of length of sentences, use of words from the advanced vocabulary lists, use of the Noun-Linking, Verb-Noun sentence pattern, lack of use of partial or incomplete sentences, use of expressions of tentativeness, and use of vivid and colorful expressions (8, p. 45).

Various studies have been conducted on children of different socio-economic backgrounds. John (12) examined certain patterns of linguistic and cognitive behavior in a sample of Negro children from various social classes. The children from lower-class backgrounds relied on shorter sentences in their speech than did their middle-class age-mates. They also exhibited a more limited vocabulary and poorer articulation. Investigators have hypothesized that these differences are partially due to the more restricted nature of the environment in which children from lower class homes are raised. He concluded that the middle-class child has an advantage over the lower-class child in tasks requiring precise and somewhat abstract language. Opportunities for learning to categorize and integrate are rare in the lives of all children; this type of learning requires specific feedback or careful tutoring. Such attention is less available to the lower-class child (12, p. 814).

Other authorities have studied the unwholesome effects of failure to provide for the disadvantaged child in society. On this subject,

Havighurst (10) wrote,

How many of the gifted children found in the schools will realize their potential and become distinguished persons, contributing in an outstanding way to the welfare of their society and gaining for themselves the satisfactions of excellent performance? Under present conditions, certainly less than half of them will do so (10, p. 20).

Brunner (4) attempted to evaluate the experiences gained in a pre-school enrichment program and found that this is only the first step toward enabling a child from an impoverished environment to start developing the ideas and language that constitute the raw materials for learning. She felt that continued attention to their needs throughout the total school experience is of vital importance if the initial gains made are to endure.

Lee (15) found a large number of empirical studies to support the assumption that certain environmental conditions may retard intellectual development. He maintained that with the proper environmental conditions disadvantaged children do learn and that intelligence quotients increase by forty points or more. In 1951, he investigated the relationships between intelligence test scores of Negro children and the length of time spent in Northern schools. He retested the children after varying periods of time in the North. He states that the group which had attended kindergarten averaged consistently higher than the group which entered first grade with no pre-school experience.

Within each of the Philadelphia-born groups there was no consistent tendency for scores to rise upon retesting. In each of the groups that had migrated to the city, there was a significant tendency for mean scores to increase with increasing length of Northern residence. The earlier the entry, the higher the intelligence quotient in any one grade.

Brazziel and Terrell (1) conducted an experiment in the development of readiness in a culturally disadvantaged group of first graders. They reported on a six-weeks readiness program for twenty-six Negro first grade children. The program included parental meetings once a week, thirty minutes of educational television watched in the home, and a readiness program to develop vocabulary perception, word reasoning, and ability to follow directions. At the end of the six weeks, the experimental classes had reached the fiftieth percentile on readiness, as measured by the Metropolitan Readiness Test, while the non-experimental classes in the same school were at the fifteenth percentile. The difference was significant. The average intelligence quotient after seven months for the experimental class was 106.5; the general expectation for the group was ninety.

Bruner (3) believes in intervention. To him readiness is practically an unnecessary term. He feels that children are always ready

for new concepts. Bruner makes the following suggestions:

The foundation of any subject may be taught to anybody at any age in some form. Once the structure is learned, individual facts may be forgotten, since they are easily reconstructed into the system. This is particularly important for the disadvantaged youngster because he, more than any other child, needs the basic tools, the basic concepts of the physical and social world, those that can be transferred from one subject to another. He needs a way of thinking and solving problems that is flexible. He needs "short cuts" and the mastery of structure is such a short cut (3, p. 12).

More recently, Gray and Klaus (9) reported on the Early Training Project in the Murfreesboro, Tennessee, public schools. The Early Training Project involved two experimental groups, each consisting of approximately twenty culturally deprived children. The two groups were T1, which offered school programs for two successive summers and home contact for the intervening year and in which the children started at approximately three and one-half years of age, and T2, which offered one summer program for children of approximately five years of age. There were two matched control groups. The program was aimed at improving attitudes toward achievement and attitudes and abilities (language, perception, and concept formation) considered necessary for successful school learning. Results of pretesting and posttesting over a fifteen-months period showed significantly greater improvement on Binet and Peabody Picture Vocabulary Test for

experimental groups than for control groups. Average intelligence quotient gains were 10.1 points for experimental group T1 (from 85.6 to 95.7) and 5.1 points for experimental group T2 (from 91.2 to 96.3).

Hyman and Kliman (11) investigated the readiness of children who had participated in Head Start programs and one year of kindergarten. Previous studies of the group discussed had demonstrated statistically significant immediate gains in intelligence scores associated with a six weeks summer experience in Head Start. The results of the follow-up, which was part of a more extensive longitudinal study, indicated that the group of children who had Head Start experiences did not score significantly higher on the Metropolitan Readiness Test when they were compared with a control group which did not participate in Head Start. Hyman and Kliman made the following statements:

The gains accrued as a result of Head Start are not sufficiently reinforced and consolidated. Many of these children will not benefit from traditional educational programs. Affective and cognitive learnings will not result at the expected rate due to motivational and emotional inhibitions associated with continual experiences of failure (11, p. 166).

Widmer (18) has studied the importance of kindergarten and found the following characteristics to be evinced by those children who have spent a full year in kindergarten:

1. The team work between home and school which is encouraged helps to make the child's transition to his beginning school experience an easier one.
2. General adjustment to school is facilitated by the gradual transition between home and school stressed in the activities and focus of the kindergarten.
3. A good year in kindergarten in which a broad program of activities is carried on, adequate materials and equipment are available, and satisfying relationships are experienced is a good foundation upon which to build later experiences.
4. The encouragement of the child's total development, i. e., physical, mental, social, and emotional, is an aid to his further growth and development.
5. The readiness activities stressed are helpful in the child's transition to the more formal activities of the first grade program, and the later grades.
6. The foundation of favorable attitudes toward the educational program and school is encouraged, which pays dividends in his feelings about school in the later grades.
7. Personality development and social adjustment are further experiences and guidance in group living (18, p. 212).

Criscuolo (6) studied deficiencies of culturally disadvantaged children in the primary grades. He found a general lack of experiences related to readiness for reading. He found, too, that upon entry to first grade, many of these children were not ready to begin a formal program in reading. He advocated a rich program in language development activities in order to compensate for deficiencies. He further found that word meanings and the correct usage of words present problems to disadvantaged children in the classroom. Criscuolo stated that there appears to be a lack of manipulative materials in

many of the homes of disadvantaged children. A portion of his study established the fact that great numbers of children in the low socioeconomic level were penalized because of their inability to follow directions.

Cartwright and Steglich (5) conducted a study at Lubbock, Texas. The purpose of the study was to determine the effectiveness of a summer Head Start program there. To conduct the study, the performance of Head Start children was compared with that of a non-Head Start group with similar social characteristics. The findings were as follows:

1. In general, the findings of the study do not show an overwhelming success of the Head Start program in its primary stage in Lubbock. Inconclusive results show a superiority of the control group on some items and superiority of Head Start children on others.
2. Specifically, the outcome showed that 1) Boys showed more gain from Head Start experiences than did girls (significant at the .05 level). 2) Minority group boys evidenced more gain than Anglo-American boys. 3) Children of working mothers, especially Negroes, showed more gain than children from homes in which the mother does not work.
3. The hypothesis that children from homes of higher status levels, as measured by the father's occupation, would perform better than those of lower status levels was supported. This was true in general, especially with the girls.
4. The boys who showed gain from Head Start were those from families in which the need for improvement is greatest, that is, from families of the lowest income and lowest occupational level of the father (5, p. 32).

Wolff and Stein (19) compared kindergarten children who had participated in the Head Start program with their classmates who had not. Four measures of social and educational readiness were selected for comparisons; they were the child's initial adjustment to classroom routines and length of time it took him to become fully adjusted to school routines; his behavior toward his peers and toward the teacher; his speech, work habits and listening habits; and his educational attainment. The findings were as follows:

1. Of the 14 teachers interviewed, nine felt that any initial advantage in social adjustment to school evidenced by the Head Start children had disappeared after the first few months of kindergarten. Of the four teachers who thought the advantage had persisted, three had been closely associated with the Head Start program, two as directors and one as a teacher in the program. One teacher attributed any later advantage or disadvantage solely to the individual Head Start teacher the child had.
2. There was no significant difference between the scores of Head Start children and their classmates in kindergarten who did not have Head Start, as measured by the pre-school inventory six to eight months after the summer Head Start experience.
3. There was almost unanimous agreement by the teachers that Head Start children helped the whole class adjust to the regular school routine. Only two teachers felt they made no difference in the speed of classroom adjustment to routines (19, p. 350).

In other Head Start programs encouraging signs of success have been observed. At the University of Texas, Jones and others (13) found Head Start children to be more proficient in learning, more

intellectually curious, and better adjusted to the classroom than children who had not participated in the program. Knoll (14) investigated gains in the Clovis, California, Montessori Schools. Pre-school children who had participated in a six-weeks Head Start program showed a gain of four to twelve months in intelligence scores. Children who had the lowest scores initially made the greatest gains.

Summary

Studies related to this research have dealt mainly with pre-school enrichment programs and their evaluation. Bruner (3) and Brunner (4) both reported on the importance of intervention at the pre-school level. Gray and Klaus (9) in evaluating an Early Training Project pointed out differences in control and experimental groups of culturally deprived children. These three studies tend to show the need for enrichment at the pre-school level.

Other research studies have been concerned with disadvantaged children. Brazziel and Terrell (1) reported improved test scores following a readiness program for disadvantaged first grade children. A few studies (6, 10, 15) analyzed certain problems of the disadvantaged child. From these studies, it appears that the disadvantaged child has deficiencies which are not easily overcome.

