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This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of The University of New Mexico in partial fulfillment of the requirements for the degree of

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A COMPARISON OF FIRST GRADE CHILDREN WITH KINDERGARTEN
AND NON-KINDERGARTEN BACKGROUNDS

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A COMPARISON OF FIRST GRADE CHILDREN WITH KINDERGARTEN
AND NON-KINDERGARTEN BACKGROUNDS

BY
ROBERT GREGORY WALSH
B.A., College of Santa Fe, 1972

THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Arts in Special Education
in the Graduate School of
The University of New Mexico
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July, 1973

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ABSTRACT OF THESIS

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A COMPARISON OF FIRST GRADE CHILDREN WITH KINDERGARTEN AND NON-KINDERGARTEN BACKGROUNDS

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The entire first grade of an elementary school in Albuquerque was divided up into two groups; one group consisted of those who had attended kindergarten and the other group was made up of those who had not attended kindergarten. The hypothesis for this study was that kindergarten attendance would affect the academic achievement of first graders in Albuquerque, New Mexico, when tested at the beginning and end of each school year.

The Wide Range Achievement Test (1965 Revised edition) was administered early in first grade and at the end of first grade. The test was designed to measure academic achievement in the areas of spelling, arithmetic, and reading, and yield a grade level score. The results of the data collection and analysis showed that a significant difference existed between the two groups at the first testing in the area of reading and at the time of the second testing, in the area of spelling. No significant difference existed in the first administration of the spelling and arithmetic subtests and in the second administration of the reading and arithmetic subtests.

CHAPTER I

STATEMENT OF PURPOSE

The purpose of this study was to identify differences in academic achievement between a group of first graders who have had some type of kindergarten experiences versus a group which has had no formal pre-school experience.

According to Piaget (1952), "experience is necessary to the development of intelligence [p. 362] ." It is Benjamin Bloom's (1964) opinion that:

“ Since our estimates suggest that about seventeen percent of the growth (in educational achievement) takes place between the ages of four and six, we could hypothesize that nursery school and kindergarten could have far-reaching consequences on the child's general learning pattern. . . . These are the years in which general learning patterns develop most rapidly, and failure to develop appropriate achievement and learning in these years is likely to lead to continued failure throughout the remainder of the individual school career [p. 110]. ”

“ Bergami and Swanson (1954) feel that the real value of kindergarten lies in the opportunities it offers for social adjustment and for preparation for the more formal learning situation of the first grade. Foster (1959) stated that "if a child has had the opportunity to build and if he has been capable of building for himself a broad sense of understanding in the kindergarten, his first grade experience will seem a natural and satisfying extension of earlier experiences [p. 452]. ”



The Education Commission of the States (1971) quotes the U. S. Census Bureau as stating in 1965 that one in ten children in the three to five years old age group was enrolled in some kind of formal education program; in 1970 this figure was one in five. Most parents sending their children to a formal pre-school assume, as do most educators, that this exposure will have a positive effect on the child's later school performance. This assumption is based on many years of research. In the past, studies had indicated that there is a positive relationship between pre-school programs and achievement in kindergarten and first grade. Dickerson (1959), after summarizing 157 separate pieces of research bearing on early childhood education, concluded that early childhood education has a positive influence on later academic achievements; that it provides a wide variety of opportunities for building skills necessary for intelligent behavior, helps to safeguard health, and develops good social attitudes. Wolff and Stein (1966) came to the conclusion that children having Head Start showed greater learning readiness and eagerness to learn than non-Head Start children upon entering kindergarten. Bronfenbrenner (1967) stated that children from deprived homes are at least able to hold their own against classmates from higher socio-economic backgrounds as a result of Head Start. In another study, Chorost (1967) indicated that children who attended Head Start have a significantly higher rate of attendance when they reach the first grade. Victor and Caller (1969) headed a study for the U. S. Office of Education on the effects of pre-school enrichment programs; the results indicated that enrichment programs such as Head Start and kindergarten do produce

significant positive effects in the educational development of inner-city youth of low socio-economic development background. A study conducted by Shaw (1957) concluded that pre-school experiences make an important contribution to the social adjustment of first graders.

