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Achievement and Selected Demographic Variables in Relation to Participation in the Early Childhood Education Program on the Devils Lake Sioux Reservation

John E. Derby

ACHIEVEMENT AND SELECTED DEMOGRAPHIC VARIABLES IN RELATION TO PARTICIPATION IN THE EARLY CHILDHOOD EDUCATION PROGRAM ON THE DEVILS LAKE SIOUX RESERVATION

by
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Bachelor of Science, University of South Dakota, 1964
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Dr Lemon –
Again, much thanks
for being my advisor
on my Ed.D. program.
Best wishes,

John

This dissertation submitted by John E. Derby in partial fulfillment of the requirements for the Degree of Doctor of Education from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

_____
(Chairman)

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This dissertation meets the standards for appearance and conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

_____
Dean of the Graduate School

Permission

Title ACHIEVEMENT AND SELECTED DEMOGRAPHIC VARIABLES IN RELATION TO PARTICIPATION IN THE EARLY CHILDHOOD EDUCATION PROGRAM ON THE DEVILS LAKE SIOUX RESERVATION

Department Educational Administration (CTL)

Degree Doctor of Education

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TABLE OF CONTENTS

LIST OF TABLES

ACKNOWLEDGMENTS

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ABSTRACT

The 1969 Kennedy Report revealed that one of the primary reasons for low achievement among Indian children was the negative self-image that they had of themselves. As a primary result of this study, Congress passed the Indian Education Act of 1972, which attempts to address the educational needs and concerns of Indian people, both young and old alike. The Devils Lake Sioux Early Childhood Education program has been in existence since the mid 1960s and provides three- and four-year-old children with a preschool program in the areas of cognitive thinking, social development, and improving psychomotor skills. The purpose of this program is to develop these children in a positive direction, contributing to their educational performance when entering the elementary school and beyond. The basic question to be answered was, "Does the Devils Lake Sioux Early Childhood Education program positively influence academic achievement in the elementary grades?"

Review of Related Literature

A review of related literature revealed that few studies of this type had been done on the Indian reservations across the country. The results of previous studies in the dominant society were mixed in the 1960s; and as these preschool programs continued into the 1970s, the results appeared to show more concrete findings in academic achievement in the elementary grades in favor of pupil participation in preschool programs over pupils without preschool participation.

Design of the Study

Three standardized achievement tests were used in this study to draw comparisons between pupil participation and nonparticipation in the Early Childhood Education program on the Devils Lake Sioux Reservation. In addition, selected demographic variables including sex, grade level, age, socioeconomic status, parental employment status, degree of Indian blood, tribal affiliation, parental education, and school attendance were collected for both pupil groups during the 1977-78 school year. Analysis of variance, correlation coefficients, and chi square techniques were employed in order to determine significance at the .05 level.

Conclusions

Three major conclusions were reached as follows:

1. The findings revealed significant differences between these two pupil groups on the Science Research Associates Assessment Survey instrument; and no significant differences were found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. However, it was further concluded that the statistical methods employed did not take into account the per-grade-level factor on the Science Research Associates Assessment Survey instrument where there were more non-early childhood education pupils than early childhood education pupils at the sixth grade level, thus skewing the results in favor of the non-early childhood education pupils.

2. Significant relationships were found on the Metropolitan Readiness Test instrument on the variables home stability, degree of Indian blood, tribal affiliation, and parental education of the

mother. Significant relationships were found on the Boehm Test of Basic Concepts instrument on the variable tribal affiliation. Significant relationships were found on the Science Research Associates Assessment Survey instrument on the variables achievement, sex, grade level, age, socioeconomic status, home stability, parental employment status, tribal affiliation, and parental education of the mother.

3. No significant relationships were found on the Metropolitan Readiness Test instrument on the variables achievement, sex, grade level, age, socioeconomic status, parental education of the father, and school attendance. No significant relationships were found on the Boehm Test of Basic Concepts instrument on the variables achievement, sex, grade level, age, socioeconomic status, home stability, degree of Indian blood, parental education of the father, parental education of the mother, and school attendance. No significant relationships were found on the Science Research Associates Assessment Survey instrument on the variables degree of Indian blood, parental education of the father, and school attendance.

CHAPTER I

INTRODUCTION

The 1969 Kennedy Report revealed that one of the primary reasons for low achievement among American Indian children and youth was the negative self-image which these culturally different pupils had of themselves (United States Congress Senate Report 1969).

> To a substantial extent, the quality and effectiveness of Indian education is a test of this Government's understanding and commitment. The few statistics we have are the most eloquent evidence of our own failure: Approximately 16,000 children are not in school at all; dropout rates are twice the national average; the level of formal education is half the national average; Indian children, more than any other group, believe themselves to be "below average" in intelligence; Indian children in the 12th grade have the poorest self-concept of all minority groups tested . . . (p. 3).

As a result of this nationwide study, Congress passed the Indian Education Act of 1972 in an effort to improve the educational opportunities for Indian children living in poverty areas which, for the most part, include the reservation areas across the nation (Demmert 1976).

According to William Demmert, the first Office of Education Deputy Commissioner of Education:

> Part B of the Act--special programs for Indian children--assists in developing exemplary programs that involve Indian parents and their communities in the education process. . . . It is Part B that the important community-based early childhood programs look to for the support. . . .
>
> . . . The 1972 Act has created a minor revolution in Indian education and stimulated new directions, thought, and leaders. In short, it has done for Indian education what the Elementary and Secondary Education Act of 1965 has done for the general population in the United States (pp. 8-9).

One program which received funds under Part B of this act was the Early Childhood Education (ECE) program on the Devils Lake Sioux Reservation located in North Dakota. Basically, this program has been designed for three- and four-year-old children. It is similar to Head Start and other preschool educational programs. It attempts to provide young children with an educational program which emphasizes basic learning skills including physical, cognitive, cultural, and social components. It is expected that these experiences will help develop preschool children in positive ways, and this development will be evident upon entering the elementary school environment and beyond.

The program identified has received funds from the Department of Health, Education and Welfare, Office of Education, in Washington, D.C., over a period of approximately twelve years from 1968 to the present (Lucas 1979). It was the view of the writer and of the administrator of the Early Childhood Education program that the project had been in existence for a sufficient period of time to conduct a comparative study to provide data which would help to determine whether there was significant impact on the academic achievement of children at the elementary school level who had participated in the Early Childhood Education program on the reservation.

Need for the Study

The basic question which the writer asked was, "Does the Early Childhood Education program on the Devils Lake Sioux Reservation positively influence academic achievement in the elementary grades, kindergarten through grade six?" In order to properly understand the influence of this program at the elementary school level, comparisons were made with pupils who had participated in the Early Childhood

Education program with non-early childhood education program pupils. Factors which were considered included age, sex, grade level, school attended, achievement scores, race, degree of Indian blood, tribal affiliation, socioeconomic status, home stability, parental employment status, parental education, and school attendance.

Purpose of the Study

The purpose of this study was to determine whether participation in the Early Childhood Education program on the Devils Lake Sioux Reservation had a significantly positive impact on the academic achievement of children in kindergarten through the sixth grade. Selected demographic variables were considered in order to test the significance of such participation.

Scope of the Study

The study focused on the comparison of academic achievement of early childhood education pupils and non-early childhood education pupils who later attended either the St. Michael Tribal School or the Fort Totten Community School from kindergarten through the sixth grade during the 1977-78 school year. Comparisons were made between the total population with consideration of the following demographic variables: age, sex, grade level, race, degree of Indian blood, tribal affiliation, socioeconomic status, home stability, parental employment status, parental education, and school attendance.

Definition of Terms

The terms used in this study are defined as follows:

Age of Pupil. The chronological age of the pupil in years is calculated to the nearest whole month as of July 1, 1978.

Attendance. The number of days a pupil was absent during the 1977-78 school year according to school records is the definition of attendance.

Bureau of Indian Affairs (BIA). The Bureau of Indian Affairs is a federal agency of the United States Department of Interior which is solely responsible to federally recognized tribes. The Fort Totten Agency of the Bureau of Indian Affairs serves the various needs of the Devils Lake Sioux Tribe, including responsibility to the elementary schools.

Degree of Indian Blood. The designation of Indian blood for each student was reported in the official tribal enrollment which included the following categories: (1) less than one-fourth, (2) one-fourth to one-half, (3) one-half to three-fourths, (4) three-fourths to seven-eighths, and (5) full blood. Degree of Indian blood may suggest a cultural variable as well as a racial variable in this definition.

Devils Lake Sioux Tribal Member. The pupil who was an officially enrolled member of the Devils Lake Sioux Tribe and who was residing on the reservation at the time the data was collected was designated as a Devils Lake Sioux tribal member.

Early Childhood Education Pupil. A pupil who had attended the Devils Lake Sioux Early Childhood Education program for at least one year was designated an early childhood education pupil.

Employment Status. The employment status of the parent, relative, or guardian of each pupil during the 1977-78 school year was categorized as follows: (1) fully employed, (2) partially or seasonally employed, and (3) unemployed.

Fort Totten Community School. The Fort Totten Community School is a Bureau of Indian Affairs elementary school, operating a kindergarten through grade six program, located in the community of Fort Totten on the Devils Lake Sioux Reservation.

Grade Level. The grade levels designated for this study follow the standard definition of grade level. They were kindergarten through grade six.

Home Stability. The present home stability for each pupil was determined from the responses on the Pupil Information Report Form. The information was coded into the following categories: (1) living with both parents, (2) living with father only, (3) living with mother only, (4) living with relatives, and (5) living with guardians. Home stability is a term often used in sociology. As the term is used in this study, it is intended only to imply the existence of certain family characteristics.

Indian. The definition of American Indian includes persons of both full blood and persons of mixed blood. Mixed-blood persons were included in this category if they were enrolled members of a tribe recognized by the federal government and/or if the proportion of Indian blood was at least one-eighth degree. The Bureau of Indian Affairs has used one-fourth degree of Indian blood as a criterion in order for persons of American Indian ancestry to receive government services; consequently, many tribes use one-fourth degree Indian blood as a standard to be an officially enrolled member of their respective tribe.

Non-Early Childhood Education Pupil. A pupil who had not attended either the Devils Lake Sioux Early Childhood Education program or any other school program prior to entry into kindergarten was

designated as a non-early childhood education pupil.

Other Tribal Member. The officially enrolled members of other tribes who were residing on the Devils Lake Sioux Reservation during the 1977-78 school year were designated as other tribal members.

Parental Education. The highest level of formal education attained by the parents, relatives, or guardians who were responsible for the pupil during the 1977-78 school year was categorized as follows: (1) non-high school graduate, (2) high school graduate, (3) some college education, (4) college graduate, or (5) master's degree or above.

Socioeconomic Status. The position that the parents, relatives, or guardians have attained in their community with reference to the prevailing standards of material possessions, income, education, and sociocultural identity was categorized as follows: (1) low socioeconomic, (2) middle socioeconomic, or (3) high socioeconomic. The categories identified are applied to the specific population of this study and not to the society as a whole.

Tribal Affiliation. The tribe in which the pupil was officially enrolled was designated according to tribal, school, or Bureau of Indian Affairs records.

St. Michael Tribal School. The St. Michael Tribal School was formerly the St. Michael Mission School operated by the Order of Saint Benedict and turned over to the Devils Lake Sioux Tribe in the early part of the 1970s as a tribally controlled elementary school operating a kindergarten through grade six program. It is located in the community of St. Michael on the Devils Lake Sioux Reservation.

Turtle Mountain Chippewa Tribal Member. The officially enrolled members of the Turtle Mountain Band of Chippewa Indians, some of whom were relocated on the Devils Lake Sioux Reservation at the turn of the century as a result of the Allotment Act of 1887 and currently reside on the Devils Lake Sioux Reservation, are designated as Turtle Mountain Chippewa tribal members.

Major Assumptions

Certain assumptions were made when conducting this study. The major assumptions are indicated to assist the reader in more adequately interpreting the direction of the study.

1. The instruments used to measure pupil achievement are valid and appropriate.

2. The instruments used to measure pupil achievement were appropriately administered.

3. The data contained in the school, tribal, and Bureau of Indian Affairs records were accurate.

4. The data obtained from the truant officer, school administrators, school faculty, and other school officers were based on factual knowledge and were reported accurately.

Delimitations of the Study

This study was restricted to pupils attending kindergarten through the sixth grade at either the Fort Totten Community School or the St. Michael Tribal School during the 1977-78 school year. Any generalizations to be drawn from these findings must be limited to this population.

This study was further restricted in terms of time and financial support which placed practical limitations upon the scope of research to be conducted. Specification of background variables other than socioeconomic status, home stability, sex, age, parental education, parental employment status, and various cultural factors was not attempted. Related areas such as child-rearing practices, staff turnovers, parental involvement, teacher attitudes, curriculum, school facilities, and culturally fair tests, among others, were excluded when gathering data.

The reader should also be aware that the use of the categories full blood and mixed blood in the study are, to a large extent, artificial categories imposed by the federal government and society and are not intended as "scientific" categories in any way. In the Bureau of Indian Affairs a person with one-fourth degree of American Indian blood is defined as being Indian.

Significance of the Study

1. The results of this study may be helpful to minority educators, preschool educators, school personnel, federal agencies, state agencies, and tribal officials who are directly involved with the education of Indian pupils at the preschool and elementary levels as it relates to academic achievement and dropouts.

2. The results of this study may be helpful to those government agencies which are directly responsible for providing a quality education program for Indian pupils from preschool through high school and beyond. They determine which programs should be given priority in terms of adequate funding and support services.

3. The results of this study may be helpful to the various tribes and urban Indian organizations who may wish to conduct further research into their own educational programs with special emphasis on preschool education if their children are achieving below grade level.

4. It may be in the best interest of the Devils Lake Sioux Tribe to conduct follow-up studies in the coming years as the tribe may have an interest in determining whether to establish an additional early childhood education center or whether to discontinue the existing early childhood education center on the Devils Lake Sioux Reservation.

Null Hypotheses to be Tested

The following null hypotheses were identified for testing:

Null Hypothesis 1. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools.

Null Hypothesis 2. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when sex was considered as a variable.

Null Hypothesis 3. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when grade level was considered as a variable.

Null Hypothesis 4. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when age was considered as a variable.

Null Hypothesis 5. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when socioeconomic status was considered as a variable.

Null Hypothesis 6. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when home stability was considered as a variable.

Null Hypothesis 7. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when parental employment status was considered as a variable.

Null Hypothesis 8. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when degree of Indian blood was considered as a variable.

Null Hypothesis 9. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when tribal affiliation was considered as a variable.

Null Hypothesis 10. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when parental education was considered as a variable.

Null Hypothesis 11. There will be no significant difference between the achievement test scores of early childhood education pupils and non-early childhood education pupils attending both schools when school attendance was considered as a variable.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to explore the literature on the historical background of the preschool movement from 1900 to 1965, including studies of preschool education and studies of Indian education. It was thought that using this approach would overview specific topics which would be helpful and revealing in the present investigation.

Historical Background

In the review presented in this chapter, detailed descriptions of economic and social events, educational changes, and the individuals initiating these changes cannot be discussed in great depth. The summary outline, World Events Affecting Education (see table 1), will aid the reader in fitting the outstanding developments in early childhood education with the general history of education (Broman 1978).

According to Auleta (1969), the history of education is a social history. He describes the philosophical and historical milieu of the following persons who were influential in the concepts dealing with the education of young children as follows:

> The importance of educating the young child was recognized as early as the fifteenth century when Martin Luther protested against the practice of limiting education to children of the privileged class. He insisted that all children had a right to learn, and he is recognized as the first among modern educational reformers to recommend compulsory education. . . .

