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THE EFFECT OF NURSERY SCHOOL EXPERIENCE UPON  
READINESS OF CHILDREN IN KINDERGARTEN

by

Glenna C. Boyce

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Family and Child Development

APPROVED:

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Major Professor

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Dean of Graduate Studies

UTAH STATE UNIVERSITY  
Logan, Utah

1969

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Glenna C. Boyce

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## ABSTRACT

The Effect of Nursery School Experience Upon  
Readiness of Children in Kindergarten

by

Glenna C. Boyce, Master of Science

Utah State University, 1969

Major Professor: Dr. Jay D. Schvaneveldt

Department: Family and Child Development

The Metropolitan Readiness Test, 1964 edition, Form A, was administered to forty children who were enrolled in kindergarten classes in Logan, Utah, during the school year 1967-1968. Twenty of these children (nursery attenders) had attended the Utah State University Child Development Laboratory for at least two, but not more than three quarters with at least half of this nursery experience being during the year preceding kindergarten. The other 20 children (non-attenders) had not experienced any type of pre-school or day care program prior to kindergarten. The two groups were matched by pairs on age, sex, kindergarten teacher and socio-economic level of the father. The sample of 40 included 12 pairs of boys and eight pairs of girls.

The primary null hypothesis was rejected because the nursery attenders did significantly better (to the .05 level) on the Metropolitan Readiness Test than the non-attenders. In analyzing this result, sex was found to be an important variable. The boy nursery school attenders did significantly better (to the .01 level) than the boy non-attenders on the Metropolitan Readiness Test. There was no significant

difference between the scores of the girl nursery attenders and the girl non-attenders although the nursery attenders tended to score higher on the Metropolitan Readiness Test.

However, the secondary null hypothesis was held tenable. The variables of mother's education, mother working outside of home, number of children in family and birth order position were not found to be significantly related to readiness.

(71 pages)

## INTRODUCTION

### Origin of the Problem

The influence of a nursery school experience on success in later schooling has been the subject of research for the last thirty years with the basic assumption being that attendance at preschool is beneficial and helps prepare the child for school. The influence of preschool experience has been looked at from several viewpoints; the two most common ones have been its effect on intelligence and on social development.

Much research on the effect of nursery school on IQ was done at the Iowa Child Welfare Research Station as part of their research concerning the relationship between different environments and intelligence. Wellman (1943) in summarizing the findings of this research on the effect of preschool attendance on intelligence stated that the findings generally indicated gains in I.Q. by children attending nursery school. In contrast, other institutions have not verified these results, but instead have found no significant relationship between preschool attendance and changes in I. Q.

Research has also been done to see if preschool experience increases social development and social maturity. Again findings have been contradictory and inconclusive. Some researchers (Bonney and Nicholson, 1958; Douglas, 1964) have found that those who had preschool experience do not have an obvious advantage in personal-social behavior over those who had not had preschool experience. Other researchers



(Cusing, 1934; Kawing and Hoefler, 1931; Allen and Masling, 1957) have found slight differences in favor of preschool attenders over nonattenders. Finally, some studies (Walsh, 1931; Hattwick, 1936) have shown positive results in favor of preschool attenders.

Although differences in purposes, methodology, ages of subjects when tested and instruments used account for some of the differences in the above findings, it is assumed that the results show no clear-cut findings. Another factor in much of this research is that in many of the studies the effect of preschool experience has been studied as to its effect on school performance in later grades. It may be more relevant to study the effect of preschool experience on an immediately subsequent experience--performance in kindergarten.

Much of the early research was done at university nursery schools and/or with middle class children. Recently interest has turned to the lower class children--children from deprived environments. Again the relationship between early childhood experience and school performance is being investigated and the importance of the preschool experience is being evaluated. Research has shown that children from these deprived environments do not do as well in school as their middle class counterparts. Deutsch (1966b), suggests the use of a preschool experience as a cultural bridge between the home and school. This use of a preschool experience as a cultural bridge (often under Head Start programs) has in many cases increased school readiness. This preschool experience seems especially to aid language development.