Preliminary reports on the Head Start program are given by some authorities. While some studies reported improved test scores for pupils enrolled in Head Start (7, 20), others (5, 11) did not report overwhelming success. A few studies cited improved attitudes and behavior of children who were participants in Head Start (2, 17). Further research seems to be necessary before conclusive results can be reported on the value of the Head Start program.

CHAPTER BIBLIOGRAPHY

1. Brazziel, William F., "Two Years of Head Start," Phi Delta Kappan, XLVIII (March, 1967), 344-348.
2. Broman, Betty, "Parents' Reaction to Head Start," Childhood Education, XLII (April, 1966), 483-486.
3. Bruner, Jerome S., The Process of Education, Cambridge, Harvard University Press, 1960.
4. Brunner, Catherine, "Preschool Experiences for the Disadvantaged," The Educationally Retarded and Disadvantaged, Sixty-sixth Yearbook of the National Society for the Study of Education, Part I (Chicago, 1967).
5. Cartwright, Walter J., and W. G. Steglich, "Where the Need Is Greatest," Texas Outlook, LI (April, 1967), 32-33.
6. Criscuolo, Nicholas P., "Pre-Reading Activities in the Primary Grades," Arizona Teacher, LVI (November, 1966), 12.
7. Eisenberg, Leon, "Progress Report: Office of Economic Opportunity," Educational Leadership, XXIV (October, 1966), 39-45.
8. Giles, Douglas E., A Comparison of the Oral Language Development of Head Start Pupils with Non-Head Start Pupils, A Research Report, Washington, U. S. Department of Health, Education and Welfare, 1966.
9. Gray, Susan W. and R. A. Klaus, "Interim Report: Early Training Project," unpublished report, George Peabody College, Murfreesboro, Tennessee, 1963.
10. Havighurst, Robert J., "Conditions Favorable and Detrimental to the Development of Talent," School Review, LXV (Spring, 1957), 20-26.

11. Hyman, Irwin A., and Deborah Sill Kliman, "First Grade Readiness of Children Who Have Had Summer Head Start Programs," The Training School Bulletin, LXIII (February, 1967), 163-167.
12. John, Vera P., "The Intellectual Development of Slum Children," American Journal of Ortho Psychiatry, XXXIII (October, 1963), 813-822.
13. Jones, G. W., "Compensatory Education for the Disadvantaged," NEA Journal, LVI (April, 1967), 21-23.
14. Knoll, Erwin, "Head Start Limp Along to Popularity," Southern Education Report, II (July-August, 1966), 8-9.
15. Lee, E. S., "Negro Intelligence and Selective Migration, A Philadelphia Test of the Klineberg Hypothesis," American Sociological Review, XVI (February, 1951), 227-233.
16. Maggins, Donald L., "Will Success Spoil Head Start?" Education Digest, XXXI (April, 1966), 7-9.
17. Sugarman, Jules, "Head Start or False Start?" Grade Teacher, LXXXIV (December, 1966), 84, 116-119.
18. Widmer, E. L., "Why Kindergarten?" Peabody Journal of Education, XLIV (January, 1967), 210-215.
19. Wolff, Max, and Annie Stein, "Head Start Six Months Later," Phi Delta Kappan, XLVIII (March, 1967), 349-350.
20. Wright, W. P., "Poor Given Head Start in Abilene," American School Board Journal, CLII (May, 1966), 14.

CHAPTER III

PROCEDURES

The method used in this study was a comparison of four groups of first-grade children. The groups consist of (1) Head Start, disadvantaged; (2) non-Head Start, disadvantaged without kindergarten; (3) non-Head Start, advantaged with kindergarten; and (4) non-Head Start, advantaged without kindergarten. The purpose of the analysis was to determine the difference in academic achievement between pupils who attended an eight-weeks' Head Start enrichment program when compared with three non-Head Start groups. For each of the four groups above, family income and preschool experiences (or lack of them) were used as the criteria for selection of the groups. Only a few studies dealing with this problem in depth have been completed (3, 4, 8). Other studies have been made with underprivileged, preschool children (2, 5) as subjects. The pupils used in this study were from first-grade classrooms only. Pupils were assigned to the Head Start, disadvantaged, group only if they qualified as Head Start enrollees and were in attendance in an eight-weeks' Head Start program prior to their entry into first grade. Pupils were assigned to the non-Head

Start, disadvantaged, group only if they qualified as Head Start enrollees but were not in attendance in an eight-weeks' Head Start program prior to their entry into first grade. Pupils were assigned to the non-Head Start, advantaged with kindergarten, group only if they did not qualify for the Head Start program and attended kindergarten prior to entering first grade. The non-Head Start, advantaged without kindergarten, group received assignment to this group only if they did not qualify for the Head Start program and only if they did not attend kindergarten prior to entering first grade. A survey of the literature did not reveal a comparison of four groups of children with and without preschool experiences as planned for this research project.

Subjects

The subjects were 263 first-grade children from a small Texas city with a population of approximately 32,000. There were 141 boys and 122 girls involved in the study. The racial composition was Caucasian (188), Negro (sixty-five), and Latin-American (ten). Eight elementary schools were used. There was one predominantly Negro school, four integrated schools, and three schools with Caucasian pupils only. The Head Start, disadvantaged, pupils were fifty-eight in number. For the non-Head Start, disadvantaged, subjects there were fifty pupils. For the non-Head Start, advantaged with

kindergarten, there was a total of seventy-seven pupils. The non-Head Start, advantaged without kindergarten, group contained a total of seventy-eight pupils.

Since the heart of the study was the Head Start group, an effort was made to locate all Head Start pupils. From the official Head Start Director's list, a total of seventy-eight names was located. These children registered as participants for the Head Start program during the summer of 1966. They were divided among five teachers into groups of seventeen pupils or less. Of the seventy-eight participants in the Head Start program, fifty-eight were tested in May, 1967, by the Stanford Achievement Test. Fourteen pupils had moved away from the city. Four were ill and unable to complete the test, and two had physical handicaps which prevented them from having the test administered. The other three groups were selected on the basis of their preschool experiences (or lack of them) and the family income. In cases where the subjects were not identifiable by the stated criteria, they were eliminated from the study. All of the pupils were at least six years old by September first for the 1966-1967 school session. There were fifteen repeaters. No IQ test was given at the beginning of the school term. The Metropolitan Readiness Test was used in each of the eight schools to determine the pupils' ability to cope with first-grade work.

The children were all from self-contained classrooms. In all of the classrooms, an effort was made to keep each teacher's enrollment under thirty pupils. The average class size was approximately twenty-eight pupils. Four schools had first-grade classes with twenty-five pupils or less. The pupils were chosen for participation in this study by data collected from a form sent to the parents of each child within the first-grade classroom. The letter contained a short introduction to the parents relative to the pending study which was being conducted in the city. The pupils were selected for a group according to family income and by their preschool experiences or lack of them. No attempt was made to separate pupils according to IQ or relative standing in their classes. The pupils came from homes where the income level was from low- to upper-middle. Head Start pupils were identified by their participation in the Head Start program. All of these children were located and were made participants of the study unless illness, physical handicaps or relocation in another community had occurred. Pupils were used for the other three groups if information concerning family income could be secured. They, too, were unable to participate if illness, physical handicaps, or relocation prevented the completion of tests. A range in family income of above \$1,500.00 (not more than one child in the family) to above \$30,000.00 was used for the two advantaged groups.

Design

The design of this study was a comparison of four groups of first-grade children. The groups were selected on the basis of family income and according to their preschool experiences. The pupils were at least six years old upon entry to first grade, and there were fifteen who were repeaters. All pupils included in the study were in first-grade classrooms and were from homes where income levels ranged from low-to-upper-middle-class levels. No IQ scores were available. The groups used for comparison were four in number: (1) Head Start, disadvantaged; (2) non-Head Start, disadvantaged without kindergarten; (3) non-Head Start, advantaged with kindergarten; and (4) non-Head Start, advantaged without kindergarten. Groups were compared in the following manner: one and four, one and three, one and two, two and three, two and four, and three and four. This order of group comparisons is stated in the Hypotheses section. Comparisons were made between the groups on word reading, paragraph meaning, vocabulary, spelling, word study skills, arithmetic, and total test average.

Procedure

For the purpose of this study, a letter was sent to the parents of each child. This letter was approved by the administrators of

the city school system. In order that they might be sent from the individual schools, the letters were signed by the principal and sent to the first-grade classroom teacher. The teachers explained to pupils that this was a letter to be taken home to the parents. The parents were to fill in the blanks, sign the letter, and return it to their regular classroom teacher. The children were encouraged to return the letters the following day; however, the return of each letter was left on a voluntary basis. The principals of the schools felt that voluntary participation in the study would be the most desirable procedure for their schools. Eight schools were used in the study. While an attempt was made to send all letters on the same day, the plan was not feasible. The distribution of the letters and envelopes lasted over a three-day period. After the principals' signatures were appended, the letters were sent to the individual classrooms. The letters contained the following information:

1. The child's complete name
2. Age
3. Grade
4. Birthdate
5. Mother's name
6. Father's name
7. Home address

8. Number of children in family
9. Telephone number
10. Teacher's name
11. The question was asked if the child had attended nursery school.
12. Similarly, the question was asked if the child had attended kindergarten. The directions for questions 11 and 12 required circling of the word yes or no.
13. Family income (approximate) was checked.