One of the classic studies in research literature is that of Skeel's, which showed the long-range effects of early intervention over a period of twenty-two years. The following is Butler's (1970) account of this now famous research. Skeel's experimental group included thirteen children with a mean IQ of sixty-four. The treatment consisted of spending large amounts of time with adults, attending both nursery school and kindergarten, and exposure to other kinds of enrichment programs. The control group consisted of twelve four-year-olds with a mean IQ of eighty-six point seven. Adult follow-up twenty years after the post-experiment provided striking results. Skeel found that the mean grade completed by the experimental group was twelve point eight, while only one subject in the control group had an education beyond the eighth grade. In a related study, Deutsch (1963) compared the intelligence scores of a group of children who attended kindergarten and pre-school with those of a group whose initial contact with school was the first grade. He found significantly higher IQ scores among the experimental group.

Many studies have also been conducted in the area of kindergarten attendance and academic achievement. Morrison concluded that kindergarten instruction reduced first grade failure by 14% and that normal or accelerated promotion through the grades was made by 80% of the group with kindergarten

experience but only 59% of the group without kindergarten experience. Fuller (1961) stated,

Research suggests that kindergarten children surpass non-kindergarten children more in arithmetic reasoning than in the use of basic skills in numbers. They seem to be able to attempt difficult or unfamiliar problems than are non-kindergarten children [p. 9].

Fast (1957) found that kindergarten attendance not only enhanced academic performance, but also that evidence of this gain could be found as late as grade eleven. Fast also found that kindergarteners achieved significantly higher scores on a reading test than did non-kindergarteners in the first grade. In a related study East (1953) compared the achievement of kindergarten and non-kindergarten children in the first grade on the Metropolitan Achievement Test. He found that the average achievement for the kindergarten group was a grade equivalent of 2.11, for the non-kindergarten group, 1.65. Goetch (1926) also found that the mean grade equivalent score in reading was higher for the children who had attended kindergarten when compared with those who had not. The Learning Institute of North Carolina (1973) found that five-year-olds were entering the state kindergartens scoring far below the national average on standardized tests, but at the end of the year they were among the top fourth of the national average on the standardized tests. All of the above studies indicated that there is a positive relationship between kindergarten attendance and academic achievement.

Other studies have found a negative relationship between pre-school attendance and academic achievement. Davies (1957) stated that,

The American Educational Research Association matched two groups of children in the areas of sex, age, home conditions and intelligence. One group began reading at the age of six, the other at the age of seven. In two years the late-beginning group had caught up with the early-beginning group. After the first two years, these two groups were joined in classes. At the end of their seventh school year the children who began a year later were one year ahead of the early beginners [p. 140].

A number of other studies (Carol, 1964) (Stein, 1964) (Hampleman, 1959) have also concluded that later entrants significantly excelled those who started earlier in the area of reading achievement.

Most developmental growth takes place before school age and considerable research had shown that early schooling does positively affect IQ scores. Research has also been cited which shows significant relationships between kindergarten attendance and academic achievement.

In a state such as New Mexico, where there is no state-funded kindergarten system, research is needed on kindergarten attendance and academic achievement. The specific hypothesis of this study is that kindergarten attendance will affect the academic achievement of first graders in Albuquerque, New Mexico, tested both at the beginning and at the end of the school year.

↑ Leads]

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CHAPTER II

METHOD

The subjects used in this study consisted of the entire first grade attending an elementary school in Albuquerque, New Mexico. Children repeating the first grade and those entering or leaving after October 31, 1972, were excluded from the study. The sample consisted of 47 children, 19 boys and 28 girls. The school is located in a predominantly lower middle class neighborhood. The majority of the children in this study were of Anglo-Saxon descent with nine Mexican-Americans and one Black child. The mean chronological age at the time of the first test administration was six years, four months with the range being five years, eleven months, to seven years.