Recently researchers have also been impressed with the amount young children are capable of learning. Several (Fowler, 1962; Hunt, 1961; Bruner et al., 1966) have proposed that research needs to be

done to investigate more fully what and how all children learn and what kinds of early childhood experiences increase later learning.

In light of contradictory findings concerning the effects of preschool on intelligence and social development, the scarcity of research studying the effect of preschool experience on an immediately subsequent experience (kindergarten), and the recent interest and research in how children learn and what kinds of early experiences increase later learning, a study of the effects of a typical university child development laboratory preschool seemed to be a beneficial addition to this area of research. Does preschool experience in such a university child development laboratory significantly affect performance in kindergarten and readiness for school?

#### Purpose

This study sought to determine whether or not the preschool experience, which encouraged learning experiences and language development, made a significant difference in readiness for school and performance in kindergarten. This performance in kindergarten and readiness for school has been ascertained by performance on a readiness test in kindergarten.

#### The Concept of Readiness

The term readiness and its definition have been the subject of much research and discussion. The definitions are varied, but there is general agreement that readiness is dependent on many factors. According to the *Metropolitan Readiness Test* (1949), the chief factors that contribute to readiness for beginning school work are linguistic

attainments and aptitudes, visual and auditory perception, muscular coordination and motor skills, number knowledge and the ability to follow directions and to pay attention in group work. These skills depend on many factors, such as intelligence, home background, health and physical condition, degree of emotional maturity and social adjustment and general background experience.

The concept of readiness is being used in this study because it correlates more closely with actual school performance than do the concepts of IQ or social maturity, and because this is the trend in present-day research and use by school personnel. According to Hildreth (1950), "Readiness tests tend more than intelligence tests to reveal the extent of the learning the child derives from his background." She also adds that the six sub-tests in the Metropolitan Readiness Tests have been selected on the basis of their proven validity for predicting success in the first grade. For these reasons school personnel and researchers are using measures of readiness more, because these instruments reveal what they want to know--how a child is performing and at what level of readiness he is. The concept of readiness also has a limitation because it is such a generalized term with many different meanings and definitions. For this study the concept of readiness given above will be used and will be operationally defined as the score attained on the Metropolitan Readiness Test.

#### Hypotheses

1. There is no significant difference in performance on a readiness test in kindergarten between children who have attended nursery school and children who have not attended nursery school.

2. Readiness is not significantly related to any of the following variables:

- a. Mother's education.
- b. Mother working outside home.
- c. Number of children in the family.
- d. Birth order position.

## REVIEW OF LITERATURE

The influence of preschool experience on success in later schooling has been the subject of research for over thirty years. The two major areas of research have been, as follows: (1) the effect of preschool experience on intelligence and (2) the effect of preschool experience on social development. Since both intelligence and social adjustment have been named by the Metropolitan Readiness Test (1949) as factors affecting readiness and/or success in school the research in both areas will be reviewed. Most of the research in these two areas have been done in university nursery schools and with children in the upper middle class. Research with children in deprived environments (institutions or lower class, culturally disadvantaged homes) is also reviewed to give a more complete picture. Finally some recent theories of learning are reviewed.