The following information was obtained from the classroom teacher's records:

1. Achievement Test results
2. Race
3. Names of Head Start pupils
4. A list of the repeaters

Before the administration of standardized tests in the city, representatives from various companies were invited to discuss their tests with the teachers. Each representative discussed the values of his particular test. In addition, a discussion on good test procedures and directions for administering tests was included. A committee was formed to decide on a standardized test instrument for the city.

The committee was headed by the city's administrative leadership. Since that time, classroom teachers, especially first-grade teachers, have administered and scored their own tests. This procedure is supported by Ahmann and Glock, who state, "In most instances, however, the classroom teacher administers the test to his classes. There are advantages to this procedure. Because the teacher knows his pupils, he can more effectively motivate them" (1, p. 499).

Instrument

The Stanford Achievement Test was administered in May to all of the first-grade pupils. This is a group test and was given to the pupils by the regular classroom teacher. Prior to the actual testing, preliminary measures were taken to assure that adequate conditions prevailed. A "Testing, Do Not Disturb" sign was placed on the door. Pupils were asked to clear their desks, and space was provided for pupils to work apart from each other. Each pupil was provided with two sharpened pencils. The teacher kept a supply of pencils on his desk. Pupils were asked to raise their hands if there was need for an extra pencil. Specific directions for administering the test were followed from the Directions for Administering Primary I Battery (7, pp. 6-26).

The Stanford Achievement Test--Primary I Battery--1964 (6) is a measure of pupil achievement in the following areas:

1. Word Reading
2. Paragraph Meaning
3. Vocabulary
4. Spelling
5. Word Study Skills
6. Arithmetic
7. Total Test Average

The authors sought the content validity by examining appropriate courses of study to determine the skills, knowledge, and understanding needed. The tests are reliable in terms of grade scores for each subject in the battery for a random sample of 1,000 pupils in grade one (6, p. 30). The purpose of the test was to provide dependable data concerning achievement in important skill and content areas.

CHAPTER BIBLIOGRAPHY

1. Ahmann, Stanley J., and Marvin D. Glock, Evaluating Pupil Growth, Boston, Allyn and Bacon, Inc., 1963.
2. Brunner, Catherine, "Preschool Experiences for the Disadvantaged," The Educationally Retarded and Disadvantaged, Sixty-sixth Yearbook of the National Society for the Study of Education, Part I (Chicago, 1967).
3. Cartwright, Walter J., and W. C. Steglich, "Where the Need Is Greatest," Texas Outlook, LI (April, 1967), 32-33.
4. Giles, Douglas E., A Comparison of the Oral Language Development of Head Start Pupils with Non-Head Start Pupils, A Research Report, Washington, United States Department of Health, Education, and Welfare, 1966.
5. John, Vera P., "The Intellectual Development of Slum Children," American Journal of Ortho Psychiatry, XXXIII (October, 1963), 813-822.
6. Kelley, Truman L., and others, Stanford Achievement Test, Primary I Battery, New York, Harcourt, Brace and World, Inc., 1964.
7. _____, Stanford Achievement Test, Primary I Battery, "Directions for Administering," New York, Harcourt, Brace and World, Inc., 1964.
8. Osborne, Keith, "Project Head Start--An Assessment," Educational Leadership, XXXIII (November, 1965), 98-101.

CHAPTER IV

FINDINGS

The statistical technique used to treat the data was a simple analysis of variance test for significant differences between the four groups. If no significant differences were found, then the null hypothesis was accepted, and no further statistical steps were required. However, if significant differences were found, this indicated only that there were significant differences between two or more groups. Therefore, the appropriate t test was used to determine the location of the differences in the six possible interactions between the four groups. For both the analysis of variance and the Fisher's t the .05 level of significance was used. Although the hypotheses were formulated in regard to total achievement, the scores on each of the subtests were examined.

Word Reading

An analysis of variance is given below for Subtest Number One, Word Reading.

An analysis of variance in Table I was made on comparisons of the subtest, Word Reading, from the Stanford Achievement Test on

TABLE I
AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON SUBTEST
NUMBER ONE, WORD READING

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F	Levels of Significance
Between	12.2424	3	4.0808	14.9699	SD*
Within	70.6039	259	.2726		
Total	82.8464	262			

*Significant difference

four groups of first grade children. The result showed that there was a significant difference at the .05 level in one or more of the six comparisons between the four groups. Since a significant difference was indicated, it was necessary to use the Fisher's t between the groups to determine which of the six comparisons were significantly different.

The following six tables present the data which indicate, according to Fisher's t , whether significant differences were present in each of the six comparisons between the four groups.

When disadvantaged Head Start and the advantaged without kindergarten groups were compared (See Table II), a significant difference was found in favor of the latter group. The mean for the disadvantaged Head Start group was 1.7241, with a standard deviation

TABLE II

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER ONE, WORD READING

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
1	58	1.7241	.5963		
4	78	2.0038	.4572	-3.0898	SD

of .5963. The mean for the advantaged without kindergarten group was 2.0038, with a standard deviation of .4572. This difference was significant at better than the .05 level.

In Table III, a comparison of the disadvantaged Head Start group and the advantaged with kindergarten group on Word Reading shows a significant difference in favor of the latter group. The mean for the disadvantaged Head Start group was 1.7241, and the standard

TABLE III

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER ONE, WORD READING

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
1	58	1.7241	.5963		
3	77	2.1038	.5664	-4.1834	SD

deviation was .5664. The Fisher's t was 4.1838. The difference is significant at better than the .05 level.

In Table IV, a comparison of the disadvantaged Head Start group and the disadvantaged non-Head Start group was 1.7241, and the

TABLE IV

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE DISADVANTAGED NON-HEAD START GROUP ON SUBTEST NUMBER ONE, WORD READING

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.7241	.5963		
2	50	1.5400	.4233	1.8275	NSD*

*NSD indicates no significant difference

standard deviation was .5963. The mean for the disadvantaged non-Head Start group was 1.5400, and the standard deviation was .4233. The Fisher's t was reported at 1.8275. This difference was not significant at the .05 level. The mean for the disadvantaged Head Start group was slightly higher.

Table V shows a comparison of the disadvantaged non-Head Start group and the advantaged with kindergarten group on Word Reading. A significant difference was found in favor of the latter group. The mean for the disadvantaged non-Head Start group was 1.5400, and the

TABLE V

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER ONE, WORD READING

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
2	50	1.5400	.4233		
3	77	2.1038	.5664	-5.9465	SD

standard deviation was .4233. The mean for the advantaged with kindergarten group was 2.1038, and the standard deviation .5664. Fisher's t was -5.9465. The level of significance was better than the .05 level.

In Table VI, a comparison is made between the disadvantaged non-Head Start group and the advantaged without kindergarten group. The mean for the disadvantaged non-Head Start group was 1.5400, and the standard deviation was .4233. The mean for the advantaged

TABLE VI

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER ONE, WORD READING

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
2	50	1.5400	.4233		
4	78	2.0038	.4572	-4.9038	SD

without kindergarten group was 2.0038, and the standard deviation was .4572. Fisher's t was 4.9038. The groups were significantly different at better than the .05 level in favor of the latter group.

In Table VII, a comparison is made between the advantaged with kindergarten group and the advantaged without kindergarten group on Word Reading. The mean for the advantaged with kindergarten

TABLE VII

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER ONE, WORD READING

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.1038	.5664		
4	78	2.0038	.4572	1.1928	NSD

group was 2.1038, and the standard deviation was .5664. The mean for the advantaged without kindergarten group was 2.0038, and the standard deviation was .4572. Fisher's t was 1.1928. This difference between the two groups was not significant at the .05 level.

Summary

An analysis of variance has been made on the Stanford Achievement Test, Primary I Battery, of Subtest Number One, Word Reading,

for four groups of first grade children. Significant differences were found between two or more groups. Hence, it was necessary to use the Fisher's t test to determine the differences in the six comparisons of four groups of children.

In each instance, where comparisons of scores on Word Reading were made between the disadvantaged groups, with and without Head Start, and the advantaged groups, with and without kindergarten, statistically significant differences were found in favor of the advantaged groups.

Where comparisons of scores on Word Reading were made between the two advantaged groups, with and without kindergarten, no significant differences were found. Similarly, where comparisons of scores on Word Reading were made between the two disadvantaged groups, with and without Head Start, no significant differences were found between them. However, the mean was slightly higher for the disadvantaged Head Start group when compared with the disadvantaged non-Head Start group. The mean for the advantaged with kindergarten was slightly higher when compared with the advantaged without kindergarten group.

Paragraph Meaning

An analysis of variance is given below for Subtest Number Two, Paragraph Meaning.

An analysis of variance in Table VIII was made on comparisons of the subtest, Paragraph Meaning, from the Stanford Achievement Test on four groups of first grade children. The result showed that

TABLE VIII

AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON SUBTEST
NUMBER TWO, PARAGRAPH MEANING

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F'	Levels of Significance
Between	20.2438	3	6.6479	20.5761	SD
Within	83.6271	255	.3279		
Total	103.8709	258			

there was a significant difference at the .05 level in one or more of the six comparisons between the four groups. Since a significant difference was indicated, it was necessary to use the Fisher's t between the groups to determine which of the six comparisons were significantly different.

The following six tables present the data which indicate, according to Fisher's t, whether significant differences were present in each of the six comparisons between the four groups.

When the disadvantaged, Head Start, and the advantaged without kindergarten groups were compared in Table IX, a significant difference

TABLE IX

A COMPARISON OF THE DISADVANTAGED HEAD START GROUPS AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER TWO, PARAGRAPH MEANING

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.7140	.4434	-4.0091	SD
4	78	2.1141	.5427		

was found in favor of the latter group. The mean for the disadvantaged Head Start group was 1.7140 with a standard deviation of .4434. The mean for the advantaged without kindergarten group was 2.1141, with a standard deviation of .5427. Fisher's t was -4.0091. This difference was significant at better than the .05 level.