Initial investigation revealed that of the 47 children, 14 had attended kindergarten. The primary purpose of this study was simply to ascertain whether kindergarten attendance in general has an effect on the academic performance of first grade pupils. For this reason no effort was made to examine the types of programs existing in the kindergartens that these children attended.

Instrument

The instrument used for the first and second test administration was the Wide Range Achievement Test (WRAT) (1965 revised edition). This test measures academic achievement in the areas of: Oral Reading, Spelling and Arithmetic Computation. The Oral Reading Section of the test consists of recognizing and naming letters, and pronouncing words. The Spelling Section consists of copying marks, reassembling letters, writing the subject's name, and writing single words to dictation. In the Arithmetic Computation Section the subject must count dots, read numbers, solve oral problems, and perform written computations.

Reliability coefficient (\underline{r}) and standard error measure (SEM) of the raw scores of the reading subtest are as follows: age six, $\underline{r} = .986$, SEM = 1.36; age seven, $\underline{r} = .993$, SEM = .98. The reliability coefficient of the raw scores for the arithmetic subtest are as follows: age six, $\underline{r} = .959$, SEM = .98; age seven, $\underline{r} = .962$, SEM = .98. The reliability coefficient and the standard error of measurement of the raw scores of the spelling subtest are as follows: age six, $\underline{r} = .963$, SEM = 1.04; age seven, $\underline{r} = .962$, SEM = .98.

Procedure

In order to insure a period of adaption to the school environment, the first test was administered between the dates of October 17, and October 31, 1972. These dates coincide with the 1.2 grade level as found in the

WRAT manual. The WRAT was administered individually by two examiners to each child in both the first and the second testing sessions to insure greater reliability. The second test was administered between the dates of May 7, 1973, and May 14, 1973. The first-second test interval was six and a half to seven months.

Data Analysis

The Mann-Whitney U Test (Brunning and Kintz, 1968) for differences between independent samples was used to analyze the data. The hypothesis tested by Mann-Whitney U analysis is that the medians of the two groups are equal. A z value of =1.96 is considered significant.

The grade equivalent scores achieved by the kindergarten and non-kindergarten group on the WRAT were compared in six areas to determine whether a significant difference exists between the median scores. The six areas to be compared are: first-second test of spelling, first-second test of math, first-second test of reading.

CHAPTER III

RESULTS

The purpose of this study was to identify differences in academic achievement at the beginning and end of the school year between a group of first graders who have had some type of kindergarten experiences and a group which has had no formal pre-school experiences.

The Mann-Whitney U analysis of the first administration of the reading subtest, for the two groups, yielded a z score of -2.63. This is significant at the $p < .005$ level. The median grade equivalent score for the kindergarten group was 1.4 with the range being 1.2 to 2.5 as compared with a 1.2 median for the non-kindergarten group with their range being Kg .6 to 4.4.

A comparison of the medians of the two groups on the first administration of the spelling subtest were compared, no statistically significant difference between the median scores of either group was revealed. The Mann-Whitney U analysis yielded a z score of -.907, which was not significant.

When the medians of both groups were compared on the first administration of the arithmetic subtest, no significant difference was found. The Mann-Whitney U analysis yielded a z score of -.989, which was not

significant. Consequently, the hypothesis of this study was only partially supported at the time of the first testing.

When the second testing scores were compared in the area of spelling, a statistically significant difference occurred at the $p < .02$ level. The Mann-Whitney U analysis yielded a z score of -2.08 . The median grade equivalent score for the kindergarten was 1.75 with the range being 1.3 to 2.6 as compared with 1.6 median for the non-kindergarten group with their range being from 1.0 to 4.7.

After comparing the medians of both groups on the second administration of the reading subtest, the two groups were not significantly different. However, the z score of -1.33 does approach the significance level.