### Preschool Experience and Intelligence

The most extensive work in the area of the effect of nursery attendance on intelligence has been carried out at the Iowa Child Welfare Research Station. Wellman (1932, 1940, 1943) studied the records of the children who had attended the Iowa Preschool Laboratories from 1921 to 1938. Out of 808 children who had been enrolled for at least one regular year during this time, 652 had complete enough records to be included in the studies. The tests used were the Kuhlman or Stanford revision of the Binet Scale. The following is a summary of the findings of the several studies done in this series (Wellman, 1932,

1940, 1943): (1) The principal gains in IQ were made during preschool attendance (fall to spring) and not during non-attendance (spring to fall). For the 652 children the mean gain from fall to spring was +6.6. For the 317 children who attended a second year there was no significant change in IQ over the summer. (The mean change was a -1.1.) (2) Gains in IQ were cumulative over several years, but the gains became less pronounced with successive years. On 201 children the mean gain was +7.4 from fall 1 to spring 1 and was +3.3 from fall 2 to spring 2. (3) Cultural status of parents affected the initial score, but not the later scores. Children from lower cultural levels gained at the same rate as children from higher levels did. (4) Gains from preschool attendance appeared to be reflected in school achievement. (5) There was a tendency for those who attended more days within the school year and for those who attended all day sessions to make greater gains. (6) The greatest gains were made by the children classified in the lower levels of IQ by the initial test and the least gains were made by those in the highest levels of IQ.

In another study Wellman (1938) used the Merrill-Palmer Scale of Performance as the measuring instrument. These findings supported the conclusions reported above. Significant gains were made over the winter months when the children were enrolled in preschool. Over the summer vacation months the changes were not significant. The gains in IQ over the winter months were inversely proportional to the initial IQ level.

Wellman also tested children of comparable IQ and age who had not attended preschool. In one study (Wellman, 1934, 1943) the subjects were 68 children from Iowa City. They were given the Stanford-Binet or Kuhlman revision. The initial mean IQ was 118.0 and the mean change

was -1.8 when tested an average of 8.2 months later. (The initial test was in the fall and the second test was in the spring.) Thirty-four of these were again tested the following fall and the mean change was -3.9. Therefore, the changes in IQ of nonpreschool children were similar to those of preschool children during periods of nonattendance. However, there was no tendency for them to make the gains from fall to spring which was characteristic of the preschool group.

In one summary article by Wellman (1943), the findings of V. Messenger, a doctoral student, are reported. In this study 22 nonpreschoolers were compared with 20 preschoolers. These two groups were similar in socio-economic status of parents, initial IQ and age. After two years the difference in IQ between the two groups was statistically significant in favor of the nursery school.

These studies done at the Iowa Child Welfare Research Station are in agreement with the study done by Woolley (1925) which was the first study done in this area. In this initial study two groups (those attending the Merrill-Palmer nursery school and those on the waiting list) were given two intelligence tests. Sixty-three percent of the nursery school attenders increased in IQ with the mean increase being +19.7. In this same group 18.5 percent decreased in IQ with the mean decrease of -10.8 and 18.5 percent remained constant (within a range of a 5 percent change). In the waiting list group 33 percent gained in IQ with the mean increase being +12.7, 36 percent decreased in IQ with the mean decrease being -16.2 and 31 percent remained constant.

Starkweather and Roberts (1940) did a similar study at the Merrill-Palmer Institute later. They attempted to employ the same methods used by Wellman to find out what happened to IQ during nursery attendance.

Their findings, which generally support Wellman's findings, were as follows: (1) Children attending the Merrill-Palmer Nursery School gained in IQ as measured by the Stanford Binet and Merrill-Palmer retests. (2) An inverse relationship existed between initial IQ and IQ gains. (3) Varying lengths of attendance showed no relationship to IQ change. (4) Results of retests following withdrawal from nursery school indicate that the IQ changes occurring during attendance were real and tended to be maintained.