In Table X, a comparison of disadvantaged Head Start and the disadvantaged non-Head Start groups on Paragraph Meaning shows

TABLE X

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE DISADVANTAGED NON-HEAD START GROUP ON SUBTEST NUMBER TWO, PARAGRAPH MEANING

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.7140	.4434	1.3500	NSD
2	50	1.5617	.3291		

a significant difference in favor of the latter group. The mean for the disadvantaged Head Start group was 1.7140, and the standard deviation was .4434. The mean for the disadvantaged non-Head Start group was 1.5617, with a standard deviation of .3291. The Fisher's t was 1.3500. The difference was not significant.

In Table XI, a comparison of the disadvantaged non-Head Start group and the advantaged with kindergarten group on Paragraph Meaning is reported. The mean for the disadvantaged non-Head Start group was 1.5617, and the standard deviation was .3291. The mean for the advantaged with kindergarten group was 2.2727, with a standard deviation

TABLE XI

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER TWO, PARAGRAPH MEANING

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5617	.3291		
3	77	2.2727	.7589	-6.7075	SD

of .3291. The Fisher's t was -6.7075. This difference between the two groups was significant at the .05 level.

Table XII shows a comparison of the disadvantaged non-Head Start and the advantaged with kindergarten groups on Paragraph Meaning. The mean for the disadvantaged non-Head Start group was 1.5617, and the standard deviation was .3291. The mean for the

TABLE XII

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER TWO, PARAGRAPH MEANING

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5617	.3291		
3	77	2.2727	.7589	-6.7075	SD

disadvantaged non-Head Start group was 1.5617, and the standard deviation was .3291. The mean for the advantaged with kindergarten group was 2.2727, and the standard deviation was .7589. Fisher's t was -6.7075. The level of significance was better than the .05 level in favor of the latter group.

In Table XIII a comparison is made between the disadvantaged non-Head Start and the advantaged without kindergarten groups on Paragraph Meaning. The mean for the disadvantaged non-Head Start group was 1.5617, with a standard deviation of .3291. The mean for the advantaged without kindergarten group was 2.1141, and the standard

deviation was .5427. Fisher's t was -5.2238. The level of significant difference was better than the .05 level in favor of the latter group.

TABLE XIII

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER TWO, PARAGRAPH MEANING

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5617	.3291		
4	78	2.1141	.5427	-5.2238	SD

A comparison is made between the advantaged with kindergarten group and the advantaged without kindergarten group on Paragraph Meaning, shown in Table XIV. The mean for the advantaged with kindergarten group was 2.2727, with a standard deviation of .7589. The mean for the advantaged without kindergarten group was 2.1141, with a standard deviation of .5427. Fisher's t was 1.7242. This difference was not significant at the .05 level. The mean was slightly higher in favor of the advantaged with kindergarten group.

TABLE XIV

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP
AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON
SUBTEST NUMBER TWO, PARAGRAPH MEANING

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.2727	.7589	1.7242	NSD
4	78	2.1141	.5427		

Summary

An analysis of variance has been made on the Stanford Achievement Test, Primary I Battery, on Subtest Number Two, Paragraph Meaning, for four groups of first grade children. Since significant differences were found between two or more groups, it was necessary to use the Fisher's t to determine the differences in the six comparisons of the four groups of children.

In each instance, where comparisons of scores on Paragraph Meaning were made between the disadvantaged groups, with and without Head Start, and the advantaged groups, with and without kindergarten, statistically significant differences were found in favor of the advantaged groups.

Where comparison of scores on Paragraph Meaning were made between two advantaged groups, with and without kindergarten, no

statistically significant differences were found. The mean was slightly higher for the advantaged with kindergarten group. Similarly, where comparisons of scores on Paragraph meaning were made between the two disadvantaged groups, with and without Head Start, no significant differences were found between the two groups. The mean was slightly higher in favor of the disadvantaged Head Start group.

Vocabulary

An analysis of variance is given below for Subtest Number Three, Vocabulary.

An analysis of variance in Table XV was made on comparisons of the Subtest, Vocabulary, from the Stanford Achievement Test on four groups of first grade children. The result shows that there was a

TABLE XV

AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON SUBTEST NUMBER THREE, VOCABULARY

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F	Levels of Significance
Between	61.4823	3	20.4941	32.1948	SD
Within	164.8702	259	.6365		
Total	226.3525	262			

significant difference at the .05 level in one or more of the six comparisons between the four groups. Since a significant difference was indicated, it was necessary to use the Fisher's t to determine which of the six comparisons were significantly different.

When the disadvantaged Head Start and the advantaged without kindergarten groups were compared in Table XVI, a significant difference was found in favor of the latter group. The mean for the

TABLE XVI

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER THREE, VOCABULARY

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.8965	.6493	-5.6504	SD
4	78	2.6782	.8262		

disadvantaged Head Start group was 1.8965, with a standard deviation of .6493. The mean for the advantaged without kindergarten group was 2.6782, with a standard deviation of .8262. Fisher's t was -5.6504. This difference was significant at better than the .05 level.

In Table XVII a comparison is made between the disadvantaged Head Start group and the advantaged with kindergarten group on

TABLE XVII

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER THREE, VOCABULARY

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	50	1.8965	.6493	6.5503	SD
3	77	2.8051	.9828		

Vocabulary. A significant difference was found between the two groups in favor of the latter group. The mean for the disadvantaged Head Start group was 1.8965, and the standard deviation was .6493. The mean for the advantaged with kindergarten group was 2.8051, with a standard deviation of .9828. Fisher's t was 6.5503. This difference was significant at better than the .05 level.

In Table XVIII, a comparison is made between the disadvantaged Head Start and the disadvantaged non-Head Start groups on Vocabulary. The mean for the disadvantaged Head Start group was 1.8965, with a standard deviation of .6493. The mean for the disadvantaged non-Head Start group was 1.6400, and the standard deviation was .5055. Fisher's t was 1.6662. The above differences were not significant at the .05 level. The mean was slightly higher in favor of the disadvantaged Head Start group.

TABLE XVIII

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE DISADVANTAGED NON-HEAD START GROUP ON
SUBTEST NUMBER THREE, VOCABULARY

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
1	58	1.8965	.6493	1.6662	NSD
2	50	1.6400	.5055		

Table XIX shows a comparison of the disadvantaged non-Head Start and the advantaged with kindergarten groups on Vocabulary. The mean for the disadvantaged non-Head Start group was 1.6400, with a standard deviation of .5055. The mean for the advantaged with kindergarten group was 2.8051, with a standard deviation of .9828.

TABLE XIX

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP
AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON
SUBTEST NUMBER THREE, VOCABULARY

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
2	50	1.6400	.5055	-8.0409	SD
3	77	2.8051	.9828		

Fisher's t was -8.0409 . This difference was significant at better than the $.05$ level in favor of the latter group.

In Table XX, a comparison is made between the disadvantaged non-Head Start and the advantaged without kindergarten groups on Vocabulary. The mean for the disadvantaged non-Head Start group

TABLE XX

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER THREE, VOCABULARY

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.6400	.5055	7.1827	SD
4	78	2.6782	.8262		

was 1.6400, and the standard deviation was .5055. The mean for the advantaged without kindergarten group was 2.6782, with a standard deviation of .8262. Fisher's t was 7.1827. This difference was significant at better than the $.05$ level in favor of the latter group.

A comparison is made between the advantaged with kindergarten group and the advantaged without kindergarten group on Vocabulary, in Table XXI. The mean for the advantaged with kindergarten group was 2.8051, with a standard deviation of .9828. The mean for the

TABLE XXI

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER THREE, VOCABULARY

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.8051	.9828	.9907	NSD
4	78	2.6782	.8262		

advantaged without kindergarten group was 2.6782, with a standard deviation of .8262. Fisher's t was .9907. The above groups were not significantly different at the .05 level. However, the mean was slightly in favor of the advantaged with kindergarten group.

Summary

An analysis of variance has been made on the Stanford Achievement Test, Primary I Battery of Subtest Number Three, Vocabulary, for four groups of first grade children. Significant differences were found between two or more groups. Hence, it was necessary to use the Fisher's t to determine the differences in the six comparisons of the four groups of children.

In each instance where comparisons of scores on vocabulary were made between disadvantaged with and without Head Start groups and

advantaged with and without kindergarten groups, statistically significant differences were found in favor of the advantaged groups.

Where comparisons of scores on vocabulary were made between the two advantaged with and without kindergarten groups, no significant differences were found between them. The mean was slightly higher, favoring the advantaged with kindergarten group. Similarly, where comparisons of scores on Vocabulary were made between the two disadvantaged with and without Head Start groups, no significant differences were found between them. However, the mean was slightly higher in favor of the disadvantaged Head Start group.

Spelling

An analysis of variance is given below for Subtest Number Four, Spelling.

TABLE XXII

AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON SUBTEST NUMBER FOUR, SPELLING

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F	Levels of Significance
Between	24.9808	3	8.3269	25.1910	SD
Within	82.9683	251	.3305		
Total	107.9491	254			

From the Stanford Achievement Test results of four groups of first grade children, an analysis of variance (Table XXII) was made on comparisons of the subtest, Spelling. The result showed significant differences at the .05 level in one or more of the six comparisons. Since a significant difference was indicated, Fisher's t was used to determine which of the six comparisons were significantly different.

The following six tables present the data which indicate, according to Fisher's t, whether significant differences were present in each of the six comparisons between the four groups.