. . . The unfortunate lot of the disadvantaged child has occupied the attention of reformers for centuries. Luther, Comenius, and Rosseau first proposed the revolutionary idea of educating all children no matter what their position in society; whereas, Locke had some reservations. The work of these educational innovators was continued by Johann Heinrich Pestalozzi (1746-1827), a Swiss by birth and a zealous reformer by choice (pp. 16-18).

TABLE 1

WORLD EVENTS AFFECTING EDUCATION

Political, Economic and Social Events	Educational Changes and Persons Initiating Them
	Socrates (470-399 B.C.), Athens, Greece: taught Plato (428-348 B.C.), Athens: spoke of educating children under six.
	Aristotle (384-322 B.C.), Athens: Believed in educating the young and recognized individual differences.
A.D. 400, Fall of Roman Empire. Beginning of the Dark Ages.	
	Martin Luther (1483-1546), Germany: girls as well as boys were to be taught; schools were to include a range of courses.
1492, Christopher Columbus, Italian. Thought to be an early discoverer of the American continent.	John Comenius (1592-1670), Czechoslovakia: Designed first illustrated children's textbook, Visible World, 1658. In 1628 he wrote School of Infancy. His ideas included the "school of the mother's knee"--children by six were to know the foundations of all knowledge.
1520-1648, Reformation Era.	
	Jean Jacques Rosseau (1712-1778), France: wrote Emile in 1762. This story of a child reared apart from other children by methods of experimentation is generally accepted to be the basis for modern elementary education. Stated that children have within them the power to be agents of their own learning.
1750-1850, Industrial Revolution.	

TABLE 1--continued

Political, Economic and Social Events	Educational Changes and Persons Initiating Them
1775-1783, American Revolution.	Johann Pestalozzi (1746-1827), rural Switzerland: a teacher of young children who held that public education must consider the circumstances of family and environment or education will "lend to an artificial and methodical dwarfing of humanity." No definite plan or organization.
1789-1802, French Revolutionary Wars.	Friederick Wilhelm Froebel (1782-1852), central East Germany: A student of ideas. Kindergarten was an essential step in the whole process of education because progress was hampered in later years due to lack of attention, training, and, occasionally, abuse while the child was young.
1861-1865, Civil War.	Margorethe Schurz (1832-1876), Watertown, Wisconsin: opened the first U.S. kindergarten, 1856. A student of Froebel. Six students were taught German.
1865-1870, Amendments to Constitution (13th, 14th, and 15th) abolished slavery, guaranteed civil rights, voting rights to all except women.	Elizabeth Palmer Peabody (1804-1894), Massachusetts: met Margorethe Schurz in 1859 and became interested in kindergartens and Froebel. Started the first English-speaking U.S. kindergarten in 1860 in Boston with 30 children. In 1871 Peabody began a letter-writing campaign to William T. Harris and Susan Blow opened first public kindergarten in St. Louis in 1873.
1876-1877, Alexander Graham Bell patented the first device for a telephone.	1878, Kate Douglas Wiggin, a student of Peabody, became director of the Silver Kindergarten, San Francisco, the first free kindergarten west of the Rockies.
	1880, the first teacher training program for kindergarten teachers was started in the Oshkosh Normal School. Four black women became kindergarten teachers in 1881 in Philadelphia.

TABLE 1--continued

Political, Economic and Social Events	Educational Changes and Persons Initiating Them
	Maria Montessori (1870-1952), Italy: became director of tax-supported school for small children who were otherwise left unsupervised in a Rome tenement. Her influence was to be felt in the twentieth century.

SOURCE: Betty L. Broman, The Early Years in Childhood Education (Chicago: Rand McNally College Publishing Company, 1978), pp. 26-28.

Auleta (1969) goes on to explain:

> A few years later Froebel, also a disciple of Pestalozzi, established the first kindergarten. These innovations set in motion certain practices that are yet to be realized in many parts of the world--including our own. . . .
>
> . . . In the nineteenth and early twentieth centuries, early childhood education was given special attention by Froebel, Owens, Montessori, and other prominent educators. Froebel had permanently enhanced the welfare of the young child when he established the first kindergarten. Maria Montessori reclaimed the lives of deprived young children through her educational innovations (pp. 19-23).

According to Broman (1978), the influence of Froebel carried over into America during the nineteenth century through the pioneering efforts of Margorethe Schurz, Elizabeth Peabody, and Kate Wiggin (see table 1) into the twentieth century. These individuals and their efforts laid the foundation for early childhood education in America during the twentieth century.

Preschool Movement from 1900 to 1965

Maria Montessori continued her work on an international scale at the turn of the twentieth century, and it appears to have reached an apex during the middle sixties with the advent of Project Head

Start. In order to better understand the whys and wherefores of this significant impact upon American education, it is important to find out who this extraordinary woman was and what she stood for. Love and Osborne (1971) state:

> Dr. Maria Montessori has demonstrated the value of pre-elementary education, first with handicapped children and later with normal children. The techniques she developed still have exceptional merit.
>
> According to Montessori (1914), there is an orderly process through which the minds of children can be developed as efficiently as their physical bodies. Scientific knowledge has lowered infant mortality and greater knowledge of nourishment, and care makes children healthier and more robust than ever. Parents through the ages have successfully raised children, and through experience and knowledge have done things right. However, much more satisfactory results accumulate from the scientific method. It was Montessori's contention that the mind would develop more rapidly and efficiently by the application of certain principles of learning.
>
> . . . Actually, the child in the process of developing is learning by exploring his world. With Montessori's method the child is allowed "absolute freedom" through organized work. Beginning at age three, Montessori's children received motor education, sensory education, and language through use of such apparatus as cylinders, cubes, boards with rough and smooth surfaces, weighted wood tables, colored tables with varying shades of colors, and geometric figures of varying shapes and sizes. Language was taught by naming objects, recognition, and pronunciation (pp. 13-14).

Broman (1978) has outlined some of the significant dates in this preschool movement from 1900 to 1965 as follows:

> By 1903, conflict within the International Kindergarten Union (IKU) became so disruptive that a Committee of Nineteen was established to "formulate contemporary thought."
>
> 1915, Child Education Foundation in New York City organized their first nursery school, Montessori oriented.
>
> 1919, New York City, Harriet Johnson (a nurse) established laboratory nursery school now called Bank Street.
>
> 1924, the professional journal Childhood Education published by IKU.
>
> 1926, National Committee on Nursery Schools formed; Jean Piaget published The Language and Thought of the Child; sees intelligence development as a continuous process with four main periods of

growth: sensory motor (0-2 years), preoperational (2-7 years), concrete operations (7-11 years), and formal operations (11 years and up).

1930, National Association for Nursery Education (NANE) formed; IKU enlarged its membership and changed name to Association for Childhood Education (ACE).

1932, the project method, developed by Kilpatrick, was common curriculum procedure: article, "The effect of preschool attendance upon the IQ," by Beth Wellman. In lab studies at Iowa Child Welfare Station she discovered an average gain of about seven points between the fall and spring tests.

1943, New York City established comprehensive day care centers, designed for health care, to meet social and emotional needs, and to provide educational experience.

1948, World Organization for Preschool Children was founded, meets every 3rd year in cities around the world; National Committee for Early Childhood Education is the U.S. member organization.

1964, NANE organized to become National Association for the Education of Young Children; Stability and Change in Human Characteristics, by Benjamin Bloom, illustrates the importance of the early years in life and the difficulty of effecting change later.

1965, Elementary-Secondary Education Act; Project Head Start: to provide comprehensive health and nutritional program and educational experience for four- and five-year-old children of poverty. By 1972, Head Start involved younger children because most states had public kindergarten programs for five year olds (pp. 69-70).

It was during the 1960s that the national conscience about the problems of poverty, especially its lifelong disadvantages for children, was roused (Spodek and Wahlberg 1977). Morrison (1976) concludes that the most rapid period of growth in early childhood education has occurred from about 1965 to the present.

Finally, according to Biber (cited in Spodek and Wahlberg 1977), the cognition of early childhood education programs has two perspectives: the first reflects the century-long evolution of design and philosophy in preschool education; the second was influenced by relatively recent programs developed in response to social crisis and controversial social demands. Evans (1975), in his book, Contemporary

Influences in Early Childhood Education, summarizes recent changing patterns of early childhood education as follows:

> . . . the strong commitment by many educators to early childhood education has for many years been based on the belief that children will be more likely to realize their developmental potential with such educational experiences than without it. But only recently has the search for a better yield from early educational programs involved a careful examination of cognitive behavior. As Kohlberg (1968) suggests, a principle contribution to this search has been a growing awareness among educators that differences in early academic achievement among children are due less to formal schooling functions than to children's general background of preschool experience and the personal characteristics they develop during the early years of life. Yet basic schisms in educational and psychological thought have continued to affect program development, particularly at the pre-primary level. Hopefully these theoretical conflicts among adults do not occur at the expense of children. Possibly the superordinate issue is what specific experiences are best for individual children at what points in time rather than what one approach or set of experiences is best for all children simultaneously and at a uniform point in the developmental sequence . . . (p. 34).

In conclusion, the preschool movement at the turn of the twentieth century started out with humble beginnings. By 1965, the movement appeared to have reached full national support with the passage of the Elementary and Secondary Education Act (including Project Head Start), which after eleven years operated with a budget of $450 million ("Vindication of Early Childhood Programs" 1977).

Studies of Preschool Education

Since the Civil Rights movement of the 1960s, serious attention has been given to the concept of equal educational opportunity as one means of providing children from all groups with the chance of developing their fullest potential. This quest for equality of educational opportunity has led educators to concentrate on compensatory education. In this approach, it is hoped that equality will be achieved when the so-called "culturally deprived" child catches up the norms attained by

the white, middle-class students (Bloom et al. 1965).

According to Hovey (1975), the child entering preschool brings the images, symbols, sensorimotor experiences, language, learning style, and cultural traditions developed through interactions in his home and immediate community. In general, as the work of Bloom (1964), Deutsch (1965), and many other students of child development shows, there is a close relationship between the socioeconomic status of a family and the school achievement of its children. Coleman (1966), in a national study of educational achievement, found the socioeconomic status of the home to be the most powerful in predicting the child's academic achievement. Mosteller and Moynihan (1972), responding to the Coleman Report, stated:

> The results of the examination of relative importance of different school factors were that the most important cluster of factors was the social backgrounds of other students, the second most important was teacher's characteristics, and the lowest level of importance, explaining very little additional variance in most regions, was school facilities and curriculum characteristics (p. 157).

There is abundant evidence which indicates that school achievement depends, to a large extent, on the children's experiences in their family and their local community or neighborhood. If their parents read widely, read to them, use large vocabularies while conversing at home, take them to museums, provide children's encyclopedias in the home, and set examples of educated behavior, the children will generally follow in their footsteps (Havighurst 1970). However, under conditions of supposed cultural deprivation, fewer words will be used to convey thought. Monosyllables, grunts, and gestures are more likely to be the basic form of communication. It is assumed this is true because parents lack verbal ability and possibly do not have the

energy to spend time in verbal interchange (Love and Osborne 1971).

The results of a number of studies of disadvantaged children are summarized by Hess and Shipman (1965) as follows:

> Children from deprived backgrounds score well below middle-class children on standard individual and group measures of intelligence (a gap that increases with age); they come to school without the skills necessary for coping with first grade curricula; their language development, both written and spoken, is relatively poor; auditory and visual discrimination skills are not well developed; in scholastic achievement they are retarded an average of two years by grade six and almost three years by grade eight; they are more likely to drop out of school before completing a secondary education; and even when they have adequate ability, are less likely to go to college (p. 869).

Love and Osborne (1971) are of the strong opinion that this disadvantaged child must be made capable to getting along in "standard" America. Furthermore, it is this incompatibility that is resulting in poor school grades, a feeling of inferiority, and resentment developing into hostility. By dropout time, there is likely to be a feeling of anger, bitterness, hostility toward authority, discouragement, and defeatism which eventually results in unhappiness, continued poverty, social problems, crime, and suicide.

At this point, it is important that we take into consideration the fact that education begins at birth and that the parents are the child's first teachers. This is where the educative process begins. The infant must be taught through the five basic senses--touch, taste, smell, sound, and sight. Interestingly, one of the conclusions reached by Bloom (1964) in his book, Stability and Change in Human Characteristics, was as follows:

> When a number of longitudinal studies are compared with each other and allowances are made for the reliability of the instruments and the variability of the samples, a single pattern clearly emerges. . . . Both the correlation data and the absolute scale of intelligence development make it clear that intelligence increases with age. Both types of data suggest that in terms of

> intelligence measured at age 17, about 50 percent of the development takes place between conception and age 4, about 30 percent between ages 4 and 8, and about 20 percent between ages 8 and 17 (p. 88).

The necessity of continuous early education for young children is confirmed by a large body of research, but research also confirms the fact that parents are the most influential educators of their own children (Schaefer 1973). What parents do in a child's early years in managing the environment is a model for the child's performance during these years and later on in school (Gordon 1972). This power of parental influence, if well motivated and directed, holds great promise for the child's general psychological development (Butler 1970). Both parents have a great influence, but educators are discovering in programs for young children that it is the mother who has more influence on a child than anyone else (Jester 1969). After nearly two decades of full-time research with children under six years old, Burton White (1974) has concluded that the family is the primary educational delivery system. Perhaps most persons tend to equate learning with schools; whereas, the home, during the child's earliest years, appears from the preponderance of research evidence, to be his most likely learning laboratory. Specifically, in two-parent families, fathers and mothers have roles that have substantial similarities but are also distinct. Although both may contribute to their child's development, they do not contribute equally or in the same way (Clarke-Stewart 1977).

Based on the preceding data, it may be hypothesized that a higher level of parental education is associated with greater academic knowledge, increased awareness of public affairs and popular culture, more informed perceptions of school, and continued seeking of new

knowledge and motivation for learning (Hyman et al. 1975). Inevitably, the criterion for an effective home or good school has been determined by how much influence it has on the academic achievements of students (Kifer 1976). Successful parenting, however, is not limited to middle- or upper-income groups. There are indifferent parents at all levels of society, and some of the best parents are found among the economically disadvantaged (Moore 1976).

Although there are many disagreements about early childhood education, everyone who has any positive feelings regarding early childhood education believes that educating the very young is probably one of the wisest investments available to most school systems (Weber 1969). Supporting this contention, cities like Cincinnati and San Francisco have been proponents of early childhood education since the 1870s.

Seefeldt (1977) concluded that early preschool educational experiences can be effective in fostering the academic achievement and in maintaining the intellectual development of children. On the other hand, preschool compensatory education, followed by unimproved public school experiences, hardly seems worth the effort (Nimnicht 1977). An alternative approach argues that in our pluralistic society the school must relate to the particular cultural patterns and values experienced by the child in his community. Equality will be achieved by allowing the "culturally different" child to develop in accordance with his/her unique cognitive style and with his/her motivation for learning derived from a positive self-concept (Hovey 1975).

Although research is available demonstrating the potency of early educational experiences to immediately affect the achievement

and intellectual development of children, few studies have explored the long-term effects of such programs. Many questions about the effectiveness of early educational experiences to affect later academic achievement and intellectual development remain unanswered. A study done by Goulet et al. (1974) presents strong reasons to believe that both the amount of time spent in school and chronological age are positively related to mental age.