Frandsen and Barlow (1940) also found similar findings. In their study at the Utah State Agricultural College, an experimental group of 30 was matched with a control group of 28 on age, socio-economic status, home-habit training and approximately for sex. The two groups were tested with the Stanford Binet Intelligence Scale at the beginning and end of the term. The nursery school group gained 3.34 and the control group gained .53. According to the authors the difference approximated the criterion for statistical significance. However, the authors concluded that, "The gain for the experimental group, although it approximates statistical significance appears very small when compared with the whole range of individual differences in IQ resulting from both hereditary and environmental causes." (Frandsen and Barlow, 1940, p. 147)

Stoddard and Wellman (1940) summarized their theory of intelligence in light of the above findings and other studies done at Iowa which show that environment affects IQ. Their summary statement is, as follows: "In essence what may be termed the 'Iowa-Binet theory of intelligence' simply permits a large amount of change in a child's



brightness through environmental impingements on the organism: the growing child changes his rate of growth." (Stoddard and Wellman, 1940, p. 436)

This theory did not agree with the general theory accepted at this time--this theory being that intelligence is fixed and that it is determined mainly by heredity. The following studies done at various institutions supported this more generally accepted view of intelligence. Anderson (1940) found no significant difference between 17 nursery attenders and 17 non-attenders. He also found no significant cumulative gain in IQ from attendance at nursery school.

Bird (1940) found negligible gains in IQ after a year's schooling in an accelerated or enriched program which offered reading as part of it's curriculum. Goodenough and Mauer (1940) used Minnesota Pre-school Tests and classified sub-groups according to occupational status. They concluded that none of the analyses warranted the conclusion that attendance at the University of Minnesota Nursery School had any measurable effect whatever on the mental development of the children. Those who had the nursery training did no better on the IQ tests than those who didn't have the training.

Jones and Jorgensen (1940) compared 54 children who attended the University of California Nursery School with various groups of controlled children. The groups were matched on mean IQ at a given age level and the number of years of schooling of the parents. They found no significant difference in the mental growth curves of the experimental and control groups and that IQ gains were not correlated with length of attendance.

Kawin and Hoefer (1931) matched 22 children on sex, mental age and chronological age. Approximately two thirds of the subjects came from a middle class area and one third from a lower class area. The children were tested before and after the experimental group attended nursery school (a seven month interval). Both groups gained in mental growth, but there was no significant difference between the group gains on the Merrill-Palmer Scale.

Lamson (1940) tested children in kindergarten, first and second grades. The experimental group was 25 children who had attended two years of nursery school and the control group was forty-four children (those whose names on the teacher roles were immediately before or after the names of nursery children and were of the same sex) who had not attended nursery school. The *t* ratios were not significant for either IQ scores or reading achievement.

Olson and Hughes (1940) found that an uncontrolled comparison of the subsequent growth of children with and without nursery school experience demonstrated a superiority in mental age for those with nursery experience. However, when the sample was controlled for profession of parents, the difference disappeared. Secondly, children who attended more (a mean of 225 days) nursery school did not do significantly better than those who attended less (a mean of 117 days).

McHugh's (1943) research doesn't agree entirely with either those who have found an IQ increase or those who have found no increase. His research instead suggests other variables involved. He tested 91 children before entering kindergarten and retested them a mean of 1.93 months later. He found conclusive evidence that children do make significant gains, but that this was due to adjustment (particularly due

to improvement in the use of oral speech in the testing situation), not growth in intellectual capacity. He does say that his results do not rule out a possibility of a real growth in IQ after the one month of preschool experience. There was a trend toward an inverse relationship between CA at time of initial testing and IQ gain on final test. IQ gains were not related to improvement in examiner's rapport with child on the second test or social maturity (as scored on the Vineland Social Maturity Scale). Finally, IQ gains were not significantly related to socio-economic and educational status of parents or home ratings. However, evidence offered a positive relationship between the lack of school-like experience before entrance to preschool and gain in IQ after preschool experience.