When disadvantaged Head Start and the advantaged without kindergarten groups were compared (See Table XXIII), a significant difference was found in favor of the latter group. The mean for the disadvantaged Head Start group was 1.7418, with a standard deviation of .5748, for the advantaged without kindergarten group a mean of 2.2868, with a standard

TABLE XXIII

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP
ON SUBTEST NUMBER FOUR, SPELLING

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.7418	.5748	-5.3548	SD
3	77	2.2868	.5731		

deviation of .5772. Fisher's t was 5.2479, a difference significant at better than the .05 level.

In Table XXIV, a comparison of disadvantaged Head Start and the advantaged with kindergarten groups on Spelling shows a significant difference in favor of the latter group. The mean for the disadvantaged Head Start group was 1.7418, with a standard deviation of .5748, for the advantaged with kindergarten group 2.2868, with a standard deviation of .5731. Fisher's t was -5.3548, a difference significant at better than the .05 level.

TABLE XXIV

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER FOUR, SPELLING

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.7418	.5748		
3	77	2.2868	.5731	-5.3548	SD

When disadvantaged Head Start and disadvantaged non-Head Start groups were compared (Table XXV) in Spelling, a difference was found which was not statistically significant. The mean for the disadvantaged Head Start group was 1.7418, with a standard deviation of .5748, for the disadvantaged non-Head Start group 1.5456, with a standard deviation of .5483. Fisher's t was 1.7076.

TABLE XXV

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE DISADVANTAGED NON-HEAD START GROUP ON
SUBTEST NUMBER FOUR, SPELLING

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.7418	.5748		
2	50	1.5456	.5483	1.7076	NSD

Table XXVI shows a comparison of the disadvantaged non-Head Start and the advantaged with kindergarten groups on Spelling. The mean for the disadvantaged non-Head Start group was 1.5456, with a standard deviation of .5483, for the advantaged with kindergarten group a mean of 2.2868, with a standard deviation of .5731. Fisher's t was

TABLE XXVI

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP
AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON
SUBTEST NUMBER FOUR, SPELLING

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5456	.5483		
3	77	2.2868	.5731	-6.9010	SD

-6.9010, a difference significant at better than the .05 level in favor of the advantaged with kindergarten group.

In Table XXVII, a comparison is made between non-Head Start and the advantaged without kindergarten groups on Spelling. The mean for the disadvantaged non-Head Start group was 1.5456, with a standard

TABLE XXVII

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER FOUR, SPELLING

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5456	.5483		
4	78	2.2730	.5772	-6.8058	SD

deviation of .5483. The mean for the advantaged without kindergarten group was 2.2730, with a standard deviation of .5772. Fisher's t was reported at -6.8058. The groups were significantly different at better than the .05 level. The difference was in favor of the advantaged with kindergarten group.

A comparison is made of the advantaged with kindergarten group and advantaged without kindergarten group on Spelling (See Table XXVIII). The mean for the advantaged with kindergarten group was 2.2868, with

TABLE XXVIII

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER FOUR, SPELLING

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.2868	.5731	.1482	NSD
4	78	2.2730	.5772		

a standard deviation of .5731. The mean for the advantaged without kindergarten group was 2.2730, with a standard deviation of .5772. Fisher's t was .1485. The difference between the two groups above was not significant at the .05 level. The mean was slightly higher in favor of the advantaged with kindergarten group.

Summary

An analysis of variance was made on the Stanford Achievement Test, Primary I Battery, on Subtest Number Four, Spelling, for four groups of first grade children. Since significant differences were found between two or more groups, it was necessary to use the Fisher's t to determine the six comparisons of the four groups of children.

In each instance, where comparisons of scores on Spelling were made between the disadvantaged, with and without Head Start, groups and the advantaged, with and without kindergarten, groups. statistically significant differences were found in favor of the advantaged groups.

Where comparisons of scores on Spelling were made between the two advantaged with and without kindergarten groups, no statistically significant differences were found. The mean was only slightly higher for the advantaged with kindergarten group. Similarly, where comparisons of scores on Spelling were made on the two disadvantaged, with and without Head Start, groups, no significant differences were found between them. The mean was slightly higher in favor of the disadvantaged Head Start group.

Word Study Skills

An analysis of variance is given below for Subtest Number Five, Word Study Skills.

An analysis of variance (Table XXIX) was made on comparisons of the Subtest, Word Study Skills, from the Stanford Achievement Test

TABLE XXIX

AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F	Levels of Significance
Between	93.1471	3	31.0490	36.0935	SD
Within	221.0812	257	.8602		
Total	314.2283	260			

on four groups of first grade children. The result showed that there was a difference at better than the .05 level in one or more of the six comparisons between the four groups. Since a significant difference was indicated, it was necessary to use the Fisher's t between the groups to determine which of the six comparisons were significantly different.

The following six tables present the data which indicate, according to Fisher's t , whether significant differences were present in each of the six comparisons between the four groups.

When the disadvantaged Head Start and the advantaged without kindergarten groups were compared, a significant difference was found between the two groups (Table XXX), in favor of the advantaged without kindergarten group. The mean for the disadvantaged Head Start group was 1.5568, with a standard deviation of .5720. The mean

TABLE XXX

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUPS
ON SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.5568	.5720		
4	78	2.8896	1.1611	-8.2645	SD

for the advantaged without kindergarten group was 2.8896 with a standard deviation of 1.1611. Fisher's t was 8.2645. This difference was significant at better than the .05 level in Word Study Skills.

In Table XXXI, a comparison of the disadvantaged Head Start and the advantaged with kindergarten groups in Word Study Skills showed a significant difference in favor of the advantaged with kindergarten group. The mean for the disadvantaged Head Start group was 1.5568 and the standard deviation was 1.0942. The mean for the advantaged

TABLE XXXI

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.5568	.5720		
3	77	2.5181	1.0942	-5.9612	SD

with kindergarten group was 2.5181, with a standard deviation of 1.0942. Fisher's t was -5.9612. The difference between the two groups was significant at better than the .05 level.

When disadvantaged Head Start and disadvantaged non-Head Start groups were compared (Table XXXII) in Word Study Skills, a difference

TABLE XXXII

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE DISADVANTAGED NON-HEAD START GROUP ON
SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.5568	.5720	.3841	NSD
2	50	1.4877	.3526		

was found which was not statistically significant. The mean for the disadvantaged Head Start group was 1.5568 and the standard deviation was .5720. The mean for the disadvantaged non-Head Start group was 1.4877, with a standard deviation of .3526. Fisher's t was .3841. This difference was not significant at the .05 level of significance. The mean was only slightly higher for the disadvantaged Head Start group.

Table XXXIII shows a comparison of the disadvantaged non-Head Start group and the advantaged with kindergarten group in Word Study Skills. The mean for the disadvantaged non-Head Start group was 1.4877, and the standard deviation was .3526. The mean for the advantaged with kindergarten group was 2.5181, with a standard deviation of 1.0942. Fisher's t was -6.0794. The difference between the groups

TABLE XXXIII

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
2	50	1.4877	.3526	-6.0794	SD
3	77	2.5181	1.0942		

was significant at better than the .05 level in favor of the advantaged with kindergarten group.

A comparison is made between the disadvantaged non-Head Start and the advantaged without kindergarten groups in Word Study Skills (Table XXXIV). The mean for the non-Head Start, disadvantaged

TABLE XXXIV

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Group	Number	Mean	Standard Deviation	<u>t</u>	Level of Significance
2	50	1.4877	.3526	-8.2708	SD
4	78	2.8896	1.1611		

group was 1.4877, with a standard deviation of .3526. The mean for the advantaged without kindergarten group was 2.8896, with a standard deviation of 1.1611. Fisher's t was -8.2708. The difference between the two groups in Word Study Skills was significant at better than the .05 level in favor of the advantaged without kindergarten group.

In Table XXXV, a comparison is made between the advantaged with kindergarten group and the advantaged without kindergarten group in Word Study Skills. The mean for the advantaged with kindergarten group was 2.5181, with a standard deviation of 1.0942. The mean for the

TABLE XXXV

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER FIVE, WORD STUDY SKILLS

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.5181	1.0942		
4	78	2.8896	1.1611	-2.4848	SD

advantaged without kindergarten group was 2.8896, with a standard deviation of 1.1611. Fisher's t was -2.4848. The difference between the two groups was significant at better than the .05 level in Word Study Skills in favor of the advantaged without kindergarten group.

Summary

An analysis of variance was made on the Stanford Achievement Test, Primary I Battery, on Subtest Number Five, Word Study Skills, for four groups of first grade children. Since significant differences were found between two or more groups, it was necessary to use the Fisher's t to determine the differences in the six comparisons of the four groups of children.

In each instance, where comparisons of scores on Word Study Skills were made between the disadvantaged, with and without Head Start, groups and the advantaged, with and without kindergarten, groups, statistically significant differences were found in favor of the advantaged groups.

Where comparisons of scores on Word Study Skills were made between the two advantaged with and without kindergarten groups, statistically significant differences were found in favor of the advantaged without kindergarten group. Where comparisons of scores on Word Study Skills were made between the two disadvantaged, with and without Head Start, groups, no significant differences were found between them. The mean for the disadvantaged Head Start group was slightly higher.

Arithmetic

An analysis of variance is given below for Subtest Number Six, Arithmetic.

TABLE XXXVI

AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON SUBTEST NUMBER SIX, ARITHMETIC

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F	Levels of Significance
Between	38.5898	3	12.8632	45.4155	SD
Within	72.5081	256	.2832		
Total	111.0979	259			

An analysis of variance (Table XXXVI) was made on comparisons of the Subtest, Arithmetic, from the Stanford Achievement Test on four groups of first grade children. The result showed that there was a significant difference at better than the .05 level in one or more of the six comparisons between the four groups of children. Since a significant difference was indicated, it was necessary to use the Fisher's t between the groups to determine which of the six comparisons were significantly different.