When the medians of both groups were compared on the second administration of the arithmetic subtest, it was found that no significant difference existed between the groups. The Mann-Whitney U analysis yielded a z score of $-.582$ which is not significant.

TABLE 1

Range and Median Grade Equivalent Scores for Kindergarten and Non-Kindergarten Groups on First and Second Test Administrations of WRAT

Group	Spelling				Reading				Arithmetic			
	First		Second		First		Second		First		Second	
	Range	Median	Range	Median	Range	Median	Range	Median	Range	Median	Range	Median
Kindergarten	1.2-	1.15	1.3-	1.75	1.2-	1.4	1.3-	2.0	Kg.7-	1.5	1.6-	2.3
	1.8		2.6		2.5		3.9		2.4		3.0	
Non-Kindergarten	Kg.5-	1.1	1.0-	1.6	Kg.6	1.2	1.0-	1.7	Kg.6	1.2	1.4-	2.2
	3.0		4.7		4.4		6.3		2.2		3.0	

CHAPTER IV

DISCUSSION

The research was designed to compare the academic achievement of first grade students who had attended kindergarten and pupils in the first grade who had not. The results of this research show that kindergarten attendance had a positive effect on reading skills in the beginning of the first grade and spelling skills at the end of first grade for this particular group. No significant differences were found between the kindergarten and non-kindergarten groups on the spelling subtest at the beginning of first grade. In the area of arithmetic, kindergarten seems to have produced no effect on either the first or second testing.

Apparently, kindergarten attendance did have an effect on the children's reading readiness when they entered first grade. However, this initial academic lead over the non-kindergarten group did not continue, and by the end of the first grade, it had dissipated almost entirely or at least below the conventional levels of significance. These results are contrary to Goetch's (1926) findings, that kindergarten attendance resulted in higher grade reading scores at the end of the first grade. Apparently, entry into a pre-school program at an early age does not necessarily mean better reading performance at the end of first grade. This supports Davis's findings (1952) about early school

entry and its relationship to reading as mentioned earlier.

Other studies involving relationships and comparison of early and late entry and reading achievement were made by Carrol (1964) in the third grade, Stein (1964) in the fourth and fifth grade, and Hampleman (1959) in the sixth. All found that generally the later entrants significantly excelled those who started earlier.

In the area of arithmetic, the results would indicate that kindergarten attendance did not have an effect on the first test score. The particular school in question was operating an experimental individualized math program, which may have had an effect on the arithmetic achievement test results. On the second test measure, there was no significant difference. It would appear, then, that when given an equal opportunity for individual instruction, the non-kindergarteners could develop their arithmetic skills along equal lines, with those who had attended kindergarten.

On the spelling subtest it was found that the groups were not different on the first test administration, but were significantly different on the second test administration. This result would seem to indicate that the phonic and decoding skills necessary for reading can also aid in developing the skills necessary for spelling. DeHirsch (1966) would explain this finding as being the result of perceptual motor, language, and prereading training that may have been received in kindergarten.

The results of this study tend to suggest that kindergarten attendance alone does not insure high academic achievement in first grade. Gesell (1946)

concluded after extensive research that school tasks such as reading, writing, and arithmetic, "depend upon motor skills which are subject to the same laws of growth which govern creeping, walking, grasping." This could indicate that chronological age is not always a reliable indicator of a child's academic readiness. Perhaps kindergarten should be viewed as an agent of maturation. The kindergarten experience should promote the rate of social and behavioral maturation; this in itself would help prepare a child for a more formal school experience. Maturation is interpreted by Piaget (1952) as contingent on functioning which in turn is fostered by experience and training. DeHirsch (1966, p. 85) agrees with this and adds that "maturation unfolds in continuous interaction with stimuli." These statements would tend to complement Shaw's (1952) as mentioned earlier. If kindergarten attendance could promote social and behavioral maturation, it would no doubt have a positive effect on the child's initial school experience.