#### Preschool Experience and Social Development

The findings in the research on the effect of nursery attendance on social development are also varied. Several studies have revealed no significant differences between nursery attenders and non-nursery attenders. Bonney and Nicholson (1958) found that in a group of 402 subjects from grades one to six the nursery and/or kindergarten attenders had no advantage in personal-social behavior. Both a sociometric test and teacher evaluation were used. Their study using sixth graders also showed no significant difference between those who had attended nursery and/or kindergarten and those who had not on social adjustments. Douglas and Ross (1964) also found that nursery attendance was not followed by better than average emotional adjustment or less delinquency in later life. His subjects were assessed at ages 13 and 15. He suggested, however, that this conclusion be tentative

because this group of nursery attenders were highly selected, a relatively large proportion of them came from poor homes with low standards of care and much overcrowding, and some may have been sent to nursery school because they had behavior problems.

Several studies have revealed trends or shown slight differences in favor of nursery attenders over non-attenders. Cushing (1934) found that the nursery school group did appear to be rated by the teachers as somewhat superior in total adjustment to the situation and in general attitude; however, "no striking differences" were observed between the two groups. Kawin and Hoefer (1931) found a trend in favor of the nursery group in elimination of undesirable habits at home. A larger percent of the nursery group eliminated "undesirable" habits and habits which indicate a lack of independence and acquired a greater number of "desirable" habits and those indicating emancipation from adults. However, these were trends and no statistical treatment was done with these data other than percentages. Allen and Masling (1961) found that on the basis of a sociometric test there were no significant differences between choices for those who had attended nursery school over those who had not in the kindergarten and first grade samples. However, there was a significant difference in the second grade group with the nursery attenders having been chosen more. They concluded by stating "that nursery school subjects were seen by their classmates as being more spontaneous and more intelligent." (Allen and Masling, 1957, p.295)

Some studies show positive results. Walsh compared a nursery and control group and found "that the nursery school children became less inhibited, more spontaneous and more socialized with training. They developed more initiative, independence, self-assertion and self

reliance than the control group." (Walsh, 1931, p. 72) The findings of this study were said to be significant, but no levels of significance were shown.

Van Alostne and Hattwick (1939) studied 165 graduates of nursery school to see how early trends in behavior patterns were related to later behavior patterns. Generally the nursery school behavior paralleled the behavior observed later in the upper grades. An indicative aspect discovered was reaction to failure. The children who were more adaptable and flexible in nursery school were better adjusted in school; those who showed behavior problems in nursery school tended still to have behavior problems in school. The nursery school group was also compared to the general school population on the Winnetka Scale and the nursery school group showed better emotional adjustments and leadership. They were better in their reaction to failure, independence of adult approval, direction of group tasks and independence of adult help.

In another study, Hattwick (1931) compared children (ages 3 and 4) who had had nine months of nursery school with those who had had six weeks of nursery school and found that on most items involving social behavior and routine adjustments the more experienced nursery school pupils were reliably superior to those who had been in attendance only six weeks.

Jersild and Fite (1937) observed 18 children in nursery school in the fall and the following spring. They recorded the number and kind of social contacts. Nine of the children had been together before (old group) and nine had not (new group). Of this second nine seven had had no previous nursery school experience and two had been to different nursery schools. In the fall the number of social contacts

for the old group was much higher than for the new group. Both groups gained in the number of social contacts by spring, but the new group gained more. The authors summarized their findings in the following statement: "On the whole, the results tend to agree with earlier findings to the effect that nursery school experience promotes the child's social development, although some children may fail to show much benefit and some measures of apparent improvement may not mean as much as they seem to show." (Jersild and Fite, 1937, p. 165)

Vitz (1961) observed behavioral changes during a period of a seven week summer session of the Stanford University Nursery School. Forty children were observed at the first and the last of the session in ten minute random observations with the following types of behavior being noted in thirty second intervals: (1) aggression, (2) adult-like (more mature behavior such as comforting others or role playing), (3) dependency, (4) thumb-sucking and (5) disciplinary behavior (disciplining one another--pro-social aggression). During the seven weeks aggression decreased from 13.4 percent to 7.9 percent for the boys and from 3.5 percent to 3.1 percent for the girls. Adult-like behavior increased from 15.5 percent to 19.4 percent for the girls and from 11.9 percent to 17.0 percent for the boys.