Results of studies using regression analysis techniques clearly point out interrelated and cumulative effects of family variables, including parental education, socioeconomic status, etc., on the child's academic achievement and cognitive-perceptual performance (Shipman 1976). In a previous longitudinal study of 1,800 children in Head Start programs in four poverty areas, Shipman (1971) noted that these children demonstrated a greater ability in understanding language than in using it. Despite site differences requiring further clarification, preliminary data did suggest that developmental differences were found in cognitive skills and styles but not in personal-social variables. The most compelling finding, however, was the wide range of individual differences exhibited within this relatively restricted sample of children. Low-income youngsters were not in a homogeneous group. Children from low-income families span a much wider range of cognitive, perceptual, affective, social, and physical functioning than some would have us believe (Mann 1977).

The present findings suggest, moreover, that the encouragement of certain behaviors such as achievement, motivation, persistence, and concentration during the preschool years may act to facilitate the child's acquisition of the basic academic skills of reading and

mathematics (Bridgeman and Shipman 1975). Other findings (Moore and Moore 1975) in the areas of neurophysiology, cognition, vision, hearing, etc., have raised questions about expecting children to pursue the basic skills of reading, writing, and arithmetic on a deliberate academic basis before they are between eight and ten years old and their neurological, cognitive, and affective development has reached reasonable levels of maturity--an integrated maturity level or a safe time to enter school.

Other findings support the hypothesis that Head Start programs are quite homogeneous in their ability to promote cognitive development. One such study by Weisberg (1974) reveals that Head Start is effective in accelerating the growth rate of disadvantaged preschoolers in a wide variety of cognitive skills. When compared to conditions where there are no preschool programs, the effects of Head Start programs are quite homogeneous, but they show systematic differences between sponsored and non-sponsored programs.

Social policy decision makers concerned with preschool intervention programs wanted to find whether or not Head Start and Follow Through programs do or do not produce lasting measurable benefits. The most valuable of the studies conducted have been the longitudinal studies, several of which have been reviewed by both Brofenbrenner (1974) and Ryan (1974). Both authors concur that preschool intervention is effective in producing substantial gains in IQ scores which are maintained for the duration of the project. But the long-term stability of such IQ changes, as well as the questions of whether there are other kinds of effects, remain unanswered. While the children are enrolled many studies are made regarding the stability of

learning, but not much data is gathered after the termination of the program. In an earlier study of Head Start children, the Ohio University-Westinghouse Report concluded that at the end of the second grade any gains through Head Start had disappeared (Seitz 1976).

According to the article, "Vindication of Early Childhood Programs," which appeared in the March 5, 1977, issue of Science News, it conveyed the same message:

> Yale psychologist Victoria Seitz reported that delayed effect (of preschool programs) may be particularly important for girls. In one group she studied, girls who had participated in Head Start and Follow Through programs did not show any superior mathematics ability over controls when tested in the third grade, yet they scored significantly higher in the eighth grade. . . .
>
> . . . The relative effectiveness of various individual programs remains unclear. Palmer summarizes the results of studies involving, among others, the Montessori method (emphasis on self-initiative) and the Bereiter-Englemann method (involving rigorous drill). Not surprisingly, the Montessori children initially scored higher on measures of inventiveness and curiousity, while the Bereiter-Englemann children outperformed others in academic achievement. However, the differences virtually disappeared by the end of the second grade. . . .
>
> . . . Ultimately these programs could result in "considerable economic benefit" for society. Bernard Brown says: By raising the abilities of disadvantaged children up to normal, preschool programs have helped save larger amounts of money than would have been needed later for remedial education. An outstanding example of this was cited by John H. Meier of the Office of Child Development at a Denver press conference. In Gainesville, Florida, he said, "only 1 percent of the children whose parents had participated in a home based education program needed special education by the fifth grade. Nearly 30 percent of the students needed special help by then " (p. 151).

According to Superintendent of Public Instruction, Wilson C. Riles, California passed its first test on early childhood education programs by restructuring kindergarten through third grade. Assessment of pupil achievement was weighted at 10 percent of early childhood education's first-year evaluation. Studies prepared by his department of this program during the 1973-74 school year revealed that pupils in the early childhood education programs demonstrated

substantial gains in many schools, gains that were beyond his expectations. These gains were particularly impressive to him because 50 percent of the participating schools were serving poor children (Riles 1975).

Responding to Riles's article which appeared in the September 1975 issue of Phi Delta Kappan was a diametrically opposing view written by Carolyn H. Denham (1976), Associate Professor of Educational Psychology at California State University-Long Beach, who insisted the article lacked the necessary data upon which to draw any conclusions. She further stated:

> The State Department of Education reported that those pupils in schools receiving early childhood education funds typically attained 1.1 month's growth in reading achievement for each month of instruction. . . . The average child, with no special instruction, should gain 1.0 month per month instruction. According to the head of the office responsible for the evaluation, the report contains language such as the following: "The success of these (mathematics) programs can be judged by a reported typical gain of 1.2 months for every month of instruction." Riles, in the report's forward, attributed causality to the data: "This evaluation report shows that after the first year of operation, the early childhood education program resulted in significant improvement in pupil achievement" (p. 530).

Ada J. Mann (1977), in her federal study, A Review of Head Start Research Since 1969 and An Annotated Bibliography, summarizes her findings as a result of her extensive research as follows:

> What impact does Head Start have on the cognitive development of children?
> . . . Does participation in full year Head Start produce gains in intelligence?
> Yes. The majority of studies showed improvement in performance on standardized tests of intelligence or general ability.
> . . . Does participation in full year Head Start produce gains in academic achievement?
> Yes. Studies reported that Head Start participants performed equal to or better than their peers when they began regular school and there were fewer grade retentions and special class placements.

. . . Does participation in full year Head Start programs produce significant gains in cognitive development?
Yes. Studies reported that Head Start was effective in preparing children for later reading achievement and intelligence scores were improved.

. . . Does participation in summer Head Start programs produce significant gains in cognitive development?
No. The majority of research revealed that children who participated in short term programs did not achieve significant gains.

. . . Does one program approach produce more significant gains than another?
No. In aggregate the programs produce gains, but no one program or group of programs seems to be superior to another (p. 5).

Other studies on the effectiveness of early childhood education programs reveal that children from small families secured higher scores on nine skill areas on the Iowa Test of Preschool Development (Scott and Seifert 1974). Austin and Postlethwaite (1974) suggest that gains made in achievement, based on early childhood education, may be due to the sensorimotor experiences which are so commonly a part of preschool programs. They further suggested that the carefully planned and sequenced curriculum approach to teaching mathematics may have a significant effect as well. Bridgeman and Shipman (1975) are of the opinion that affective and social behaviors interact in the acquisition and performance of cognitive skills.

Other longitudinal data on the effects of Head Start by Brofenbrenner (1974) cautiously assess findings of Head Start and Follow Through and suggest that such group intervention projects provide few lasting effects. Their reason is that such programs not only provide an educational program but also emphasize the needs of children from low-income families in the areas of health and social services.

Studies of Indian Education

According to the 1970 National Study on Indian Education and the 1969 Kennedy Report, Indian children did not score as well on school achievement as did the children of the white majority (see tables 2, 3, and 4). Other publications as far back as the 1928 Merriam Report have reported this generally understood fact (Havighurst 1970). In order to better illustrate these discrepancies, tables 2, 3, and 4 represent comparisons of educational and school achievement of Indian and non-Indian adults and children.

Porter (1973), in response to the Havighurst studies (which he contends support government policy), states:

> The NAACP report stated, unequivocally, that "by every standard, Indians receive the worst education of any children in the country." Things are beginning to change, but at glacial speed. In July, 1970, President Nixon directed that "every community wishing to do so should be able to control its own Indian schools. . . ."
>
> . . . In the meantime, although declared BIA policy for 35 years has been to phase out boarding schools, there has been little difference in boarding school enrollment since 1930. The BIA continues to operate boarding schools and has no plans to eliminate them in the near future. And most Indian children are forced to attend federal or state schools which are alien, imposed institutions removed from the needs of Indian people (p. 31).

Several studies of mental alertness and of basic development have been made with Indian children, and these studies show the Indian children to be approximately equal in measured intelligence scores as the white children of the surrounding society. For example, on the Goodenough Draw-A-Man Intelligence Test, which is a test of mental alertness and does not require language, Indian children show about the same level of performance as white children. Actually, the 1,700 Indian children who took this test under auspices of the National Study on Indian Education made an average measured intelligence score of

101.5, which is slightly, but definitely, superior to the average of white children (Levensky 1970).

TABLE 2

COMPARISON OF INDIAN SCHOOL CHILDREN WITH NATIONAL NORMS ON SCHOOL ACHIEVEMENT TESTS

	Grade Level Achievement		
Indian Community	National Norm	Indian Group	Number of Students
Yakima (1966)	4.9	4.0	14
Smartlowit	5.9	4.9	18
	6.9	5.3	17
National Sample (includes 40% white children) Coombs, *et al*	4.1	4.3	3206
	5.1	5.0	3077
	6.1	5.5	3006
	7.1	6.6	3056
	8.1	7.2	2863
	9.1	7.9	2834
	10.1	9.2	2314
	11.1	9.9	1723
	12.1	10.2	1527
Navaho (Rough Rock and Rock Point)	2.9	1.8	61
	3.9	2.7	61
Erickson (Norms based on years of schooling) (1968)	4.9	3.3	62
	5.9	4.0	45
Pine Ridge (Sioux) (Bryde)	4.2	4.9	65
	5.2	5.7	107
	6.2	6.7	93
	7.2	7.0	119
	8.2	7.5	147
Sioux Elementary Schools (38) in Aberdeen area of BIA. (1965)	4.1	4.3	636
	5.1	5.2	627
	6.1	5.8	667
	7.1	6.9	618
	8.1	7.7	624

SOURCE: Robert J. Havighurst, Final Report of the National Study of American Indian Education: Mental Development and School Achievement of American Indian Children and Youth (Washington, D.C.: U.S. Office of Education, 1970), p. 10.

TABLE 3

TEST SCORES OF AMERICAN INDIAN CHILDREN

	Grade levels behind average white students of non-metropolitan areas		
Grade	Verbal Ability	Reading Comprehension	Math Achievement
6	1.3	1.8	1.8
9	1.3	1.9	2.2
12	2.5	2.8	3.0

SOURCE: Robert J. Havighurst, Final Report of the National Study of American Indian Education: Mental Development and School Achievement of American Indian Children and Youth (Washington, D.C.: U.S. Office of Education, 1970), p. 11.

Other studies reveal that communication gaps exist between the home and school environment in the Indian community (Erikson 1939) and that the federal government recognizes this communication gap at an early age in the educational process (Wax et al. 1964). Havighurst (1970), in his exhaustive national study on Indian education, reveals the following:

> School achievement is well known to be related to a child's experience in his family, to his school experience, and to his inherited intellectual ability. Since the Indian children do not differ from other groups of children in their inherited intellectual ability as far as we know, group differences in school achievement must be due to the family or the school factors.
>
> . . . Since most Indian children are raised in poor families, by parents who read little or not at all, and since most Indian children live in communities of poor people, we should expect them, like the children of poor whites, or blacks, or Spanish-Americans, to do poorly in school, on the average. However, we should expect a good performance from a minority of Indian children, as we do from the children of other disadvantaged families (pp. 1-2).

TABLE 4

COMPARISON OF LEVEL OF EDUCATIONAL ACHIEVEMENT
OF INDIAN AND NON-INDIAN CITIZENS

	U.S. Non-Indian Average	Indian Average	Deficits to be Corrected
Years schooling	10.6	8	2.6 years behind in 1960
Overage students (in all grades stated as a % of total enrollment)	Under 20%	42% (7% 3 years or more behind)	20% overage
Academic achievement stated in average number of years behind on standardized achievement tests:			
gr. 2-5	0	1 yr.	2 years retardation to overcome by end of high school
gr. 6-8	0	2 yrs.	
gr. 9-12	0	2 yrs.	
Kindergarten enrollment as % of eligible children	73% of all 5-year olds, (1965)	under 10% (820 children in Kindergarten in FY 1969)	13,000 more Indian children in Kindergarten

SOURCE: U.S. Congress, Indian Education: A National Tragedy - A National Challenge (Washington, D.C.: Senate Report, 1969), p. 63.

The data from a number of testing programs involving Indian children since 1951 appear to be interpreted adequately by the foregoing studies, with one exception (Havighurst 1970). This was a study done by John Bryde in the late 1960s on the Pine Ridge Indian Reservation in South Dakota of Oglala Sioux pupils attending both federal and parochial elementary schools. In his study, Bryde compared the test results of Indian pupils with the national norms on the

California Achievement Test and found that the Sioux pupils were slightly above the national norms at the fourth, fifth, and sixth grade levels, and then their academic performance drops to well below the national norms in the seventh and eighth grades (see table 2). This has been called the "cross-over phenomenon" and has been quoted widely. Bryde (1970) summarizes the situation in the following manner:

> It takes the young Sioux pupil about three years to become acclimated to this new situation (school). During this time, which roughly comprises the first three grades, Sioux Indian pupils, as a group, do not come even close to national norms on standardized tests. At that time, these children thus range from six months to a year-and-a-half behind standardized achievement norms. Their IQ's, however, are perfectly normal. With almost dramatic suddenness, at about the fourth grade, Indian students achieve, and even excel, standardized norms. This "golden age" of achievement often lasts until the seventh grade. At about the seventh and eighth grades, there begins a steady decline in achievement (pp. 51-52).

Pfeitler (cited in Dunfee 1970) maintained that a lack of consideration for the language and culture of the Indian has resulted in serious damage to the children's self-concept, aspiration, and motivation. Erikson (1968) offered the following analysis of the roots of motivational conflicts of Sioux Indian children:

> The conquered tribe has never ceased to behave as if guided by a life plan consisting of passive resistance to a present which fails to reintegrate the identity remnants of the economic past, and of dreams of restoration in which the future would lead back into the past, time would again become a historic hunting grounds unlimited, and the buffalo supply inexhaustible--a restoration which would permit again the boundlessly, centrifugal life of hunting nomads. Their federal educators, on the other hand, preach values with centripetal and localized goals: homestead, fireplace, bank account--all of which receive their meaning from a life plan in which the past is overcome and in which the full measure of fulfillment in the present is sacrificed to an ever-higher standard of living in the future. . . . No wonder that Indian children, forced to live by both these plans, often seem blocked in their expectations and paralyzed in their ambitions (p. 48).

Similarly, in 1760, a spokesman for the Onodaga Indians of New York said to the English colonizers: "Brothers, we thank you for educating our children in your schools, but we have observed that for a long time after our children return home they are not good for anything" (Hovey 1975, p. 17).

According to Demmert (1976), the problems of educating these Indian students were first brought to the nation's attention with the first major study on Indian education, the Merriam Report of 1928. Among its major findings, this report revealed that: (1) Indians were excluded from management of their own affairs; (2) Indians were receiving a poor quality of services (especially health and education) from public officials who were supposed to be serving the Indian's needs; and (3) Indians were under an imposed educational system of another culture.

About one-third of Native American children are still attending boarding schools, which were created approximately one hundred years ago for the purpose of assimilating Indian youngsters into the mainstream. However, this approach has failed in its purpose and the Bureau of Indian Affairs is trying to phase out their boarding schools, but as noted earlier, at a very slow pace. Richard Margolis (1973), freelance writer for the New York Times, states:

> But the B.I.A. schools have failed, in most instances, either to assimilate the children or to educate them. Many children have resisted "whitewash," have dropped out; others have resorted to alcohol and drugs. The suicide rate among Indian teenagers is four times the national average for the age group. . . .
>
> . . . It is for such reasons that Indian leaders have been calling for the establishment of Indian-controlled schools on reservations, where Indian children can absorb white learning without denigrating or destroying Indian tradition . . . (p. 63).