In summary, the results of this research indicated that the hypothesis that attendance would effect the academic achievement of first graders in Albuquerque, New Mexico, was only partially supported. The hypothesis was supported in the area of first administration of reading subtest and second administration of spelling subtest. The hypothesis was not supported in the first test administration in the areas of arithmetic and spelling and in the second test administration in the areas of arithmetic and reading.

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APPENDIXES

APPENDIX A

Raw Scores of Kindergarten Group on First
and Second Administrations of WRAT

Subject	Spelling		Reading		Arithmetic	
	First	Second	First	Second	First	Second
1	1.1	2.3	1.4	2.3	1.6	2.4
2	1.4	2.0	1.9	2.7	2.1	2.4
3	1.2	1.8	1.3	1.9	1.2	1.9
4	1.5	2.6	2.5	3.9	2.4	3.0
5	1.1	1.6	1.2	1.6	1.6	2.8
6	1.1	1.3	1.2	1.5	Kg.9	2.2
7	1.0	1.4	1.3	1.3	1.0	1.6
8	1.1	1.7	1.3	2.1	1.0	2.4
9	Kg 6	1.7	1.2	1.6	Kg.7	1.8
10	1.1	1.6	1.6	2.9	1.2	2.1
11	1.2	1.6	1.4	1.5	1.4	2.2
12	1.6	2.3	1.7	1.9	1.6	2.2
13	1.2	2.3	1.4	2.5	1.8	2.4
14	1.8	2.3	2.1	2.7	2.1	2.8

APPENDIX B

Raw Scores on Non-Kindergarten Group on First
and Second Administrations of WRAT

Subject	Spelling		Reading		Arithmetic	
	First	Second	First	Second	First	Second
1	Kg.9	1.7	1.3	1.5	1.2	1.8
2	1.0	1.6	1.2	1.6	1.2	1.4
3	1.1	1.6	1.2	1.5	1.4	2.4
4	1.0	2.5	1.4	2.3	1.9	1.9
5	Kg.8	1.8	1.4	2.1	1.4	2.2
6	1.1	2.3	1.2	2.6	1.6	2.8
7	Kg.9	1.6	1.0	1.7	Kg.7	1.9
8	1.1	1.6	1.1	1.5	Kg.9	2.1
9	1.2	1.5	1.2	1.6	1.2	1.4
10	1.2	1.4	1.0	1.6	Kg.6	2.2
11	Kg.9	1.7	1.2	1.6	Kg.9	2.4
12	1.0	1.1	Kg.7	1.3	Kg.9	2.4
13	1.2	1.4	1.3	1.8	1.2	2.8
14	Kg.7	1.1	1.2	1.2	Kg.9	1.9
15	1.2	1.7	1.3	2.1	1.6	3.0
16	Kg.5	1.0	Kg.6	1.0	Kg.9	1.4
17	1.4	1.8	1.4	2.3	Kg.9	2.1
18	Kg.9	1.4	Kg.9	1.5	Kg.7	2.2
19	1.2	1.7	1.2	2.8	1.4	1.9
20	1.5	2.2	1.4	2.5	1.9	2.6
21	1.3	1.6	1.3	2.0	1.0	2.2
22	1.5	1.8	2.1	2.8	1.2	2.2
23	1.2	1.6	1.3	1.7	1.4	2.6
24	Kg.9	1.1	1.2	1.4	1.0	1.6
25	1.3	1.6	1.3	2.8	2.2	2.8
26	1.2	1.3	1.0	1.8	1.0	2.4
27	1.2	1.3	Kg.9	1.4	Kg.7	1.9
28	1.1	1.2	1.2	1.4	1.2	2.4
29	3.0	4.7	4.4	6.3	2.1	3.0
30	1.0	1.6	1.3	1.5	1.9	2.6
31	1.2	1.3	1.4	1.8	1.2	2.1
32	1.6	1.7	1.4	2.4	Kg.9	2.1
33	1.1	1.7	1.2	1.5	Kg.9	2.4