Brown and Hunt (1961) found opposing findings. They found that the non-nursery children were perceived by teachers to be significantly better adjusted than nursery school children in personality adjustments, relations with other children and in participation in group activities. Lamson (1940) also found that with the teachers rating the nursery and non-nursery children on a scale devised by the investigator that the results were in favor of the non-nursery group.

Differences in purposes, methods, ages of subjects when tested and instruments used would probably account for some of the differences in the above findings, but the investigator agrees with the conclusion of the critical review by Swift. She summarizes that, "There are no clear-cut findings which reflect superior social adjustment on the part of children who have attended nursery school over these who have not." (Swift, 1964, p. 255)

Children From Deprived Environments  
and Preschool Experience

Studies (Crissey, 1937; Skeels, 1937, 1940, 1966; Skeels et al., 1938; Dawe, 1942; Kirk, 1958) on children living in deprived environments in institutions show a relationship between intelligence and learning and the types of environmental experiences children have had. In a summary article of Iowa studies concerned with the relationship between mental growth and environmental differentials Skeels (1940) emphasizes the relationship between environment and learning abilities. His summary includes the following findings: (1) The longer children are in underprivileged homes, the more the IQ decreases. (2) With a shift from inferior homes to superior adoptive homes IQ increases with the greater gains being made by those who initially scored lower and those whose true mothers had higher education. (3) The mean IQ for children who had been placed in superior adoptive homes before they were six months was 116. (4) A change from a non-stimulating institutional environment to one of more marked stimulation (preschool attendance) was associated with an increase in IQ. This last point is more fully discussed below. The permanence of the effects of the

environment on the intelligence and general well-being of individuals has been demonstrated by the recent followup study completed by Skeels (1966). The 13 experimental subjects (those who had been exposed to a one-to-one relationship with an adult who was generous with love and affection and provided experiential stimulation of many types) were found to be all self-supporting after a period of 21 years. Of the 11 contrast subjects (those who were not initially mentally retarded and remained in the custodial, non-stimulating environment of the orphanage) one had died and eight were still wards of institutions. The two groups also differed significantly in education, occupational level, marital status and number of children.

When deprived institution environments have been improved by the introduction of a nursery program as in the studies of Dawe (1942) and Kirk (1959) learning achievement has been increased. Dawe found a great increase in language, vocabulary development and reading readiness for the experimental group over the control group. Skeels et al. (1938) found that a nursery school program helped specifically by preventing or counteracting losses caused by the orphanage environment. This three year study compared two matched groups, one of which attended the orphanage preschool. On the Binet tests of intelligence the difference between the control and experimental groups increased and the loss in intelligence, social maturity, etc. was cumulative for the control group. For the children with an initial IQ of 50-79 points the experimental group gained an average of 7.7 points over a 20 month period and the control group gained 3.1 points. For the children with an initial IQ of 80 points and above, those in the experimental group remained approximately constant while those in the control group lost



an average of 16.2 points over the 20 months. The results of the Merrill-Palmer Scale of Performance were similar to the Binet results. Preschool attendance did not seem to have succeeded to any degree in counteracting losses in language quotient, but it did have some effect on improved behavior adjustment and social maturity, although these were not brought up to the national averages.

Recently children from culturally disadvantaged environments have been the focus of great interest and research. Deutsch (1966a), Jensen (1966) and others talk of a cumulative deficit wherein children from culturally disadvantaged environments fall further and further behind in school and eventually drop out. Deutsch has suggested the use of preschool experience as a cultural bridge between the home and school. Jensen agrees by suggesting that the best way to decrease the cumulative deficit is to combat it as close to its source as possible, in the preschool years. These proposals have been generally accepted and the Head Start programs and much research concerned with the effectiveness of these preschool programs have been initiated.