Presently, the Bureau of Indian Affairs is officially committed to phasing out these schools since they have failed either to assimilate the children or to educate them (Hovey 1975).

The Bureau of Indian Affairs wants to be responsible to Indian needs and desires. It recognized that the primary responsibility for education rests with the parents of the Indian children themselves. The objectives include providing for a legitimate Indian voice in all education programs operated by the Bureau of Indian Affairs and to help Indian communities provide for each student a program of high quality which will prepare the individual to make informed choices throughout his life (United States Department of Interior 1974).

Thus, as a result of the passage of the Indian Self-Determination and Educational Assistance Act (Public Law 93-638) of 1974, every tribe has been given the opportunity to contract various governmental services, including educational programs. The Bureau of Indian Affairs's objectives are as follows:

> "(1) Every one of the present 200 Bureau schools will, by 1976, be operated by a management system chosen by the beneficiaries of that school--either Indian operation, public school, or BIA.
> "(2) Every Bureau school will be operated with the policy advice of a community or tribally-elected school board. In this option final policy and personnel decisions rest with the BIA.
> "(3) Parents of Indian children in public schools will be helped to exercise their just measure of control in the education process through the public school boards and parent involvement possible in the various public school systems" (United States Department of Interior 1974, p. 4).

As a result, many tribes are taking a "wait-and-see" attitude on this public law and are somewhat leery of federal politicians for fear of ultimate termination which, in fact, happened to several tribes during the Eisenhower administration of the 1950s.

According to Ahler (1977), it is important to understand the formal educational systems of the Plains Indians of the past as we look to the future.

> Formal education among Native Americans on the Plains, as well as nationally, is a cumulative history of mission schools primarily dedicated to the conversion of Indians to Christianity, of federal boarding and day schools and of state public schools stressing acculturation and assimilation into mainstream America, and finally of recent trends toward Indian-controlled schools which recognize and respect the traditional cultures into which the Native American has been and is still being educated and enculturated (p. 27).

Other related factors of Indian education which need to be included in this discussion involve the tribal affiliation and degree of Indian blood. In examining research with tribes located in the Plains region, Ahler (1977) found that the results appear to be mixed.

> The Cress and O'Donnell (1974 11:306-309) research on behavior and personality among Oglala Sioux produced results indicating that mixed-bloods had higher achievement and greater popularity than did the full-bloods. Self-concept and academic self-assessment were found by Hoffman (1969-70 30:1226B-1227B) to be significantly related to educational aspirations among Indian students in Montana. . . . John Bryde (1970, p. 141) concludes that among the Indian groups categorized by "degree of Indian blood" there were no significant differences in achievement but there were significant differences in personality variables: "the more Indian blood one had the more disruption he revealed. . . ."
>
> . . . Garth (1923), in examining the intelligence of several Indian groups including some on the Plains, produced results suggesting that mixed-bloods had higher intelligence scores than full-bloods and that nomadic tribes excelled sedentary tribes in intelligence scores. . . . Telford (1932 14:113-145) reports that among Sioux and Chippewa students in North Dakota no relationship was found between the degree of Indian blood and test performance. . . .
>
> . . . In summary, the majority of research studies so far accomplished in Plains Indian education have been scattered and narrow in scope. Findings from one research project to the next are often conflicting and fail to lend themselves to any definite statement on Native American education (pp. 30-33 passim).

It appears that more Indian people need to become involved in the education of their own children in the 1980s in order to reverse the past trends which have been of a dismal and negative

nature. According to Spilka (1970), based on his study of the Pine Ridge Indian Reservation, he states:

> It is extremely difficult to expect Indian children to become successful learners if their parents and community are divorced from schools. The latter must be an integral aspect of the former, which, of course, means the active involvement of parents in the formulation of policy regarding the operation of the schools. There is no doubt that this is coming and the schools should take an aggressive role in bringing it about (p. 428).

It seems apparent, from this review of literature, that Indian people are increasingly being given an opportunity to control their own educational systems at the local level; thus, every tribe and Indian organization must take on this responsibility in the best interest of their children.

CHAPTER III

DESIGN OF STUDY

Description of the Population Studied

Included in the study were two types of elementary pupils previously enrolled in predominately Indian schools located on the Devils Lake Sioux Reservation in North Dakota. The first type were those elementary pupils who had not participated in an early childhood education (non-ECE) program either on the Devils Lake Sioux Reservation or elsewhere. The second type were those elementary pupils who had participated in an early childhood education (ECE) program either on the Devils Lake Sioux Reservation or elsewhere. All of these pupils attended either the St. Michael Tribal School or the Fort Totten Community School during the 1977-78 school year.

There were a total of 302 elementary pupils from both of the schools represented in this study. The total number of pupils included 110 elementary pupils who had not previously participated in an early childhood education program and 192 elementary pupils who had previously participated in an early childhood education program. There were fifteen elementary pupils who were eliminated from this study because their records were incomplete.

Both schools were contacted in person and with a follow-up letter from the Acting Education Program Administrator for the Bureau of Indian Affairs at the Fort Totten Agency (appendix A). Confirmation

of this letter was made by the writer via telephone to the Acting Education Program Administrator so that the process of data collection could begin during the summer of 1978.

Both of these schools are geographically located in the state of North Dakota. These schools were unique to the extent that both (1) were located within the boundaries of the Devils Lake Sioux Reservation and enrolled both Indian and non-Indian pupils with the former comprising approximately 97 percent of the pupil enrollment and (2) each had approximately the same number of pupils enrolled in the first through the sixth grades with 132 enrolled at the Fort Totten Community School and 135 pupils enrolled at the St. Michael Tribal School.

Sources of Data

The sources of data for use in this study were the following:

1. Academic achievement composite test scores which were available at both schools;

2. Bureau of Indian Affairs records located at the Fort Totten Agency;

3. Devils Lake Sioux tribal records located at their Fort Totten headquarters' offices;

4. Elementary pupils' records which were located at each school; and

5. Personal interviews with the various program personnel, including the Bureau of Indian Affairs social workers, the principals from both schools, the school secretaries from both schools, the Fort Totten school district truant officer, the secretary for the Devils Lake Sioux Early Childhood Education program, the teachers from both

schools, and the support staff from both schools.

Instruments

The instruments used in this study were the Metropolitan Readiness Test (MRT), Boehm Test of Basic Concepts (BTBC), and Science Research Associates Assessment Survey (SRA). The Pupil Information Report was used to collect the data on the rest of the selected demographic variables previously mentioned in chapter I (appendix B).

The Metropolitan Readiness Test, authored by Gertrude H. Hildreth, Mary E. McGauvran, and Nellie L. Griffiths, was devised to measure the extent to which school beginners have developed in the several skills and abilities which contribute to readiness for kindergarten instruction. Designed for testing pupils at the end of the kindergarten year or the beginning of the first grade, these tests provide a quick, convenient, and dependable basis for early classification of pupils to help teachers manage the instructional effort more efficiently. The tests are not designed as measures of the effectiveness of kindergarten programs, though it is entirely reasonable that an effective and good preschool program should contribute to development of some of the abilities covered by the test (Manual of Directions 1969).

According to the Manual of Directions (1969), six tests are included in the Metropolitan Readiness Test as follows:

> Test 1. Word Meaning: A sixteen-item picture vocabulary test. The pupil selects from three pictures the one that illustrates the word the examiner names.
>
> Test 2. Listening: A sixteen-item test of ability to comprehend phrases and sentences instead of individual words. The pupil selects from three pictures the one which portrays a situation or event the examiner describes briefly.
>
> Test 3. Matching: A fourteen-item test of visual perception involving the recognition of similarities. The pupil marks the

one of three pictures which matches a given picture.

Test 4. Alphabet: A sixteen-item test of ability to recognize lower-case letters of the alphabet. The pupil chooses a named letter from among four alternatives.

Test 5. Numbers: A twenty-six-item test of number knowledge.

Test 6. Copying: A fourteen-item test which measures a combination of visual perception and motor control. A seventh, optional test, Draw-A-Man, provides an index of general intellectual maturity. This is an adaptation of one drawing from the Goodenough-Harris Drawing Test, published by Harcourt, Brace, and World in 1963 (pp. 25-26).

According to Hammill and Wiederholt (1971), the derived reliability coefficients for the Metropolitan Readiness Test were, for the most part, comparable to those reported in the manual of directions. In their studies, strongest agreements were obtained on subtests requiring arithmetic or perceptual-motor skills; whereas, the reliability of Word Meaning and Listening was too low to have diagnostic usefulness. Other subtests with low reliability involved comprehension of meaningful auditory symbols, i.e., speech. They were of the opinion that the reliabilities of the remaining subtests were quite adequate, since they were greater than .70 reliability.

The Boehm Test of Basic Concepts (BTBC), authored by Ann E. Boehm, is a picture test which evaluates the child's understanding of spatiality, quantity, and time concepts. The primary purpose of this test is to diagnose the understanding of specific, commonly used concepts grasped by individual pupils. This suggests that this test is criterion referenced, with individual pupil's scores on each concept measured (Buros 1978). The test manual discusses the technical aspects of this instrument, including the rationale and purpose.

According to Boehm (1971), the purpose of this instrument is twofold: (1) to identify individual children whose overall level of concept mastery is low and who may be in need of special attention,

and (2) to identify individual concepts which large numbers of children in a class may be somewhat unfamiliar. The Boehm Test of Basic Concepts (BTBC) is a useful diagnostic/prescriptive instrument for teachers of primary children.

Administering this test is a simple and straightforward process with easy-to-understand directions. Form A and Form B are administered in precisely the same manner. Each of the forms consists of three practice examples and twenty-five test items which are arranged in order of increasing difficulty. Each item consists of a set of pictures about which statements are read aloud by the classroom teacher. These statements briefly describe the pictures and instruct the pupils to mark the one which illustrates the concept being tested.

According to the test manual, the reliability coefficients on "Form A were .90, .85, and .81 for the kindergarten, grade one, and grade two samples, respectively. For Form B, the [reliability] coefficients were .84, .83, and .87 for the kindergarten, grade one, and grade two samples, respectively (Boehm 1971, p. 28).

The Science Research Associates Assessment Survey, authored by the Science Research Associates, Inc., was designed to measure general academic progress and provide information on both individual pupils and classes. There are two editions in the achievement series--the primary and the multilevel. Within the primary edition, Primary I can be used from the middle of grade one through the middle of grade two and Primary II from the middle of grade two through the middle of grade four. Each level consists of three test booklets--Language Arts, Reading, and Mathematics.

The multilevel edition consists of three separate, but overlapping, levels (Blue, Green, and Red) of graduated difficulty intended for use in grades four through nine. Each booklet contains tests in reading, mathematics, language arts, social studies, use of sources, and science. Social Studies, Use of Language Arts, Reading, and Mathematics tests constitute the 3R core of the achievement series (Science Research Associates, Inc. 1972).

The reliability of this test for Primary I, Primary II, and the Multilevel (Blue, Green, and Red) editions are represented in table 5. The coefficients are between .84 and .98.

All three of these achievement tests were administered at both the St. Michael Tribal School and the Fort Totten Community School during the 1977-78 school year. The Metropolitan Readiness Test and the Boehm Test of Basic Concepts were administered during the month of April 1978. No preliminary treatment of the data was necessary as the machine-scored results included the composite test scores on all three instruments which were used in the data analysis in chapter IV.

The Pupil Information Report (appendix B) was used to collect all of the data, including the scores of the three achievement tests and the rest of the selected demographic variables as follows:

1. Achievement test scores (composite only)
2. Sex
3. Grade level
4. Age
5. Socioeconomic status
6. Home stability
7. Parental employment status

8. Degree of Indian blood
9. Tribal affiliation
10. Parental education
11. School attendance

TABLE 5

AVERAGE KR-20 RELIABILITIES

Test	Primary I	Primary II	Blue	Green	Red
READING					
Comprehension	-	-	.89	.93	.92
Vocabulary	-	-	.92	.92	.92
Reading Total	.90	.92	.95	.96	.96
LANGUAGE ARTS					
Usage	-	-	.92	.91	.91
Spelling	-	-	.89	.96	.88
Language Arts Total	.88	.90	.95	.94	.94
MATHEMATICS					
Concepts	-	-	.84	.86	.86
Computation	-	-	.89	.91	.93
Mathematics Total	.89	.91	.92	.94	.94
SOCIAL STUDIES	-	-	.89	.91	.93
SCIENCE	-	-	.88	.92	.89
USE OF SOURCES	-	-	.91	.93	.92
COMPOSITE	.95	.96	.98	.98	.98

SOURCE: Science Research Associates, Inc., Using Test Results: A Teacher's Guide (Chicago: Science Research Associates, Inc., 1972), p. 6.

This data was then coded according to the various categories described in chapter I. The writer found that it was impossible to collect all of the information for several reasons--incomplete school, agency, and tribal records, the Family Rights and Privacy Act; and a lack of

knowledge among the local community people regarding specific personal information on the individual pupils included in the study. Thus, out of a total of 317 pupils attending both schools during the 1977-78 school year, complete information was found on 302 pupils who were then included in the study.

Statistical Procedures

The statistical procedures included in this study consisted of the following: (1) analysis of variance, (2) correlation coefficients, and (3) the chi square test. The two-way analysis of variance technique was employed because the number of cases was disproportionate. While several different solutions to the disproportionality of cases are extant, the fitting constants solution was used. The fitting constants solution (Anderson and Bancroft 1952, Overall and Spiegel 1969, and Williams 1972) allows the assessment of the independent effect of each main effect in the presence of the other main effect. The chi square tests were used to compute mean scores for ten of the selected demographic variables. The Pearson r correlation coefficients were used on all of the selected demographic variables in relation to achievement test scores. Significant difference at the .05 and .01 levels was used in the evaluation of the results obtained.

CHAPTER IV

RESULTS AND ANALYSIS

The results and analysis of the present study are presented in the same order as were the research questions proposed in chapter I. These research questions were transformed into hypotheses stated in the null form.

Analysis of Variance and Correlation Coefficients of Achievement Test Scores in Relation to Previous Pupil Participation in an Early Childhood Education Program

The basic research question sought to determine whether participation in an early childhood education program on the Devils Lake Sioux Reservation was significantly related to academic achievement in kindergarten through the sixth grade. In addition, a list of ten selected demographic variables was included in this study in order to determine if they were significantly related to achievement test scores of pupils who had participated in an early childhood education program and to those pupils who had not participated in an early childhood education program.

Null Hypothesis 1

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, composite test scores were obtained from all three test instruments--the Metropolitan Readiness Test (MRT), the Boehm Test of Basic Concepts (BTBC), and the Science Research Associates Assessment Survey (SRA) for 110 pupils with no early childhood education participation (non-ECE) and for 192 pupils with kindergarten participation in an early childhood education (ECE) program. The kindergarten pupils attending the St. Michael Tribal School took the Metropolitan Readiness Test only; the first grade pupils attending the St. Michael Tribal School took the Boehm Test of Basic Concepts instrument only; the second through sixth grade pupils attending the St. Michael Tribal School took the Science Research Associates Assessment Survey test only; and the pupils attending the Fort Totten Community School took the Science Research Associates Assessment Survey test only during the 1977-78 school year. The kindergarten pupils attending the Fort Totten Community School did not take any standardized tests during the 1977-78 school year and were excluded from this study.