The following six tables present the data which indicate, according to Fisher's t, whether significant differences were present in each of the six comparisons between the four groups.

When disadvantaged Head Start and the advantaged without kindergarten groups were compared (Table XXXVII), a significant difference was found between the two groups in favor of the latter group. The mean

TABLE XXXVII

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER SIX, ARITHMETIC

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.63333	.3926	-8.2532	SD
4	78	2.3987	.5348		

for the disadvantaged Head Start group was 1.6333, with a standard deviation of .3926. The mean for the advantaged without kindergarten group was 2.3987, with a standard deviation of .5348. Fisher's t was -8.2532. This difference was significant at better than the .05 level.

In Table XXXVIII, a comparison of disadvantaged Head Start and advantaged with kindergarten groups on Arithmetic showed a significant difference in favor of the latter group. The mean for the disadvantaged Head Start group was 1.63333, with a standard deviation of .3926. The mean for the advantaged with kindergarten group was 2.4532,

TABLE XXXVIII

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON
SUBTEST NUMBER SIX, ARITHMETIC

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.6333	.3926	-8.8170	SD
3	77	2.4532	.6523		

with a standard deviation of .6523. Fisher's t was -8.8170. The difference was significant at better than the .05 level.

Table XXXIX shows a comparison of the disadvantaged Head Start and the disadvantaged non-Head Start groups on Arithmetic. The mean for the disadvantaged Head Start group was 1.6333, with a standard deviation of .3926. The mean for the disadvantaged non-Head Start

TABLE XXXIX

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE DISADVANTAGED NON-HEAD START GROUP ON
SUBTEST NUMBER SIX, ARITHMETIC

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.6333	.3926	-.1798	NSD
2	50	1.6520	.4242		

group was 1.6520, with a standard deviation of .4242. Fisher's t was -.1798. This difference was not significant at the .05 level. However, the mean was slightly higher for the disadvantaged non-Head Start group.

Table XL shows a comparison of the disadvantaged non-Head Start and the advantaged with kindergarten groups on Arithmetic. The mean

TABLE XL

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON SUBTEST NUMBER SIX, ARITHMETIC

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.6520	.4242		
3	77	2.4532	.6523	8.1857	SD

for the disadvantaged non-Head Start group was 1.6520, with a standard deviation of .4242. The mean for the advantaged with kindergarten group was 2.4532, with a standard deviation of .6523. Fisher's t was 8.1857. The level of significant difference was better than the .05 level in favor of the advantaged with kindergarten group.

For Table XLI, a comparison was made between the disadvantaged non-Head Start and the advantaged without kindergarten groups on

TABLE XLI

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP
AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP
ON SUBTEST NUMBER SIX, ARITHMETIC

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.6520	.4242		
4	78	2.3987	.5348	-7.6474	SD

Arithmetic. The mean for the disadvantaged non-Head Start group was 1.6520, with a standard deviation of .4242. The mean for the advantaged without kindergarten group was 2.3987, with a standard deviation of .5348. Fisher's t was -7.6474. The groups were significantly different at better than the .05 level on Arithmetic in favor of the advantaged with kindergarten group.

A comparison was made of the advantaged with kindergarten group and the advantaged without kindergarten group (Table XLII). The mean for the advantaged with kindergarten group was 2.4532, with a standard deviation of .6523. The mean for the advantaged without kindergarten group was 2.3987, with a standard deviation of .5348. Fisher's t was reported at .6377. This difference was not

TABLE XLII

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON SUBTEST NUMBER SIX, ARITHMETIC

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.4532	.6523	.6377	NSD
4	78	2.3987	.5348		

significant at the .05 level between the two groups. The mean was slightly higher in favor of the advantaged with kindergarten group.

Summary

An analysis of variance was made on the Stanford Achievement Test, Primary I Battery, on Subtest Number Six, Arithmetic, for four groups of first grade children. Since significant differences were found between two or more groups, it was necessary to use the Fisher's t to determine the differences in the six comparisons of the four groups of children.

In every instance, where comparisons of scores on Arithmetic were made between the disadvantaged, with and without Head Start, groups and the advantaged, with and without kindergarten, groups, statistically significant differences were found in favor of the advantaged groups.

No statistically significant differences were found where comparisons of scores on Arithmetic were made between the two advantaged groups, with and without kindergarten. The mean was slightly higher for the advantaged with kindergarten group. Also, where comparisons of scores on Arithmetic were made between the two disadvantaged, with and without Head Start, groups, no significant differences were found between the two groups. The mean was slightly higher in favor of the disadvantaged non-Head Start group.

Total Test Average

An analysis of variance is given below for Total Test Average.

TABLE XLIII

AN ANALYSIS OF VARIANCE BETWEEN GROUPS ON TOTAL TEST AVERAGE

Source	Sum Squares	Degrees of Freedom	Variance Estimate	F	Levels of Significance
Between	36.2308	3	12.0769	45.0592	SD
Within	69.4181	259	.2680		
Total	105.6489	262			

An analysis of variance in Table XLIII was made on comparisons of Total Test Average from the Stanford Achievement Test on four groups of first grade children. The result showed a significant

difference above the .05 level in one or more of the six comparisons between the four groups. Since a significant difference was indicated, it was necessary to use the Fisher's t to determine which of the six comparisons were significantly different.

The following six tables present the data which indicate, according to Fisher's t, whether significant differences were present in each of the six comparisons between the four groups.

It was predicted in Hypothesis One that there would be no significant difference in the academic achievement in basic school subjects between the disadvantaged Head Start group and the advantaged without kindergarten group. The mean for the disadvantaged Head Start group on Total Test Average (Table XLIV) was 1.6913, with a standard deviation of .4438. The mean for the advantaged without kindergarten

TABLE XLIV

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP
AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP
ON TOTAL TEST AVERAGE

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.6913	.4438		
4	78	2.3641	.5151	-7.4944	SD

group was 2.3641, with a standard deviation of .5151. Fisher's t was -7.4944. This difference was significant at better than the .05 level in favor of the latter group. Hypothesis One was therefore rejected.

It was predicted in Hypothesis Two that there would be no significant difference in the academic achievement in basic school subjects between the disadvantaged Head Start group and the advantaged with kindergarten group. The mean for the disadvantaged Head Start group on Total Test Average (Table XLV) was 1.6913, with a standard deviation

TABLE XLV

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON TOTAL TEST AVERAGE

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.6913	.4438		
3	77	2.3831	.6402	-7.6850	SD

of .4438. The mean for the advantaged with kindergarten group was 2.3831, with a standard deviation of .6402. Fisher's t was -7.6850. This difference was significant at better than the .05 level in favor of the latter group. Hypothesis Two was therefore rejected.

It was predicted in Hypothesis Three that there would be no significant difference in academic achievement in basic school subjects between the disadvantaged Head Start group and the disadvantaged non-Head Start group. The mean for the disadvantaged Head Start group on Total Test Average (Table XLVI) was 1.6913, with a standard deviation of .4438. The mean for the non-Head Start disadvantaged

TABLE XLVI

A COMPARISON OF THE DISADVANTAGED HEAD START GROUP AND THE DISADVANTAGED NON-HEAD START GROUP ON TOTAL TEST AVERAGE

Group	Number	Mean	Standard Deviation	t	Level of Significance
1	58	1.6913	.4438	1.4351	NSD
2	50	1.5480	.3383		

group was 1.5480, with a standard deviation of .3383. Fisher's t was 1.4351. The mean for disadvantaged Head Start group was slightly higher. This difference was not statistically significant at the .05 level. Hypothesis Three was therefore accepted.

It was predicted in Hypothesis Four that there would be no significant difference in the academic achievement in basic school subjects between the disadvantaged non-Head Start group and the advantaged with

kindergarten. The mean for the disadvantaged non-Head Start group on Total Test Average (Table XLVII) was 1.5480, with a standard

TABLE XLVII

A COMPARISON OF THE DISADVANTAGED NON-HEAD START GROUP AND THE ADVANTAGED WITH KINDERGARTEN GROUP ON TOTAL TEST AVERAGE

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5480	.3383		
3	77	2.3831	.6402	-8.8815	SD

deviation of .3383. The mean for the advantaged with kindergarten group was 2.3831, with a standard deviation of .6402. Fisher's t was -8.8815. This difference was significant at better than the .05 level of significance in favor of the latter group. Hypothesis Four was therefore rejected.

It was predicted in Hypothesis Five that there would be no significant difference in the academic achievement in basic school subjects between the disadvantaged non-Head Start group and the advantaged without kindergarten group on Total Test Average (Table XLVIII). The mean for the disadvantaged non-Head Start group was 1.5480, with a standard deviation of .3383. The mean for the advantaged

TABLE XLVIII

A COMPARISON OF THE DISADVANTAGED NON-HEADSTART GROUP
AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON
TOTAL TEST AVERAGE

Group	Number	Mean	Standard Deviation	t	Level of Significance
2	50	1.5480	.3383		
4	78	2.3641	.5151	-8.7013	SD

without kindergarten group was 2.3641, with a standard deviation of .5151. Fisher's t was -8.7013. This difference was significant at better than the .05 level in favor of the latter group. Hypothesis Five was therefore rejected.