Many research studies have indicated the success of these preschool programs; however, some findings show little or no change resulting from preschool attendance. For example, Jones, Terrel and DeSchiolds (1967) tested 60 children from five preschool centers in Washington, D.C. The mean initial IQ before preschool attendance was 96.3. The mean IQ on the retest seven months later was 99.6. The gain was not statistically significant. Second, Jones (1966) in a study of language development of children who attended a summer Head Start program found no significant differences between gains of Head Start attenders and non-attenders.

Third, Douglas and Ross (1964) in a longitudinal study found some positive gains from attendance at Local Authority Nursery Schools or classes. At the age of eight the nursery school group made slightly higher scores in tests of ability and school performance than children who waited until age five to attend school. Between ages of eight and eleven the nursery school children lost their initial advantage in measured ability and by fifteen they did slightly less well than expected. However, in no year of testing were the differences statistically significant. Finally, Hyman and Kliman (1966) compared children who had attended Head Start one or two summers and kindergarten with children who had not had Head Start on the Metropolitan Readiness Test. The experimental group did better, but not significantly so. The authors conclude that, "The results of this study indicate that despite initial gains as a result of Head Start, the children described are still disadvantaged in terms of academic readiness when they enter the first grade." (Hyman and Kliman, 1966, p. 167)

Powledge (1967) reports on the progress of the preschool programs at the Institute for Developmental Studies. The overall conclusion is that the intervention program is making a positive difference in the lives of the experimental group. But Deutsch, the director of the Institute, as contained in Powledge, questions whether or not the program is working sufficiently. Each year the group who has received the enriched program did significantly better on the Illinois Test of Psycholinguistic Abilities. However, this advantage seemed to disappear somewhat with only a weak treatment effect being noted in the second year. Also two other groups who had some education (although not the enriched program) prior to first grade increased on the tests and the means

between the three groups were not significantly different. However, the group who first attended school in the first grade did significantly poorer than the other three groups on the tests. Also the group who had received the enriched program did significantly better than the control group on the Gates MacGintie Vocabulary Test at the end of first grade. This shows some longitudinal gain.

Gray et al. (1966) report significant gains in IQ which have been maintained over two-and-one-half years. In their Early Training Project the group who had attended three summer schools and had weekly home contacts for three winters had maintained an average increase in IQ of 9 points when tested at the time of school entrance into the first grade. The group who had had two summer schools and two winters of home contacts had an average gain in IQ of 5 points. The local controls who had had no summer schools had lost 3 IQ points and the distant controls had had a loss of 6 IQ points. These differences were significant at the .05 level.

Nimnicht's program, as contained in Cracraft (1967) with the New Nursery School in Greeley, Colorado, also seems to be having success. In this program Spanish American disadvantaged children attend preschool for two years before kindergarten. This program is a combination of the theories of Montessori, Deutsch, and Moore and is based on the idea that the child is to discover the satisfaction of learning. Test results on standardized tests have not been published; however, almost all of the children were ranked in the upper half of their classes when kindergarten teachers were asked to predict the success of their students

in the first grade. The teachers did not know which children had been to the New Nursery School and there were children from all social-economic levels in the classrooms.

The programs of Bereiter and Engelmann utilizing direct teaching for culturally disadvantaged preschoolers at the University of Illinois has possibly received the most publicity and reports significant gains with their program centered around verbal abilities. According to Pines (1967), in each of two three-month periods children have gained about one year of psycholinguistic ability on the Illinois Test of Psycholinguistic Abilities. Bereiter and Engelmann (1966a) also report that 15 four year old disadvantaged Negro children made a gain of two years on the Illinois Test of Psycholinguistic Abilities in seven months. The mean IQ raised from the low nineties to slightly over 100. Also at the end of nine months the children scored at the second grade level in arithmetic and at the first grade level in reading. Young (1968) reports that children in an Ohio Head Start program who were taught by the Bereiter-Engelmann method did significantly better on the Pre-School Inventory Test and the Concept Inventory Test than did the children who were taught by the conventional Head Start program.