The means both for pupils with and without participation in an early childhood education program are presented in table 6. The analysis of variance for each of the achievement tests is represented in tables 7, 8, and 9. The results show that no significant differences were found for both pupil types on the Metropolitan Readiness Test and the Boehm Test of Basic Concepts instrument. Therefore, this part of the hypothesis was retained. However, on test scores of the Science Research Associates Assessment Survey, significant results were obtained between the two pupil groups at the .01 level (table 9). However, a word of caution should be made to the reader about drawing

TABLE 6

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM

Test	Grade Level	ECE N	ECE Mean Score	Non-ECE N	Non-ECE Mean Score	Both Groups N	Both Groups Mean Score
Metropolitan	K	31	60.90	10	58.90	41	60.41
BTBC	1	14	34.21	17	35.53	31	34.94
SRA	1-6	147	209.23	83	235.47	230	218.70
Total	K-6	192		110		302	

TABLE 7

ANALYSIS OF VARIANCE OF METROPOLITAN ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM

Source of Variation	df	SS	MS_w	F	p
Program	1	30.344	30.344	0.252	.618
Within	39	4695.602	120.400		
Total	40	4725.945			

TABLE 8

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM

Source of Variation	df	SS	MS_w	F	p
Program	1	13.279	13.279	0.223	.640
Within	29	1726.589	59.538		
Total	30	1739.868			

TABLE 9

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM

Source of Variation	df	SS	MS_w	F	p
Program	1	36521.480	36521.480	7.408	.007[a]
Within	228	1123974.000	4929.707		
Total	229	1160496.000			

[a]Significant at the .01 level

definite conclusions on this variable because, without question, the thirty-three non-early childhood education pupils in the sixth grade tend to skew the data as will be readily seen when examining table 16. Thus, the null hypothesis was rejected for this part of the hypothesis (table 9). Similar results on these three achievement test scores appear in the correlation coefficients which are presented in table 10. These results indicate no significant correlations were found on the

TABLE 10

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM

Test	Grade Level	N	r	p
Metropolitan	K	41	0.0801	.309
BTBC	1	31	-0.0874	.320
SRA	1-6	230	-0.1774	.003[a]
Total	K-6	302		

[a]Significant at the .01 level

Metropolitan Readiness Test and the Boehm Test of Basic Concepts test scores; however, significant negative correlations appear on the Science Research Associates Assessment Survey test, which would indicate that pupils without early childhood experience scored higher than did those with program participation.

Null Hypothesis 2

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when sex is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, early childhood education pupils and non-early childhood education pupils were separated by sex in relation to program participation or nonparticipation; and multiple regression techniques were employed to determine whether or not

statistically significant differences occurred between the mean scores of those groups.

The mean scores for both pupil types by sex are presented in table 11. These results show that both types of female pupils (early

TABLE 11

COMPARISON OF MEANS ON ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SEX

Test	Grade Level	Pupil Type	Female N	Female Mean Score	Male N	Male Mean Score	Total
Metropolitan	K	ECE	17	61.76	14	59.86	60.90
	K	NON-ECE	3	62.33	7	57.43	58.90
Total	K		20	61.85	21	59.05	60.41
BTBC	1	ECE	6	36.67	8	32.38	34.21
	1	NON-ECE	7	36.00	10	35.20	35.53
Total	1		13	36.31	18	33.94	34.94
SRA	1-6	ECE	67	223.45	80	197.32	209.23
	1-6	NON-ECE	46	244.89	37	223.76	235.47
Total	1-6		113	232.18	117	205.68	218.70

childhood and non-early childhood education) had higher mean scores than did both types of male pupils (early childhood and non-early childhood education) on all three achievement tests. The analysis of variance for achievement test scores by sex is presented in tables 12, 13, and 14. No significant differences were found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts between achievement test scores and the variable sex. The null hypothesis was retained for this part of the hypothesis. The analysis of variance done using the Science Research Associates Assessment Survey achievement test scores, based on the sex variable, revealed that significant

TABLE 12

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SEX

Source of Variation	df	SS	MS_w	F	p
Main Effects	2	93.984	46.992	0.377	.689
Program	1	13.535	13.535	0.108	.744
Sex	1	63.643	63.643	0.510	.480
Interaction	1	14.813	14.813	0.119	.732
Within	37	4617.137	124.787		
Total	40	4725.938			

TABLE 13

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SEX

Source of Variation	df	SS	MS_w	F	p
Main Effects	2	56.254	28.127	0.457	.638
Program	1	14.097	14.097	0.229	.636
Sex	1	42.975	42.975	0.699	.411
Interaction	1	22.809	22.809	0.371	.548
Within	27	1660.804	61.511		
Total	30	1739.867			

TABLE 14

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SEX

Source of Variation	df	SS	MS_w	F	p
Main Effects	2	70236.313	35118.156	7.282	.001
Program	1	29889.793	29889.793	6.198	.014
Sex	1	33714.840	33714.840	6.991	.009[a]
Interaction	1	326.563	326.563	0.068	.795
Within	226	1089927.000	4822.684		
Total	229	1160490.000			

[a]Significant at the .01 level

differences were found at the .01 level as both types of female pupils (early childhood education and non-early childhood education) scored significantly higher than did male pupils with or without early childhood program participation. Therefore, the null hypothesis was rejected for this part of the hypothesis.

The correlation coefficients are presented in table 15. Similarly, the results reveal that no significant correlations appeared on the Metropolitan Readiness Test or the Boehm Test of Basic Concepts; however, significant negative correlations were found on the Science Research Associates Assessment Survey test at the .01 level.

Null Hypothesis 3

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when grade level is considered as a

TABLE 15

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SEX

Test	Grade Level	N	r	p
Metropolitan	K	41	-0.1305	.208
BTBC	1	31	-0.1557	.202
SRA	1-6	230	-0.1865	.002[a]
Total	K-6	302		

[a]Significant at the .01 level

variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, both pupil types were separated for each grade level on all three test instruments; and then analysis of variance and correlation coefficient techniques were employed to determine if statistically significant differences existed when examining mean scores for this variable.

The means for these three test instruments are presented in table 16. With the exception of non-early childhood education first grade pupils who took the Boehm Test of Basic Concepts and non-early childhood education third grade pupils who took the Science Research Associates Assessment Survey, the early childhood education pupils had higher mean score averages on the scores computed for the remaining grade levels. As stated earlier, the analysis of variance and correlation coefficients for hypothesis one may be somewhat misleading, as there were thirty-three non-early childhood education pupils compared

TABLE 16

COMPARISON OF MEAN SCORES OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY GRADE LEVEL

Test	Grade Level	Pupil Type	N	Mean Score	Total
Metropolitan	K	ECE	31	60.90	
	K	NON-ECE	10	58.90	
Total	K	Both	41		60.41
BTBC	1	ECE	14	34.21	
	1	NON-ECE	17	35.53	
Total	1	Both	31		34.94
SRA	1	ECE	22	120.09	
	1	NON-ECE	3	89.00	
	1	Both	25		116.36
	2	ECE	32	182.56	
	2	NON-ECE	12	170.00	
	2	Both	44		179.14
	3	ECE	33	193.85	
	3	NON-ECE	11	200.55	
	3	Both			195.52
	4	ECE	24	230.17	
	4	NON-ECE	14	228.21	
	4	Both	38		299.45
	5	ECE	28	281.11	
	5	NON-ECE	10	257.80	
	5	Both	38		274.97
	6	ECE	8	310.13	
	6	NON-ECE	33	280.55	
	6	Both	41		286.32
Total	1-6	ECE	147	209.23	
	1-6	NON-ECE	83	235.47	
	1-6	Both	230		218.70

with only eight early childhood education pupils enrolled in the sixth grade for the 1977-78 school year. Even though, overall, the non-early childhood education pupils had a higher mean (235.47 to 209.23) than the early childhood education pupils, the comparisons between grade levels lend little credence to a conclusion of lower functioning by early childhood education pupils. At five of the six grade levels, the early childhood education pupils had higher means. Only non-early childhood education third graders exceed the mean scores of the early childhood education pupils. The mean score findings for this hypothesis are important because they tend to put the study into proper perspective so that the reader does not take previous and later hypothesis findings out of context, even though non-early childhood education pupils scored higher than early childhood education pupils on the Science Research Associates Assessment Survey instrument at the .01 level.

There were no analysis of variance or correlation coefficients calculated on the Metropolitan Readiness Test scores and Boehm Test of Basic Concepts scores as those tests were only taken by the kindergarten and first grade pupils, respectively. Thus, tests for significant differences between grade levels could not be computed using those techniques. Table 17 presents the analysis of variance findings for first through sixth grade pupils who took the Science Research Associates Assessment Survey instrument. The results reveal that significant differences were found at the .01 level between pupil types when grade level was considered as a variable. Therefore, the null hypothesis was rejected.

TABLE 17

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY GRADE LEVEL

Source of Variation	df	SS	MS_w	F	p
Main Effects	6	672823.375	112137.188	50.929	.000
Program	1	6297.594	6297.594	2.860	.092
Grade Level	5	636301.875	127260.375	57.797	.000[a]
Interaction	5	7671.688	1534.337	0.697	.626
Within	218	479994.938	2201.812		
Total	229	1160490.000			

[a]Significant at the .01 level

The correlation coefficients were omitted for the Metropolitan Readiness Test and the Boehm Test of Basic Concepts because there was a lack of sufficient comparative data. The findings from the analysis of the Science Research Associates Assessment Survey instrument test scores among grade levels reveal significant differences between the pupil groups at the .01 level (table 18). The correlation coefficients reveal significant findings at the .01 level on the Science Research Associates Assessment Survey instrument as well. Thus, the null hypothesis was rejected for this part of the hypothesis.

Null Hypothesis 4

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when age is considered as a variable. The results were obtained from the Pupil Information Report during the

TABLE 18

CORRELATION COEFFICIENTS OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY GRADE LEVEL

Test	Grade Level	N	r	p
SRA	1-6	230	0.7439	.000[a]
Total	K-6	302		

[a]Significant at the .01 level

1977-78 school year.

In order to test this hypothesis, correlation coefficients were used to determine if age was significantly related to academic achievement on all three instruments (table 19). The results reveal significant correlations were found between achievement test scores and age

TABLE 19

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY AGE

Test	Grade Level	N	r	p
Metropolitan	K	41	-0.0699	.332
BTBC	1	31	-0.1492	.211
SRA	1-6	230	0.6496	.000[a]
Total	K-6	302		

[a]Significant at the .01 level

for both pupil types on the Science Research Associates Assessment Survey instrument. Therefore, the null hypothesis was rejected for this part of the hypothesis. There were no significant differences on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. Therefore, the null hypothesis was retained for this part of the hypothesis.

Null Hypothesis 5

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when socioeconomic status is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, both pupil types were separated into three categories: (1) low socioeconomic status, (2) middle socioeconomic status, and (3) high socioeconomic status. Then analysis of variance and correlation coefficient techniques were employed to find significant differences among the socioeconomic levels for both pupil types using the test scores. Their means are presented in table 20.

Tables 21 and 22 present the results for the Metropolitan Readiness Test and Boehm Test of Basic Concepts instruments and their relation to participation in an early childhood program by socioeconomic status for both pupil types. Since no significant findings were obtained on these instruments, the null hypothesis was retained for this part of the hypothesis.

TABLE 20

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SOCIOECONOMIC STATUS

Test	Grade Level	Pupil Type	N	Low SES	N	Middle SES	N	High SES	Total
MRT	K	ECE	16	61.38	13	62.15	2	49.00	60.90
	K	NON-ECE	3	46.00	5	59.80	2	76.00	58.90
Total	K	Both	19	58.95	18	61.50	4	62.50	60.41
BTBC	1	ECE	6	38.67	3	29.67	5	31.60	34.21
	1	NON-ECE	12	35.08	3	31.67	2	44.00	35.14
Total	1	Both	18	36.28	6	30.67	7	35.14	34.94
SRA	1-6	ECE	45	222.71	61	189.89	41	223.22	209.23
	1-6	NON-ECE	31	223.32	33	235.39	19	255.42	235.47
Total	1-6	Both	76	222.96	94	205.86	60	233.42	218.70

TABLE 21

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SOCIOECONOMIC STATUS

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	137.480	45.827	0.486	.694
Program	1	57.976	57.976	0.615	.438
SES	2	107.138	53.569	0.568	.572
Interaction	2	1288.219	644.109	6.831	.003
Within	5	3300.239	94.293		
Total	35	4725.938			

TABLE 22

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SOCIOECONOMIC STATUS

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	147.946	49.315	0.933	.439
Program	1	5.877	5.877	0.111	.742
SES	2	134.667	67.334	1.275	.297
Interaction	2	271.142	135.571	2.566	.097
Within	25	1320.779	52.831		
Total	30	1739.867			

Table 23 presents the findings of the Science Research Associates Assessment Survey on the socioeconomic status variable. The results reveal that significant differences were found at the .05 level on the socioeconomic status variable, which may be attributed to higher mean scores by non-early childhood education pupils and early childhood education pupils at both the middle and higher socioeconomic status (SES) levels on this hypothesis. Therefore, the null hypothesis was rejected for this part of the hypothesis.

Table 24 presents the correlation coefficients for all three of the achievement tests and the results reveal no significant correlations between achievement test scores and socioeconomic status for both pupil types. Therefore, the null hypothesis was retained for this part of the hypothesis.

TABLE 23

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SOCIOECONOMIC STATUS

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	67227.250	22409.082	4.679	.003
Program	1	37359.637	37359.637	7.801	.006
SES	2	30705.781	15352.891	3.206	.042[a]
Interaction	2	20461.188	10230.594	2.136	.121
Within	224	1072801.000	4789.289		
Total	229	1160490.000			

[a]Significant at the .05 level

TABLE 24

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SOCIOECONOMIC STATUS

Test	Grade Level	N	r	p
Metropolitan	K	41	-0.1259	.216
BTBC	1	31	0.1185	.263
SRA	1-6	230	-0.0447	.250
Total	K-6	302		

Null Hypothesis 6

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when home stability is considered as a variable. The results were obtained from the Pupil Information Report

during the 1977-78 school year.

In order to test this hypothesis, the pupils were separated into five categories: (1) living with both parents, (2) living with father only, (3) living with mother only, (4) living with relatives, or (5) living with guardians. Multiple regression techniques were employed to find if significant differences existed between both pupil types on their achievement test scores when considering home stability factors.

Table 25 presents the mean scores for both pupil types according to the various home stability factors involved. Particular attention should be paid to both pupil types who are living with either both parents or the mother only. It appears that there are not enough samples in the population to draw from for the father only, relatives, and guardians, respectively, for the specific test being conducted. Of particular interest would be the Science Research Associates Assessment Survey. The only category in which the early childhood education pupils had a higher mean score average than did the non-early childhood education pupils was with guardians.