It was predicted in Hypothesis Six that there would be no significant difference in the academic achievement in basic school subjects between the advantaged with kindergarten group and the advantaged without kindergarten group. The mean for the advantaged with kindergarten group on Total Test Average (Table XLIX) was 2.3831, with a standard deviation of .6402. The mean for the advantaged without kindergarten group was 2.3641, with a standard deviation of .5151. Fisher's t was .2286. The differences between the two groups were not statistically significant except in Subtest Five (See Table XXXV).

TABLE XLIX

A COMPARISON OF THE ADVANTAGED WITH KINDERGARTEN GROUP AND THE ADVANTAGED WITHOUT KINDERGARTEN GROUP ON TOTAL TEST AVERAGE

Group	Number	Mean	Standard Deviation	t	Level of Significance
3	77	2.3831	.6402	.2286	NSD
4	78	2.3641	.5151		

Hypothesis Six was therefore accepted, with the exception of Subtest Five, Word Study Skills.

Summary of Findings

An analysis of variance has been made on the Stanford Achievement Test, Primary I Battery, of the Total Test Average for four groups of first grade children. Significant differences were found between one or more groups. Hence, it was necessary to use the Fisher's t test to determine the location of the differences in the six comparisons of the four groups of children.

The results of testing the hypotheses considered in this study can be summarized briefly in the following manner:

1. The disadvantaged Head Start group and the advantaged without kindergarten group showed differences that were statistically

significant, when compared on academic achievement of basic school subjects. These differences were in favor of the advantaged without kindergarten group. Therefore, Hypothesis One as stated for this comparison was rejected.

2. When compared on academic achievement of basic school subjects, the disadvantaged Head Start group and the advantaged with kindergarten group were shown to have differences that were statistically significant. These differences were in favor of the advantaged with kindergarten group. Hypothesis Two as stated for this comparison was rejected.

3. There was not a statistically significant difference between the disadvantaged Head Start group and the disadvantaged non-Head Start group, when compared on academic achievement of basic school subjects. The mean scores were slightly higher for the disadvantaged Head Start group, with one exception. The mean was slightly higher for the disadvantaged non-Head Start group in Arithmetic. Hypothesis Three was therefore accepted for this group comparison.

4. When compared on academic achievement of basic school subjects, there was a statistically significant difference between the disadvantaged non-Head Start group and the advantaged with kindergarten group. This difference was in favor of the advantaged with

with kindergarten group. Hypothesis Four as stated for this comparison was rejected.

5. There was a statistically significant difference between the disadvantaged non-Head Start group and the advantaged without kindergarten group on academic achievement of basic school subjects. This difference was in favor of the advantaged without kindergarten group. Hypothesis Five was therefore rejected for the group comparison.

6. The two groups, advantaged with kindergarten, and advantaged without kindergarten, were not significantly different on comparisons of academic achievement in basic school subjects, except in one instance. Subtest Six, Word Study Skills, showed a difference that was statistically significant in favor of the advantaged without kindergarten group. Hypothesis Six was therefore accepted, except on Subtest Six, Word Study Skills.

CHAPTER BIBLIOGRAPHY

1. Kelley, Truman L., The Stanford Achievement Test, Primary I, New York, Harcourt, Brace and World, Inc., 1964.
2. McNemar, Quinn, Psychological Statistics, New York, John Wiley & Sons, Inc., 1962.

CHAPTER V

DISCUSSION, SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the difference in academic achievement between pupils who attended a 1966 eight-weeks summer Head Start enrichment program when compared with three non-Head Start groups. Academic achievement was measured by the Stanford Achievement Test, a test given in May, 1967, near the end of the first grade. For each of the above four groups, family income and pre-school experiences (or lack of them) were used as criteria for selection of the groups.

Subjects included in this study were 263 first grade pupils from a small city in the southwestern part of the United States. There were 141 boys and 122 girls in the study population. The racial composition was Caucasian, 188; Negro, 65; and Latin American, 10. The Head Start, disadvantaged, pupils were 58 in number. For the non-Head Start, disadvantaged, subjects, there was a total of 50; for the non-Head Start, advantaged with kindergarten, a total of 77 pupils. The non-Head Start, advantaged without kindergarten, group contained a

total of 78 pupils. Eight elementary schools were used. There was one predominantly Negro school, four integrated schools, and three schools with Caucasian pupils only.

The groups were chosen for participation in the study by data collected from the response to a letter sent to the parents of each child within the first grade classroom selected. The letter contained a short introduction to the parents, relative to the study. The pupils were assigned to a group according to family income and the extent of their pre-school experiences or lack of them. All subjects received the Stanford Achievement Test, Primary I Battery. The test was administered during the first week in May. The Stanford Achievement Test is a measurement of academic achievement in the basic school subjects. The test includes measurement in Word Reading, Paragraph Meaning, Vocabulary, Spelling, Word Study Skills, and Arithmetic. A total test average was determined for the six tests.

The data were programmed using the IBM computer in the North Texas State University Computer Center. The statistical technique used to treat the data was the simple analysis of variance between the groups. Fisher's t was used to determine where significant differences occurred within the groups compared.

Statistical steps involved in testing the hypotheses required computing the separate means, the standard deviation, and the testing

of the significance between the means of compared groups by use of the Fisher's t test.

The following hypotheses were formulated and investigated by statistical analysis of test results:

1. There will be no significant difference in the academic achievement in basic school subjects between disadvantaged pupils having Head Start and the advantaged pupils having no kindergarten experiences. Significant differences were found between the two groups in favor of the advantaged children without kindergarten. The differences on each subtest of the academic achievement test reached better than the .05 level. Hypothesis one was therefore rejected.

2. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having Head Start and the advantaged pupils having kindergarten. The data showed differences that were statistically significant in favor of the advantaged children with kindergarten. For each subtest of the test, the difference between the two groups on academic achievement was above the .05 level of significance. Hypothesis two was rejected.

3. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils

having Head Start and the disadvantaged pupils having neither Head Start nor kindergarten. No significant differences were found between the two groups of children in academic achievement. The mean differences were slightly higher in favor of the Head Start pupils on all subtests except Arithmetic. This difference, though not statistically significant, was in favor of the non-Head Start group having neither kindergarten nor Head Start. Hypothesis three was accepted.

4. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having neither Head Start nor kindergarten and the advantaged pupils having kindergarten. For every subtest of the achievement test, significant differences were found between the two groups. The differences were all above the .05 level of significance and in favor of the advantaged pupils with kindergarten.

5. There will be no significant difference in the academic achievement in basic school subjects between the disadvantaged pupils having neither Head Start nor kindergarten and the advantaged pupils having no kindergarten. The data showed differences that were statistically significant at better than the .05 level of significance in academic achievement in favor of the advantaged group having kindergarten. There were no instances in which the disadvantaged pupils

reached a level that was as high as the advantaged with kindergarten group. Hypothesis five was rejected.

6. There will be no significant difference in the academic achievement in basic school subjects between the advantaged pupils having kindergarten and the advantaged pupils having no kindergarten. No significant differences were found between the two groups of children in academic achievement except in Word Study Skills. This difference was statistically significant in favor of the advantaged pupils having no kindergarten. The significant difference was better than the .05 level. Hypothesis six was therefore accepted, except on subtest five, Word Study Skills.

Conclusions

The following conclusions are based on findings from this study:

1. With respect to academic achievement at the end of first grade, disadvantaged pupils show a handicap that is statistically significant when compared with advantaged pupils having no kindergarten experience.

2. At the end of the first grade, there is a statistically significant difference in academic achievement between disadvantaged pupils having Head Start and advantaged pupils having kindergarten

experience. This difference is in favor of the advantaged pupils having kindergarten.

3. With respect to academic achievement at the end of their first year in school, there is no statistically significant difference between disadvantaged pupils having Head Start and disadvantaged pupils having neither Head Start nor kindergarten.

4. When compared with advantaged pupils having kindergarten, disadvantaged pupils having neither kindergarten nor Head Start are under a handicap that is statistically significant with respect to academic achievement at the end of first grade.

5. With respect to academic achievement at the end of first grade, there is a statistically significant difference between disadvantaged pupils having neither Head Start nor kindergarten and advantaged pupils having no kindergarten. The difference is in favor of advantaged pupils having no kindergarten experiences.

6. With respect to academic achievement at the end of first grade, the differences between advantaged pupils having kindergarten and advantaged pupils having no kindergarten were not statistically significant except on Word Study Skills. There were statistically significant differences between the above groups on Word Study Skills in favor of the advantaged pupils having no kindergarten.

Discussion

This study was a comparison of four groups of first grade children on academic achievement. There were two groups of disadvantaged pupils with and without Head Start and two groups of advantaged pupils with and without kindergarten. When each group was compared with every other group, there was a total of six comparisons. Statistically significant differences were found to exist between the Head Start group and the advantaged group having no kindergarten. These differences were in favor of the advantaged pupils having no kindergarten. The above results are partly supported by Brunner (1), who attempted to evaluate the experiences gained in a pre-school enrichment program and found that continued attention was needed to help the child. This study would indicate that pre-school enrichment programs are beginning steps and must be considered as initial and temporary aids.

When Head Start, disadvantaged, pupils and advantaged pupils having kindergarten were compared, there were statistically significant differences on all variables of an academic achievement test. The differences were in favor of the advantaged with kindergarten group. The advantage of having been in a Head Start program did not make a difference when the two groups were compared. It appeared that

the gap between the two groups was too wide to overcome in a six-weeks pre-school enrichment program.

The Head Start group was superior to the disadvantaged group having neither Head Start nor kindergarten, but the differences were not statistically significant on five subtests and on total academic achievement. In Arithmetic, although not statistically significant, the mean of the disadvantaged group having neither kindergarten nor Head Start is slightly higher than for the Head Start group. One can only speculate as to the reason for this difference. Further research on Arithmetic achievement between similar groups might help in understanding this difference.