Tables 26, 27, and 28 represent the analysis of variance of the respective achievement test scores of both pupil types by home stability. Significant differences were found on the Metropolitan Readiness Test and the Science Research Associates Assessment Survey instruments for this particular variable. On the Metropolitan Readiness Test these differences were found at the .01 level, as the early childhood education pupils scored much higher than did non-early childhood education pupils in the living with mother only category. On the Science Research Associates Assessment Survey, non-early childhood

TABLE 25

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY HOME STABILITY

				Mean Scores: Pupil living with								
Test	Grade Level	Pupil Type	N	Both Parents	N	Father Only	N	Mother Only	N	Guar-dians	N	Rela-tives	Total
Metropolitan												
	K	ECE	8	64.07	0		14	58.21	0	55.00	0	57.00	60.90
	K	NON-ECE	15	64.25	0		2	37.50	1		1		58.90
Total	K	Both	23	64.13	0		16	55.63	1	55.00	1	57.00	60.41
BTBC													
	1	ECE	11	33.27	0		1	32.00	0		2	40.50	34.21
	1	NON-ECE	7	37.29	0		8	34.38	0		2	34.00	35.53
Total	1	Both	18	34.83	0		9	34.11	0		4	37.25	34.94
SRA													
	1-6	ECE	88	216.91	2	260.00	44	192.25	4	217.25	9	202.33	209.23
	1-6	NON-ECE	43	253.47	2	290.00	27	212.22	3	187.33	8	221.63	235.47
Total	1-6	Both	131	228.91	4	275.00	71	199.85	7	204.43	17	211.41	218.70

TABLE 26

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY HOME STABILITY

Source of Variation	df	SS	MS_w	F	p
Main Effects	4	904.372	226.093	2.435	.065
Program	1	178.780	178.780	3.138	.174
Home Stability	3	874.031	291.344	1.926	.038[a]
Interaction	1	572.289	572.289	6.164	.018
Within	35	3249.277	92.836		
Total	40	4725.938			

[a]Significant at the .05 level

TABLE 27

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY HOME STABILITY

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	54.209	18.070	0.283	.837
Program	1	26.476	26.476	0.415	.525
Home Stability	2	40.930	20.465	0.321	.729
Interaction	2	89.677	44.839	0.702	.505
Within	25	1595.981	63.839		
Total	30	1739.867			

TABLE 28

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY HOME STABILITY

Source of Variation	df	SS	MS_w	F	p
Main Effects	5	93926.375	18785.273	3.909	.002
Program	1	40026.105	40026.105	8.328	.004
Home Stability	4	57404.895	14351.112	2.985	.020[a]
Interaction	4	9259.688	2314.922	0.482	.749
Within	220	1057303.000	4805.922		
Total	229	1160490.000			

[a]Significant at the .05 level

education pupils scored significantly higher in the both parents, father only, mother only, and relatives categories than did the early childhood education pupils. Differences found were significant at the .05 level. Therefore, the null hypothesis was rejected for this part of the hypothesis. The null hypothesis was retained for both pupil types on the Boehm Test of Basic Concepts instrument, as no statistically significant differences were found between the two groups.

The correlation coefficients between achievement test scores when home stability is a variable are presented in table 29. The null hypothesis was retained for the Boehm Test of Basic Concepts instrument but rejected for both the Metropolitan Readiness Test and the Science Research Associates Assessment Survey as significant negative correlations were found at the .01 level.

TABLE 29

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY HOME STABILITY

Test	Grade Level	N	r	p
Metropolitan	K	41	-0.3698	.009[a]
BTBC	1	31	0.0672	.360
SRA	1-6	230	-0.1541	.010[a]
Total	K-6	302		

[a]Significant at the .01 level

Null Hypothesis 7

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when parental employment status is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, pupils were separated into three categories according to the employment status of their parents, relatives, or guardians as follows: (1) fully employed, (2) part-time employed, or (3) unemployed during the 1977-78 school year. The analysis of variance and correlation coefficient techniques were then employed on both pupil types' achievement test scores and the variable parental employment status for significance.

The comparison of means of achievement test scores of both pupil types by parental employment status is presented in table 30. Tables 31, 32, and 33 represent the analysis of variance for all three

TABLE 30

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EMPLOYMENT STATUS

Test	Grade Level	Pupil Type	N	Mean Scores: Parents, Relatives, or Guardians: Fully Employed	N	Part-time Employed	N	Unemployed	Total
Metropolitan									
	K	ECE	13	58.62	3	63.67	14	61.57	60.50
	K	NON-ECE	6	65.53	1	59.00	3	46.00	58.90
Total	K	Both	19	60.74	4	62.50	17	58.82	60.10
BTBC									
	1	ECE	8	30.88	0	00.00	6	38.67	34.21
	1	NON-ECE	5	36.60	2	34.50	10	35.20	35.53
Total	1	Both	13	33.08	2	34.50	16	36.50	34.94
SRA									
	1-6	ECE	75	221.65	10	192.80	62	196.85	209.23
	1-6	NON-ECE	37	243.70	10	255.80	36	221.36	235.47
Total	1-6	Both	112	228.94	20	224.30	98	205.86	218.70

TABLE 31

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EMPLOYMENT STATUS

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	86.718	28.906	0.265	.850
Program	1	28.272	28.272	0.259	.614
Employment	2	67.518	33.759	0.310	.736
Interaction	2	772.376	386.188	3.544	.040
Within	34	3704.492	108.956		
Total	39	4563.586			

TABLE 32

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EMPLOYMENT STATUS

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	87.568	29.189	0.503	.684
Program	1	3.120	3.120	0.054	.818
Employment	2	74.290	37.145	0.640	.536
Interaction	1	142.795	142.795	2.460	.129
Within	26	1509.504	58.058		
Total	30	1739.867			

TABLE 33

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EMPLOYMENT STATUS

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	66869.438	22289.813	4.596	.004
Program	1	38339.961	38339.961	7.905	.005
Employment	2	30348.012	15174.004	3.129	.046[a]
Interaction	2	7228.875	3614.438	0.745	.476
Within	224	1086391.000	4849.957		
Total	229	1160490.000			

[a]Significant at the .05 level

test instruments. Table 34 presents the correlations of all three tests when parental employment status is the variable.

TABLE 34

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EMPLOYMENT STATUS

Test	Grade Level	N	r	p
Metropolitan	K	41	-0.0835	.304
BTBC	1	31	0.2201	.117
SRA	1-6	230	-0.1544	.010[a]
Total	K-6	302		

[a]Significant at the .01 level

The data presented on the Metropolitan Readiness Test (table 31) and the Boehm Test of Basic Concepts (table 32) reveal no significant differences for both pupil types on these instruments. Therefore, the null hypothesis was retained for this part of the hypothesis. However, significant differences were obtained at the .05 level on the Science Research Associates Assessment Survey when parental employment status was the variable; therefore, the null hypothesis was rejected for this part of the hypothesis (table 33).

The correlations presented in table 34 indicate that significant negative correlations were found at the .01 level on the Science Research Associates Assessment Survey test; therefore, the null hypothesis was rejected for this part of the hypothesis. No significant correlations were found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. Therefore, the null hypothesis was retained for this part of the hypothesis. However, it may be worthy to note that the mean scores on the Science Research Associates Assessment Survey test of the non-early childhood education pupils were notably higher than the early childhood education pupils in the part-time employed category by sixty-three points, in the fully employed category by slightly more than twenty-four points, and in the unemployed category by slightly more than twenty-two points (table 30).

Null Hypothesis 8

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when degree of Indian blood is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, both pupil types were separated by degree of Indian blood in the following categories: (1) non-Indian, (2) less than one-fourth, (3) one-fourth to one-half, (4) one-half to three-fourths, (5) three-fourths to seven-eighths, or (6) full. Multiple regression techniques were employed to test significant differences in the achievement test scores for both pupil types by degree of Indian blood.

Table 35 presents the comparison of mean scores between both pupil types. Tables 36, 37, and 38 present the analysis of variance for the scores of all three tests. There were no significant findings on the Metropolitan Readiness Test, Boehm Test of Basic Concepts, or Science Research Associates Assessment Survey test scores; therefore, the null hypothesis was retained for this part of the hypothesis. The data presented in table 39 reveals that significant negative correlations were found at the .01 level on the Metropolitan Readiness Test instrument; therefore, the null hypothesis was rejected for this part of the hypothesis. There were no significant correlations on either the Boehm Test of Basic Concepts or Science Research Associates Assessment Survey scores; thus, the null hypothesis was retained for this part of the hypothesis.

Null Hypothesis 9

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when tribal affiliation is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

TABLE 35

COMPARISON OF MEAN SCORES OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY DEGREE OF INDIAN BLOOD

				Mean Scores: Degree of Indian Blood									
Test	Grade Level	Pupil Type	N	Non-Indian	N	Less 1/4	N	1/4-1/2	N	1/2-3/4	N	3/4-7/8	N	Full	Total
MRT															
	K	ECE	2	79.50	2	63.00	6	63.83	10	58.10	5	59.80	6	56.67	60.90
	K	NON-ECE	3	63.67	1	61.00	1	71.00	0	00.00	1	54.00	4	53.00	58.90
Total	K	Both	5	70.00	3	62.33	7	64.86	10	58.10	6	58.83	10	55.20	60.41
BTBC															
	1	ECE	0	00.00	2	40.00	2	40.50	2	28.00	1	35.00	7	32.67	34.21
	1	NON-ECE	1	47.00	0	00.00	0	00.00	3	32.67	1	31.00	12	35.67	35.53
Total	1	Both	1	00.00	2	40.00	2	40.50	5	30.80	2	33.00	19	34.47	34.94
SRA															
	1-6	ECE	0	000.00	2	211.50	9	218.11	31	211.10	12	232.00	93	204.76	209.23
	1-6	NON-ECE	3	236.33	0	000.00	8	242.50	12	238.42	9	265.67	51	228.29	235.47
Total	1-6	Both	3	236.33	2	211.50	17	229.59	43	218.72	21	246.43	144	213.10	218.70

TABLE 36

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY DEGREE OF INDIAN BLOOD

Source of Variation	df	SS	MS_w	F	p
Main Effects	6	1079.049	179.841	1.601	.181
Program	1	129.955	129.955	1.157	.291
INDBL	5	1048.707	209.741	1.868	.130
Interaction	4	277.866	69.467	0.619	.653
Within	30	3369.023	112.301		
Total	40	4725.938			

TABLE 37

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY DEGREE OF INDIAN BLOOD

Source of Variation	df	SS	MS	F	p
Main Effects	6	408.272	68.045	1.148	.368
Program	1	52.438	52.438	0.885	.357
INDBL	5	394.993	78.999	1.333	.287
Interaction	2	28.051	14.026	0.237	.791
Within	22	1303.544	59.252		
Total	30	1739.867			

TABLE 38

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY DEGREE OF INDIAN BLOOD

Source of Variation	df	SS	MS_w	F	p
Main Effects	6	56259.355	9376.559	1.869	.087
Program	1	32540.777	32540.777	6.486	.012
INDBL	5	19737.871	3947.574	0.787	.560
Interaction	3	501.879	167.293	0.033	.992
Within	220	1103728.000	5016.945		
Total	229	1160490.000			

TABLE 39

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY DEGREE OF INDIAN BLOOD

Test	Grade Level	N	r	p
Metropolitan	K	41	-0.4165	.003[a]
BTBC	1	31	-0.2626	.077
SRA	1-6	230	-0.0709	.142
Total	K-6	302		

[a]Significant at the .01 level

In order to test this hypothesis, both pupil types were separated by tribal affiliation into the following categories: (1) Devils Lake Sioux, (2) Turtle Mountain Chippewa, (3) other tribes, or (4) non-Indian. As previously mentioned, there were only nine non-Indians included in the study (less than 3 percent); and the rest of the demographic breakdown by tribal affiliation was as follows: (1) 260 Devils Lake Sioux, (2) twenty Turtle Mountain Chippewa, and (3) thirteen pupils from other tribes. Multiple regression techniques were employed for each of the standardized tests to determine levels of significance for both pupil types.

The data presented in table 40 represent the mean scores for both pupil types on all three test instruments for the variable tribal affiliation. Tables 41, 42, and 43 present the analysis of variance degrees of freedom, sum of squares, mean squares, F, and probability values of achievement test scores for both pupil types by tribal affiliation. Table 44 presents the correlations between achievement test scores and tribal affiliation variables for both pupil types.

The analysis of variance conducted for this variable reveals that no significant differences exist between achievement test scores and tribal affiliation for both pupil types. Therefore, the null hypothesis was retained for this part of the hypothesis.

The data presented in table 44 reveal that significant negative correlations were found at the .05 level for the Devils Lake Sioux on the Boehm Test of Basic Concepts, for the non-Indian on the Metropolitan Readiness Test, and for the Turtle Mountain Chippewa on the Science Research Associates Assessment Survey instruments; thus, the null hypothesis was rejected for this part of the hypothesis.

TABLE 40

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY TRIBAL AFFILIATION

			Tribal Affiliation									
			D.L. Sioux		T.M. Chip		Other Tribes		Non-Indian		Total Groups	
Test	Grade Level	Pupil Type	N	Mean Score	N	Mean Score	N	Mean Score	N	Mean Score	N	Mean Score
MRT												
	K	ECE	25	59.48	4	60.50	0	00.00	2	79.50	31	60.90
	K	NON-ECE	6	56.17	1	61.00	0	00.00	3	63.67	10	58.90
	K	Both Groups	31	58.84	5	60.60	0	00.00	5	70.00	41	60.41
BTBC												
	1	ECE	10	31.80	2	40.00	2	40.50	0	00.00	14	34.21
	1	NON-ECE	15	34.87	0	00.00	1	34.00	1	47.00	17	35.53
	1	Both Groups	25	33.64	2	40.00	3	38.33	1	47.00	31	34.94
SRA												
	1-6	ECE	131	209.91	10	192.60	6	222.17	0	000.00	147	209.23
	1-6	NON-ECE	73	239.96	3	151.33	4	216.00	3	236.33	83	235.47
	1-6	Both Groups	204	220.66	13	183.08	10	219.70	3	236.33	230	218.70

TABLE 41

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY TRIBAL AFFILIATION

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	711.940	237.313	2.166	.110
Program	1	175.383	175.383	1.601	.214
Tribe	2	681.599	340.799	3.110	.057
Interaction	2	178.771	89.385	0.816	.451
Within	35	3835.226	109.578		
Total	40	4725.938			

TABLE 42

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY TRIBAL AFFILIATION

Source of Variation	df	SS	MS_w	F	p
Main Effects	4	303.125	75.781	1.371	.272
Program	1	29.681	29.681	0.537	.471
Tribe	3	289.846	96.615	1.748	.183
Interaction	1	54.913	54.913	0.993	.328
Within	25	1381.829	55.273		
Total	30	1739.867			

TABLE 43

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY TRIBAL AFFILIATION

Source of Variation	df	SS	MS_w	F	p
Main Effects	4	50918.828	12729.707	2.590	.038
Program	1	32693.875	32693.875	6.653	.011
Tribe	3	14397.344	4799.113	0.977	.405
Interaction	2	13659.113	6829.555	1.390	.251
Within	223	1095912.000	4914.402		
Total	229	1160490.000			

TABLE 44

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY TRIBAL AFFILIATION

Test	Grade Level	Tribal Affiliation	N	r	p
MRT	K	Devils Lake Sioux	31	-0.2584	.051
MRT	K	Turtle Mt Chippewa	5	0.0064	.484
MRT	K	Other	0	99.0000	--
MRT	K	Non-Indian	5	-0.3327	.017[a]
BTBC	1	Devils Lake Sioux	25	-0.3530	.026[a]
BTBC	1	Turtle Mt Chippewa	2	0.1775	.170
BTBC	1	Other	3	0.1485	.213
BTBC	1	Non-Indian	1	-0.2940	.054
SRA	1-6	Devils Lake Sioux	204	0.0774	.121
SRA	1-6	Turtle Mt Chippewa	13	-0.1227	.032[a]
SRA	1-6	Other	10	0.0030	.482
SRA	1-6	Non-Indian	3	-0.0285	.333
Total	K-6		302		

[a]Significant at the .05 level

No significant differences were found for the Turtle Mountain Chippewa on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts, for the pupils from other tribes on all three test instruments, the Devils Lake Sioux on the Metropolitan Readiness Test and Science Research Associates Assessment Survey, and the non-Indians on the Science Research Associates Assessment Survey and the Boehm Test of Basic Concepts; thus, the null hypothesis was retained for this part of the hypothesis.

Null Hypothesis 10

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when parental education is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, the test scores of both pupil types were separated into five parental education categories: (1) non-high school graduate, (2) high school graduate, (3) some college, (4) college graduate, or (5) master's degree or above. Because of adequate sample size, only the test scores of the father and mother were considered for this hypothesis. In other words, the guardians (male and female) and the relatives (male and female) were excluded from the hypothesis as less than a 10 percent sample size could be drawn from their population; thus, no conclusions could be drawn from that data.

The data in tables 45 and 46 represent the mean scores for the parental education of the father and mother, respectively. The analysis of variance test for the father is presented in tables 47, 48,

TABLE 45

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF FATHER

			Mean Scores: Parental Education of Father									
Test	Grade Level	Pupil Type	N	Non-HS Graduate	N	HS Graduate	N	Some College	N	College Graduate	N	M.A. or Above	Total
MRT													
	K	ECE	10	65.40	4	55.25	0	00.00	0	00.00	0	00.00	62.50
	K	NON-ECE	4	61.50	2	67.50	1	71.00	0	00.00	0	00.00	63.19
Total	K	Both	14	64.29	6	59.33	1	71.00	0	00.00	0	00.00	63.19
BTBC													
	1	ECE	5	36.40	6	30.67	0	00.00	0	00.00	0	00.00	33.27
	1	NON-ECE	3	37.33	3	36.00	0	00.00	0	00.00	0	00.00	37.29
Total	1	Both	8	36.75	9	32.44	0	00.00	0	00.00	0	00.00	34.83
SRA													
	1-6	ECE	25	200.18	19	243.09	1	220.26	0	256.00	0	000.00	217.87
	1-6	NON-ECE	44	250.96	23	247.63	19	333.00	4	000.00	0	000.00	251.38
Total	1-6	Both	69	218.58	42	245.14	20	225.90	4	256.00	0	000.00	229.04

TABLE 46

COMPARISON OF MEANS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF MOTHER

			Mean Scores: Parental Education of Mother									
Test	Grade Level	Pupil Type	N	Non-HS Graduate	N	HS Graduate	N	Some College	N	College Graduate	N	M.A. or Above	Total
MRT													
	K	ECE	19	59.26	6	62.00	2	59.50	0	00.00	0	00.00	59.89
	K	NON-ECE	5	52.00	2	57.50	1	71.00	1	81.00	0	00.00	58.56
Total	K	Both	24	57.75	8	60.88	3	63.33	1	81.00	0	00.00	59.56
BTBC													
	1	ECE	8	34.38	2	40.00	1	24.00	1	19.00	0	00.00	33.17
	1	NON-ECE	11	35.18	4	37.25	0	00.00	0	00.00	0	00.00	35.73
Total	1	Both	19	34.84	6	38.17	1	24.00	1	19.00	0	00.00	34.59
SRA													
	1-6	ECE	82	192.26	43	235.77	7	234.86	0	000.00	0	000.00	208.69
	1-6	NON-ECE	45	225.18	22	255.27	2	301.50	1	277.00	0	000.00	237.56
Total	1-6	Both	127	203.92	65	242.37	9	249.67	1	277.00	0	000.00	218.69

TABLE 47

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF FATHER

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	173.477	57.826	0.803	.510
Program	1	6.429	6.429	0.089	.769
EDFATH	2	153.453	76.726	1.065	.368
Interaction	1	237.111	237.111	3.291	.088
Within	16	1152.648	72.041		
Total	20	1563.236			

TABLE 48

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF FATHER

Source of Variation	df	SS	MS_w	F	p
Main Effects	3	158.564	52.855	0.657	.593
Program	1	39.787	39.787	0.495	.494
EDFATH	2	89.675	44.837	0.558	.586
Interaction	1	18.735	18.735	0.233	.637
Within	13	1045.198	80.400		
Total	17	1222.499			

and 49. The analysis of variance test results for the mother are presented in tables 51, 52, and 53. The correlation coefficients for the father are presented in table 50 and for the mother in table 54.

TABLE 49

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF FATHER

Source of Variation	df	SS	MS_W	F	p
Main Effects	4	55581.656	13895.414	2.942	.023
Program	1	34036.586	34036.586	7.206	.008
EDFATH	3	21891.820	7297.273	1.545	.206
Interaction	2	19357.719	9678.859	2.049	.133
Within	128	604604.250	4723.469		
Total	134	679543.625			

TABLE 50

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF FATHER

Test	Grade Level	N	r	p
Metropolitan	K	21	-0.0722	.378
BTBC	1	31	-0.1046	.340
SRA	1-6	135	0.1103	.101
Total	K-6	302		

TABLE 51

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF MOTHER

Source of Variation	df	SS	MS_w	F	p
Main Effects	4	721.328	180.332	1.791	.158
Program	1	126.481	126.481	1.256	.272
EDMOTH	3	709.328	236.443	2.348	.093
Interaction	2	200.876	100.438	0.997	.381
Within	29	2920.681	100.713		
Total	35	3842.885			

TABLE 52

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF MOTHER

Source of Variation	df	SS	MS_w	F	p
Main Effects	4	433.160	108.290	1.917	.145
Program	1	0.001	0.001	0.000	.997
EDMOTH	3	389.241	129.747	2.297	.107
Interaction	1	13.097	13.097	0.232	.635
Within	21	1186.259	56.488		
Total	26	1632.516			

TABLE 53

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF MOTHER

Source of Variation	df	SS	MS_w	F	p
Main Effects	4	116182.375	29045.594	6.081	.000
Program	1	39999.773	39999.773	8.374	.004
EDMOTH	3	78062.938	26020.977	5.447	.001[a]
Interaction	2	3937.000	1968.500	0.412	.663
Within	195	931466.625	4776.750		
Total	201	1051586.000			

[a]Significant at the .01 level

TABLE 54

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY PARENTAL EDUCATION OF MOTHER

Test	Grade Level	N	r	p
Metropolitan	K	36	0.3436	.020[a]
BTBC	1	27	-0.3022	.063
SRA	1-6	202	0.2586	.000[b]
Total	K-6	302		

[a]Significant at the .05 level

[b]Significant at the .01 level

There were 174 fathers (table 45) and 265 mothers (table 46) included in this portion of the study. There were three guardian males, six guardian females, nineteen relative males, and twenty-two relative females who were excluded from the study.

The analysis of variance on the parental education of the father for each of the three achievement tests reveals no significance between both pupil types. Therefore, the null hypothesis was retained for this part of the hypothesis. There were no significant correlations (table 50) for each of the three test instruments by the parental education of the father variables; thus, this part of the hypothesis was retained as well.

The data presented in tables 51 and 52 for the analysis of variance on the Metropolitan Readiness Test and Boehm Test of Basic Concepts instruments reveal no significant findings on the parental education of the mother; therefore, the null hypothesis was retained for this part of the hypothesis. However, there were significant findings on the Science Research Associates Assessment Survey instrument at the .01 level (table 53); thus, the null hypothesis was rejected for this part of the hypothesis.

The correlation coefficients on the scores from the Metropolitan Readiness Test revealed a significant difference at the .05 level, and on the Science Research Associates Assessment Survey significant findings occurred at the .01 level and are presented in table 54; thus, the null hypothesis was rejected for this part of the hypothesis. There were no significant correlations on the Boehm Test of Basic Concepts instrument for this variable; therefore, the null hypothesis was retained for this part of the hypothesis.

Null Hypothesis 11

There will be no significant difference between academic achievement test scores of early childhood education pupils and non-early childhood education pupils when school attendance is considered as a variable. The results were obtained from the Pupil Information Report during the 1977-78 school year.

In order to test this hypothesis, analysis of variance techniques were employed to determine significant differences between both pupil groups and school attendance. Likewise, correlation coefficient techniques were employed to determine significant relationships between achievement test scores and school attendance.

The means of both pupil types by grade level are presented in table 55. The analysis of variance for the total number of pupils in the study is shown in table 56. The analysis of covariance (school attendance and grade level) is presented in tables 57, 58, and 59 for the three test instruments. The correlation coefficients between achievement test scores and school attendance for both pupil types are presented in table 60.

There were no significant differences found on the analysis of variance of achievement test scores and school attendance for all three test instruments (table 56); therefore, the null hypothesis was retained for this part of the hypothesis. Tables 57, 58, and 59 present the results for each test instrument on the variable school attendance. Accordingly, no significant differences on these three test instruments appear at the .05 level; therefore, the null hypothesis was retained for this part of the hypothesis.

TABLE 55

COMPARISON OF MEANS OF TOTAL ACHIEVEMENT TEST SCORES BY GRADE LEVEL IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SCHOOL ATTENDANCE

Grade Level	N	Days Absent ECE Mean Score	N	Days Absent Non-ECE Mean Score	N	Total
K	31	16.26	10	16.00	41	16.20
1	36	14.44	20	16.20	56	15.07
2	32	11.53	12	15.27	44	12.52
3	33	12.58	11	15.27	44	13.25
4	24	9.79	14	15.14	38	11.76
5	28	8.43	10	13.00	38	9.63
6	8	11.25	33	16.70	41	15.63
Total 1-6	192	12.34	110	15.70	302	13.56

TABLE 56

ANALYSIS OF VARIANCE OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SCHOOL ATTENDANCE PER GRADE LEVEL

Source of Variation	df	SS	MS_w	F	p
Main Effects	7	1955.169	279.310	1.945	.063
Program	1	605.467	604.467	4.216	.041
Grade	6	1164.959	194.160	1.352	.234
Interaction	6	208.235	34.706	0.242	.962
Within	288	41358.340	143.605		
Total	301	43521.746			

TABLE 57

ANALYSIS OF VARIANCE OF METROPOLITAN READINESS TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SCHOOL ATTENDANCE

Source of Variation	df	SS	MS_w	F	p
Covariates	1	7.691	7.691	0.062	.804
Absent	1	7.691	7.691	0.062	.804
Main Effects	1	30.045	30.045	0.244	.625
Program	1	30.045	30.045	0.244	.625
Within	38	4688.207	123.374		
Total	40	4725.945			

Covariate	Raw Regression Coefficient
Absent	0.038

TABLE 58

ANALYSIS OF VARIANCE OF BOEHM ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SCHOOL ATTENDANCE

Source of Variation	df	SS	MS_w	F	p
Covariates	1	8.280	8.280	0.135	.716
Absent	1	8.280	8.280	0.135	.716
Main Effects	1	10.001	10.001	0.163	.690
Program	2	10.001	10.001	0.163	.690
Within	28	1721.586	61.485		
Total	30	1739.867			

Covariate	Raw Regression Coefficient
Absent	0.033

TABLE 59

ANALYSIS OF VARIANCE OF SRA ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SCHOOL ATTENDANCE

Source of Variation	df	SS	MS_w	F	p
Covariates	1	6095.773	6095.773	1.244	.266
Absent	1	6095.773	6095.773	1.244	.266
Main Effects	1	42438.875	42438.875	8.664	.004
Program	1	42438.875	42438.875	8.664	.004
Within	227	1111955.000	4898.477		
Total	229	1160490.000			

Covariate	Raw Regression Coefficient
Absent	-0.447

TABLE 60

CORRELATION COEFFICIENTS OF ACHIEVEMENT TEST SCORES IN RELATION TO PARTICIPATION OR NONPARTICIPATION IN AN EARLY CHILDHOOD EDUCATION PROGRAM BY SCHOOL ATTENDANCE

Test	Grade Level	N	r	p
Metropolitan	K	41	0.0403	.401
BTBC	1	31	0.0690	.356
SRA	1-6	230	-0.0725	.137
Total	K-6	302		

The correlations presented in table 60 reveal no significant differences for all three test instruments; therefore, the null hypothesis was retained for this part of the hypothesis.

Chapter IV analyzed the results obtained from the present investigation. Chapter V presents the summary, conclusions, and recommendations for this study.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the significant differences between academic achievement test scores of early childhood education pupils and non-early childhood education pupils on eleven variables including academic achievement, sex, grade level, age, socioeconomic status, home stability, parental employment status, degree of Indian blood, tribal affiliation, parental education, and school attendance. Previous research on the success of early childhood education programs had indicated mixed feelings; however, recent research on Head Start programs revealed significant gains in academic achievement test scores for the majority of children enrolled in such programs (Mann 1977). But, as noted in the review of related literature, very little research has been done on this topic in the Indian community.

The subjects used in this study were 192 pupils who had participated in an early childhood education program (ECE) and 110 pupils who had not participated in an early childhood education program (non-ECE). All of these pupils were enrolled in predominantly Indian schools, attending either the St. Michael Tribal School or the Fort Totten Community School on the Devils Lake Sioux Reservation during the 1977-78 school year.

All of the pupils had taken at least one standardized test during March or April of 1978. Their composite test scores, along with the rest of the selected demographic variables mentioned, were collected during the period from July 1978 until September 1979. Out of a total enrollment of 317 pupils, complete information was obtained on 302 pupils who were then included in this study.

The statistics which were employed in this study consisted of the analysis of variance, Pearson r correlation coefficient, and chi square test. The .05 level of significance was used for evaluating the results obtained.

A summary of findings from this study follows; the findings are stated in the same sequence as the previously presented list of hypotheses:

1. There were significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils on the Science Research Associates Assessment Survey instrument in favor of the non-early childhood education pupils. There were no significant differences found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments for both pupil types. There were significant negative correlations found on the Science Research Associates Assessment Survey instrument. There were no significant correlations found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments.

2. There were significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable sex on the Science Research

Associates Assessment Survey instrument in favor of the non-early childhood education pupils. However, no significant differences were found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. There were significant negative correlations found on the Science Research Associates Assessment Survey instrument. There were no significant correlations found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments.

3. There were significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable grade level on the Science Research Associates Assessment Survey instrument in favor of the non-early childhood education pupils. There were no significant differences found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. There were significant correlations found on the Science Research Associates Assessment Survey instrument. Correlation coefficients were not computed for either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments.

4. There were significant correlations found between achievement test scores of both pupil groups and the variable age on the Science Research Associates Assessment Survey instrument. There were no significant correlations found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. There were no significant differences found on all three test instruments as analysis of variance techniques were not employed for this variable.

5. There were significant differences found between achievement test scores of early childhood education pupils and non-early

childhood education pupils and the variable socioeconomic status on the Science Research Associates Assessment Survey instrument in favor of the non-early childhood education pupils. There were no significant differences found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments for both pupil types. There were no significant correlations found on all three test instruments.

6. There were significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable home stability on both the Metropolitan Readiness Test (in favor of the early childhood education pupils) and Science Research Associates Assessment Survey (in favor of the non-early childhood education pupils) instruments. There were no significant differences found on the Boehm Test of Basic Concepts instrument for both pupil types. There were significant negative correlations found on both the Metropolitan Readiness Test and the Science Research Associates Assessment Survey instruments. There were no significant correlations found on the Boehm Test of Basic Concepts instrument.

7. There were significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable parental employment status on the Science Research Associates Assessment Survey instrument in favor of the non-early childhood education pupils. There were no significant differences found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments for both pupil types. There were significant negative correlations found on the Science Research Associates Assessment Survey instrument. There were no

significant correlations found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments.

8. There were significant negative correlations found between achievement test scores of both groups and the variable degree of Indian blood on the Metropolitan Readiness Test instrument. There were no significant correlations found on either the Boehm Test of Basic Concepts or the Science Research Associates Assessment Survey instruments. There were no significant differences found for the analysis of variance techniques employed on all three test instruments.

9. There were significant negative correlations found between achievement test scores of both groups and the variable tribal affiliation on all three test instruments. However, there were no significant differences found for the analysis of variance techniques employed on all three test instruments.