During the collection of data for this study, the observation was made that it appeared somewhat easier to secure forms with approximate income checked when income levels were higher. For the disadvantaged group having neither kindergarten nor Head Start, data was seemingly more difficult to collect. Further, the disadvantaged pupils having neither Head Start nor kindergarten represent the smallest number of subjects in this study. It may be that geographical area has more opportunities for economic advancement. If such is the case, then it would be reasonable to expect that there would be fewer disadvantaged pupils.

A comparison of disadvantaged children having neither kindergarten nor Head Start and advantaged children having kindergarten shows differences that were statistically significant. These differences are in favor of the advantaged having kindergarten group on all variables of a standardized achievement test. This difference can partly be supported by Widmer (6), who has studied the advantages of being in a kindergarten program. Perhaps Sexton's study (5) on the probable reasons for children from lower income homes having trouble in school may be important here, also. She listed the probable reasons as lack of proper care and food, improper housing, and improper medical attention. The community ties in lower income families were also mentioned as being slight. Perhaps some of these same factors operated in the lives of children for this population. It may be possible that these variables were important in both disadvantaged groups.

The results of a comparison of academic achievement between disadvantaged children having neither Head Start nor kindergarten and advantaged children having no kindergarten show a difference that is statistically significant. The difference is in favor of the advantaged having no kindergarten. Criscuolo (2) has pointed to some of the probable reasons for deficiencies in the first grade. It would seem

that some of the deficiencies brought into the first grade by disadvantaged children would be too great to overcome in a single school session.

Differences were found between the advantaged having kindergarten and the advantaged having no kindergarten groups on Word Study Skills. A difference, statistically significant, was found in favor of the advantaged group having no kindergarten. The differences on the other five subtests and the total test average were in favor of the pupils with kindergarten, but they were not statistically significant. More research would be needed to determine the probable reasons for this difference. One would expect that, when compared, two advantaged groups might be more alike than different.

These findings suggest that at least four groups of children may be found in any one unselected classroom. It is vital that ways should be found to work with each group so that the greatest results in academic achievement might be obtained at the first grade level. This seems to be a problem for the classroom teacher. It is clear that time need not be wasted in waiting until another dropout occurs to understand why it has happened. The reason may be that the difference in his environmental experiences is too great, in many cases, to overcome.

Recommendations

1. Better ways of working with disadvantaged children should be found. The wide gap between disadvantaged and advantaged children suggests the need for teaching methods that are creative, stimulating, and challenging to all children.

2. Further research is necessary to determine whether smaller class size in areas where first grade Head Start children are located would help them in their academic achievement. Perhaps smaller class size, where there is great need for it, would allow for more attention to individual differences.

3. Further research is needed to understand why advantaged pupils having no kindergarten would show gains that are significantly greater than advantaged children having kindergarten in the area of Word Study Skills.

4. In-service education programs and conferences are needed to give teachers insight into special problems of the disadvantaged child. Small beginnings now could yield great gains in achievement at a later time.

CHAPTER BIBLIOGRAPHY

1. Brunner, Catherine, "Preschool Experiences for the Disadvantaged," The Educationally Retarded and Disadvantaged, Sixty-sixth Yearbook of the National Society for the Study of Education, Part I, Chicago, 1967.
2. Criscuolo, Nicholas P., "Pre-Reading Activities in the Primary Grades," Arizona Teacher, LVI (November, 1966), 12.
3. Kelley, Truman L., and others, Stanford Achievement Test, Primary I, New York, Harcourt, Brace and World, Inc., 1964.
4. McNemar, Quinn, Psychological Statistics, New York, John Wiley & Sons, Inc., 1962.
5. Sexton, Patricia C., Education and Income, New York, The Viking Press, 1961.
6. Widmer, E. L., "Why Kindergarten?" Peabody Journal of Education, XLIV (January, 1967), 210-215.

APPENDIX

———— PUBLIC SCHOOLS

To: Parents of First Grade Pupils

Selected schools of the ————— Independent School District are planning to participate in a study which should be important in helping us to do a better job with your child. Mrs. Lewis, a graduate student at North Texas State University, is making a study of children's academic achievement from various economic backgrounds. We are assisting her in the study so that the ————— School System will benefit from the information gathered. Please answer the following questions and return to the child's teacher in the envelope. The answers will be kept confidential.

Thank you very much for helping.

Approved: _____
Principal

FILL IN THE BLANKS

Name of Child _____
Age _____ Grade _____ Birthdate _____
Mother's Name _____
Father's Name _____
Home Address _____
Number of Children _____ Telephone _____
Teacher's Name _____

PRESCHOOL EXPERIENCES (Circle One):

Has the child attended Nursery School?	Yes	No
Has the child attended Kindergarten?	Yes	No

APPROXIMATE ANNUAL INCOME (Check One):

Not more than \$1,500 _____
Not more than \$2,000 _____
Not more than \$2,500 _____

Not more than \$3,000	_____
Not more than \$3,500	_____
Not more than \$4,000	_____
Not more than \$4,500	_____
Not more than \$5,000	_____
\$5,000-\$10,500	_____
\$10,500-\$20,000	_____
\$20,000-\$30,000	_____
Above \$30,000	_____

Signed _____
Parent

BIBLIOGRAPHY

Books

- Ahmann, Stanley J., and Marvin D. Glock, Evaluating Pupil Growth, Boston, Allyn and Bacon, Inc., 1963.
- Bruner, Jerome S., The Process of Education, Cambridge, Harvard University Press, 1960.
- McNemar, Quinn, Psychological Statistics, New York, John Wiley & Sons, Inc., 1962.
- Sexton, Patricia C., Education and Income, New York, The Viking Press, 1961.

Articles

- Brazziel, William F., "Two Years of Head Start," Phi Delta Kappan, XLVIII (March, 1967), 344-348.
- Broman, Betty, "Parents Reaction to Head Start," Childhood Education, XLII (April, 1966), 483-486.
- Carton, Aaron S., "Poverty Programs--Civil Rights and the American School," School and Society, XCV (February, 1967), 108-109.
- Cartwright, Walter J., and W. G. Steglich, "Where the Need is Greatest," Texas Outlook, LI (April, 1967), 32-33.
- Criscuolo, Nicholas P., "Pre-Reading Activities in the Primary Grades," Arizona Teacher, LVI (November, 1966), 12.
- Goldsmith, Cornelia, "Our Concerns for Young Children Today," Young Children, XXII (November, 1966), 71-77.
- Havighurst, Robert J., "Conditions Favorable and Detrimental to the Development of Talent," School Review, LXV (Spring, 1957), 20-26.

- Hyman, Irwin A., and Deborah Sill Kliman, "First Grade Readiness of Children Who Have Had Summer Head Start Programs," The Training School Bulletin, LXIII (February, 1967), 163-167.
- John, Vera P., "The Intellectual Development of Slum Children," American Journal of Ortho Psychiatry, XXXIII (October, 1963), 813-822.
- Jones, G. W., "Compensatory Education for the Disadvantaged," NEA Journal, LVI (April, 1967), 21-23.
- Knoll, Erwin, "Head Start Limp Along to Popularity," Southern Education Report, II (July-August, 1966), 8-9.
- Lee, E. S., "Negro Intelligence and Selective Migration, A Philadelphia Test of the Klineberg Hypothesis," American Sociological Review, XVI (February, 1951), 227-233.
- Maggins, Donald L., "Will Success Spoil Head Start?" Education Digest, XXXI (April, 1966), 7-9.
- Orton, Richard E., "We're Past the Trial Run," Instructor, LXXVI (December, 1966), 24-26.
- Osborne, Keith, "Project Head Start--An Assessment," Educational Leadership, XXXIII (November, 1965), 98-101.
- Risenberg, Leon, "Progress Report: Office of Economic Opportunity," Educational Leadership, XXIV (October, 1966), 39-45.
- Robinson, Donald P., "Head Starts in Mississippi," Phi Delta Kappan, XLVII (October, 1965), 84, 116-119.
- Sugarman, Jules, "Head Start or False Start?" Grade Teacher, LXXXIV (December, 1966), 84, 116-119.
- Widmer, E. L., "Why Kindergarten?" Peabody Journal of Education, XLIV (January, 1967), 210-215.
- Wolff, Max, and Annie Stein, "Head Start Six Months Later," Phi Delta Kappan, XLVIII (March, 1967), 349-350.

Wright, W. P., "Poor Given Head Start in Abilene," American School Board Journal, XLII (May, 1966), 14.

Tests

Kelley, Truman L. and others, Stanford Achievement Test, Primary I Battery, New York, Harcourt, Brace and World, Inc., 1964.

_____, Stanford Achievement Test, Primary I Battery: Directions for Administering, New York, Harcourt, Brace and World, Inc., 1964.

Reports

Giles, Douglas E., A Comparison of the Oral Language Development of Head Start Pupils with Non-Head Start Pupils, A Research Report, Washington, D. C., U. S. Department of Health, Education and Welfare, 1966.

Office of Economic Opportunity, "How to Apply for a Head Start Child Development Program," Washington, Community Action Program, 1965.

Publications of Learned Organizations

Brunner, Catherine, "Preschool Experiences for the Disadvantaged," The Educationally Retarded and Disadvantaged, Sixty-sixth Yearbook of the National Society for the Study of Education, Part I (Chicago, 1967).

Unpublished Materials

Gray, Susan W., and R. A. Klaus, "Interim Report: Early Training Project," unpublished report, George Peabody College, Murfreesboro, Tennessee, City Schools, 1963.