10. There were no significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable parental education of the father on all three test instruments. There were significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable parental education of the mother on both the Science Research Associates Assessment Survey (in favor of the non-early childhood education pupils) and Metropolitan Readiness Test (in favor of the early childhood education pupils) instruments. There were no significant differences found on the Boehm Test of Basic Concepts instrument for both pupil types and parental education of the mother. There were significant correlations found for the parental education of the mother

variable on both the Metropolitan Readiness Test and the Science Research Associates Assessment Survey instruments. There were no significant correlations found for the parental education of the mother variable on the Boehm Test of Basic Concepts instrument. There were no significant correlations found for the parental education of the father variable on all three test instruments.

11. There were no significant differences found between achievement test scores of early childhood education pupils and non-early childhood education pupils and the variable school attendance on all three test instruments. There were no significant correlations found on all three test instruments as well.

Discussion

The findings indicated that pupils who did not participate in an early childhood education had a significantly higher mean score average than pupils who did participate in an early childhood education program on the Science Research Associates Assessment Survey instrument and a slightly higher mean score average on the Boehm Test of Basic Concepts instrument; however, early childhood education pupils had a slightly higher mean score average on the Metropolitan Readiness Test instrument. As previously mentioned in chapter IV, the mean scores by grade level indicated that early childhood education pupils had higher mean score averages than non-early childhood education pupils per grade level on the Metropolitan Readiness Test and the Science Research Associates Assessment Survey instruments but a slightly lower average on the Boehm Test of Basic Concepts instrument. Thus, even though significant differences were found at the .01 level for the majority of the pupils (230 out of 302) on the Science Research

Associates Assessment Survey instrument, this writer would caution the reader about drawing erroneous conclusions about the Devils Lake Sioux Early Childhood Education program based on data from a single school year. Again, it should be noted that caution should be taken in interpretation of the analysis of variance due to the low frequency of subjects in the early childhood education group at the sixth grade level. Because only one grade level was tested with the Metropolitan Readiness Test and the Boehm Test of Basic Concepts, the grade level is better controlled than it is on the Science Research Associates Assessment Survey. This suggests that more credence should be given to the results of data obtained from the Metropolitan Readiness Test and the Boehm Test of Basic Concepts. In other words, significant differences found using analysis of variance and correlation coefficients of achievement test scores for both pupil types may be subject to different interpretations, depending upon the reader's viewpoint.

In comparing the means for both pupil types and the variable sex, the results indicated that females had higher mean scores than did males on the Metropolitan Readiness Test and Boehm Test of Basic Concepts instruments and significantly higher means on the Science Research Associates Assessment Survey instrument. It should be pointed out that females from both groups (early childhood education and non-early childhood education), without exception, had higher means for all three instruments.

Correlation coefficients were used to determine significant correlations of achievement test scores and the variable age for both pupil types. The results indicated that significant correlations existed between the two groups on the Science Research Associates

Assessment Survey instrument but not for either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. Havighurst (1970), in his national study, is of the opinion that the Indian student's age becomes more critical with regard to the lower achievement test scores at the high school level.

In analyzing the means for both pupil types and socioeconomic status, the results indicated that this variable does not seem as much of a factor for early childhood education pupils as it does for non-early childhood education pupils. On both the Metropolitan Readiness Test and the Boehm Test of Basic Concepts, the early childhood education pupils from the low socioeconomic status category had slightly higher means than early childhood education pupils from the high socioeconomic status group. According to the studies done by Coleman (1966), Bloom (1965), Deutsch (1965), Hess and Shipman (1965), and Havighurst (1970), these findings appear to be somewhat incongruous. On the other hand, non-early childhood education pupils from the high socioeconomic status group had higher means than did non-early childhood education pupils from the low socioeconomic status group on both the Metropolitan Readiness Test and Boehm Test of Basic Concepts instruments and significantly higher means on the Science Research Associates Assessment Survey instrument, which appear to be in line with the previously mentioned studies. Thus, for this particular variable, the findings appeared to be mixed.

The analysis of the home stability variable indicated that early childhood education pupils had higher means than non-early childhood education pupils in the mother only category on the Metropolitan Readiness Test instrument. The means for the Science Research

Associates Assessment Survey instrument indicated that non-early childhood education pupils had significantly higher means than early childhood education pupils for the both parents, father only, mother only, and relatives categories for this variable. The research done by Schaefer (1973), Gordon (1972), Butler (1970), Jester (1969), White (1974), Clarke-Stewart (1977), Hyman (1975), Kifer (1976), and Moore (1976) concurs that the family has the most influence on the child and the school achievement. Particularly noteworthy is Jester's study in which he reveals that the mother has more influence upon the child.

The results for the variable parental employment status indicated that non-early childhood education pupils had significantly higher means than early childhood education pupils for the fully employed and part-time employed categories on the Science Research Associates Assessment Survey instrument. The findings on the Metropolitan Readiness Test and Boehm Test of Basic Concepts instruments revealed that no significant differences existed between the two groups of pupils. This variable may tie in with the socioeconomic status variable; however, at this time, no definite conclusions can be made as to the nature of this relationship.

A highly significant negative correlation was found on the Metropolitan Readiness Test instrument for the variable degree of Indian blood. However, the analysis of variance for all three test instruments reveals no significant differences between the two groups of pupils. In analyzing the means for this particular variable, it would appear that mixed bloods scored slightly higher than did full bloods on the Metropolitan Readiness Test instrument. As for the results on the Boehm Test of Basic Concepts and Science Research Associates Assessment

Survey instruments, the findings appear to be mixed. It should be pointed out that the majority of pupils (173 out of 302) were full-blooded Indians. According to previous studies done by Cress and O'Donnell (1974), Bryde (1970), and Garth (1923), mixed bloods had higher intelligence scores than did full bloods. Again, no definite conclusions can or should be drawn from the findings of one test instrument.

The results of the findings of the tribal affiliation variable indicated that no significant differences were found using analysis of variance techniques for all three achievement tests. However, significant correlations were found for Turtle Mountain Chippewa pupils on the Metropolitan Readiness Test; and significant negative correlations were found for the non-Indian pupils on the Metropolitan Readiness Test, for the Devils Lake Sioux pupils on the Boehm Test of Basic Concepts, and for the Turtle Mountain Chippewa pupils on the Science Research Associates Assessment Survey instruments. Some support of these findings was found in the research of Telford (1932), who examined relationships between test performance of Sioux and Chippewa students in North Dakota.

The analysis of the variable parental education of the father indicated that no significant differences were found on all three test instruments; however, there were significant findings on the parental education of the mother variable for the non-high school graduate, high school graduate, and some college categories on the Science Research Associates Assessment Survey instrument. No significant differences were found on the other two test instruments. The results of the correlation coefficients reveal significant correlations on both the

Metropolitan Readiness Test and Science Research Associates Assessment Survey instruments but not on the Boehm Test of Basic Concepts instruments. Therefore, it can be concluded that the parental education of the mother is a factor in achievement test scores on the Metropolitan Readiness Test and Science Research Associates Assessment Survey instruments. It was mentioned previously that the mother has more influence on a child (Jester 1969).

The results of the school attendance variable indicated that no significant differences were found between the two groups of pupils. However, it may be worthy to note that the early childhood education pupils missed three days per year fewer, on an average, than did the non-early childhood education pupils. Possibly, the Early Childhood Education program may account for this positive factor which most school administrators would deem a worthy character trait by any standard.

Conclusions

In summary, the following major conclusions emerged from this study:

1. In considering the totality of this study with particular reference to academic achievement test scores of the two groups of pupils (early childhood education and non-early childhood education), the findings revealed that significant differences were found between these two groups on the Science Research Associates Assessment Survey instrument; and no significant differences were found on either the Metropolitan Readiness Test or the Boehm Test of Basic Concepts instruments. However, it was further concluded that the statistical methods employed did not take into account the per-grade-level factor on the Science Research Associates Assessment Survey instrument where there

were more non-early childhood education pupils than early childhood education pupils at the sixth grade level, thus skewing the results in favor of the non-early childhood education pupils. The disproportionate nature of the data required a more complex solution; when grade level was taken into account, it appears that the significance would disappear.

2. Several of the selected demographic variables were found to be significantly related on all three test instruments. Significant relationships were found on the Metropolitan Readiness Test instrument on the variables home stability, degree of Indian blood, tribal affiliation, and parental education of the mother. Significant relationships were found on the Boehm Test of Basic Concepts instrument on the variable tribal affiliation. Significant relationships were found on the Science Research Associates Assessment Survey instrument on the variables achievement, sex, grade level, age, socioeconomic status, home stability, parental employment status, tribal affiliation, and parental education of the mother. It was further concluded that these selected demographic variables, on all three test instruments, differed somewhat between the two groups of pupils being investigated.

3. Several of the selected demographic variables were not significantly related on all three test instruments. No significant relationships were found on the Metropolitan Readiness Test instrument on the variables achievement, sex, grade level, age, socioeconomic status, parental education of the father, and school attendance. No significant relationships were found on the Boehm Test of Basic Concepts instrument on the variables achievement, sex, grade level, age, socioeconomic status, home stability, degree of Indian blood, parental education of the father, parental education of the mother, and school

attendance. No significant relationships were found on the Science Research Associates Assessment Survey instrument on the variables degree of Indian blood, parental education of the father, and school attendance. The variables which had no significant relationships for all three test instruments were parental education of the father and school attendance.

Recommendations

Several recommendations were suggested from this study which would be helpful for future research in the areas of preschool education and minority education.

1. Further research is recommended on all four reservation areas in North Dakota to determine if academic achievement differences exist between pupils with preschool experience and pupils without preschool experience. These studies might help to assist the various tribal and federal officials in determining funding priorities.

2. Although the present study employed an adequate sample size and utilized appropriate statistical techniques and sampling methods, a replication study involving more equal grade level distribution might provide more conclusive results. Alternatively, a much larger sample could be drawn; subsampling within grade levels could then be done to more adequately test the hypotheses.

3. It is recommended that future research include non-Indian pupils to determine if selected demographic variables correlate with academic achievement when comparing non-Indian and Indian pupils. Such research might uncover divergent background factors which correlate with academic achievement.

4. It is recommended that a longitudinal study be done of these pupils at the end of five years to determine if their preschool

participation positively influences academic achievement beyond the elementary school. It is quite possible that preschool participation may influence academic achievement in later years at the secondary level.

5. It is recommended that research be initiated to include Indian educational achievement on a regional and national basis for both rural and urban Indians. Such research may be helpful to determine if preschool education programs positively influence academic achievement for Indian pupils at the elementary level and later on at the secondary level.

6. It is recommended that additional research be conducted to determine at which grade level preschool education experiences have the most effect on positively influencing academic achievement. Such research might be helpful for educators to be more aware of any negative patterns or trends which may be taking place at the various grade levels.

7. There seems to be no apparent, lasting positive impact on achievement as a result of participation in early childhood education programs. If additional research continues to verify this point, it is recommended that policymakers for Indian education should re-evaluate where to best use available resources. The nature of the continuing school experiences for children who come from early childhood education programs with an apparent initial advantage may need to be altered in order to maintain, and perhaps, enhance that achievement.

8. It is recommended that policymakers consider expending more monies at the junior and senior high school levels where achievement is apparently lower and dropout problems occur more frequently.

Educational leaders for each reservation area should make these financial considerations based on local findings.

9. It is recommended that Indian educational organizations (state and national) conduct periodic needs assessments at the local, state, and national levels in order to provide local, state, and federal agencies pertinent information on the effects of preschool education programs on the reservations. Such information will help local school boards, tribal education committees, and federal officials to properly evaluate preschool programs.

10. Finally, it should be noted that academic achievement represents only one type of accomplishment. Parental involvement, teacher attitudes, school facilities, and teacher training for Native Americans at all levels of education play a unique role in the overall education of the pupils attending reservation schools. It is recommended that research be undertaken concerning these factors in order to gain more insight into the area of Indian education.

APPENDIX A

LETTER OF AUTHORIZATION

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
FORT TOTTEN AGENCY
FORT TOTTEN, NORTH DAKOTA 58335

REPLY REFER TO:
Education

July 11, 1980

Memorandum

To: *Mr. Mark Motis, Principal, Fort Totten Elementary School*
Fort Totten, North Dakota

Mr. George Dunbar, Principal, St. Michael Tribal School
St. Michael, North Dakota

Mr. Albert Hohenstein, Superintendent, Fort Totten Public School, Fort Totten, North Dakota

Mr. Vern Lambert, Director, Early Childhood Education,
Fort Totten, North Dakota

From: *Acting Education Program Administrator, Fort Totten Agency,*
Fort Totten, North Dakota

Subject: *Authorization to conduct survey using school records*

Please be advised that I have given John E. Derby permission to use our school files to get group information for his Dissertation Entitled: "Achievement and Selected Demographic Variables in Relation to Participation in the Early Childhood Education Program on the Devils Lake Sioux Reservation." A copy of his project as outlined is attached.

If at anytime you feel you cannot cooperate with this authorization please let me know.

Sincerely,

Sylvester J. Gores

Sylvester J. Gores
Acting Education Program Administrator

Attachment:

SJG:jb:7/11/80

APPENDIX B

PUPIL INFORMATION REPORT

PUPIL INFORMATION REPORT

Reported by _____
Position _____
Date _____

(01) Name _____ (02) Boy ____ Girl ____

(03) Age to the nearest year as of July 1, 1978, is _____.

(04) Last grade level? K 1 2 3 4 5 6

(05) School attended? Ft. Totten ____ St. Michael ____

(06) ECE Pupil ____ Non-ECE Pupil ____

(07) Metropolitan Test Scores, if applicable

Composite Score: ____

(08) Boehm Test Scores, if applicable

Composite Score: ____

(09) SRA Test Scores, if applicable

Composite Score: ____

(10) Is pupil Indian ____ or non-Indian ____?

(11) If Indian, degree of Indian blood: (1) 1/8 to 1/4 (2) 1/4 to 1/2 (3) 1/2 to 3/4 (4) 3/4 to 7/8 (5) Full

(12) Tribal affiliation of pupil: D.L. Sioux T.M. Chippewa Other

(13) Socioeconomic Status: For each pupil indicate the condition that best describes the parents and/or guardians who brought up this pupil or are responsible for him.

____ They are quite well off and can afford to help this pupil with money for clothes and other things needed for school.

____ They are not well off, but they can manage to help at least with some money for clothes and the things this pupil needs for school.

____ They are really having a hard time and they can hardly get any money at all to help this pupil get clothes and things for school.

(14) Is pupil living with:

_____ Both a father and a mother

_____ Father only

_____ Mother only

_____ Guardian(s)

_____ Relative(s)

(15) Employment Status: For each pupil indicate the overall employment status of the parents and/or guardians who brought up this pupil or are responsible for him.

_____ Fully employed (one or both)

_____ Partially employed (one or both)

_____ Unemployed (one or both)

(16) Education of father: Non-HS Grad HS Grad Some College College Grad MA Degree or Above

(17) Education of mother: Non-HS Grad HS Grad Some College College Grad MA Degree or Above

(18) If applicable, education of guardian (male): Non-HS Grad HS Grad Some College College Grad MA Degree or Above

(19) If applicable, education of guardian (female): Non-HS Grad HS Grad Some College College Grad MA Degree or Above

(20) If applicable, education of relative (male): Non-HS Grad HS Grad Some College College Grad MA Degree or Above

(21) If applicable, education of relative (female): Non-HS Grad HS Grad Some College College Grad MA Degree or Above

(22) Days pupil was absent during the 1977-78 school year _____.

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