Smilansky (1966), Foster (1967), Sprigle, Van DeRiet and Van DeRiet (1967), and Stearns (1967) also found significant gains in learning when four and five year olds have been exposed to special learning and training programs. Brazziel and Terrell (1962) also report significant success with a six-week readiness program for 26 first grade Negro children.

Recent Theories of Learning

Two of the above research programs have also attempted to focus their ideas of teaching methods on middle class children (Pines, 1967; Cracraft, 1967). The directors of both programs (Bereiter and Engelmann, and Nimnicht and Meier) report that the middle class children learned well with the methods devised for the lower class disadvantaged children and that they moved through the programs more quickly than did the disadvantaged children. It is interesting to note that the methods used in these two schools are very different--one based on the child discovering learning and one based on direct teaching. Moore's program, as reported by Moore and Anderson, (1968) with the talking typewriter also has shown that middle class preschoolers readily learn reading and other skills heretofore taught only in elementary school.

The type of findings reported above coupled with findings in animal learning studies and other writings have led to a change in the generally accepted learning theory. Intelligence is no longer accepted as being fixed or that development is predetermined. Hunt (1961), Bloom (1964), Bruner in Bruner et al. (1966) and Fowler (1962, 1968) are the leaders of this new theory of learning. They emphasize the great importance of learning in the preschool years in laying the foundation of intellectual curiosity and to a great extent determining the individual's intellectual capacities for life. Fowler (1962, 1968) surveyed studies in early childhood learning in the areas of simple abilities, motor abilities, verbal memory, language, conceptual processes and IQ, special cognitive processes (reading, math, music, etc.) and psychosocial development. He states, "In no instance (where documentation exists) have I found any individual of high ability who did not

experience intensive early stimulation as a central component of his development." (Fowler, 1968, p. 17)

McVicker Hunt (1961) refutes the theories that intelligence is fixed, development is predetermined and that the brain is static. He proposes that there is a hierarchical arrangement of the central processes of the brain and that the rate of development depends on the nature of the child's encounters with the environment. He also suggests that the effects of early experience are irreversible.

Bloom (1964), from his survey of research, states that intelligence is a developing function, and that variations in the environment have the greatest effect on the development of intelligence during its most rapid period of change and least effect during the least rapid period of change. The most rapid period of change is between conception and age four with 50 percent of the development of intelligence taking place during this period.

Jensen (1966) succinctly summarizes learning theory as it is now accepted by many educators and psychologists. He states:

All learning beyond the first few weeks or months of life depends upon previous learning. Knowledge and ability develop in a hierarchical fashion; the development of each new level is facilitated by transfer from earlier learning. More complex forms of learning build on simpler forms of learning. When the habits, skills or cognitive structures that are prerequisite for some "new" learning have not been fully acquired, the capacity for the new learning will be impaired: learning will be retarded, inefficient, incomplete, or even impossible, depending upon the degree of inadequacy of prerequisite skills. (Jensen, 1966, p. 40-41)

### Summary

In this review of literature it has been demonstrated that no clear-cut findings have been found showing a positive relationship between preschool attendance and improved intelligence or social development. In the area of intelligence the Iowa and Merrill-Palmer studies have shown that there was a positive relationship between preschool attendance and intelligence. However, at other institutions little or no relationship has been found. In the area of preschool attendance and social development all types of findings have been reported, ranging from a distinct advantage in social development for the preschool attenders to an advantage for the nonattenders. In fact for a number of years this type of research was generally discontinued with experts in the field believing that these questions of what preschool attendance does for future development were not necessarily relevant. Preschool experience has generally been accepted as a valuable experience for what it does for the child at the time he is attending.

The writings of Fowler (1962, 1968), Hunt (1961), Jensen (1966), Bruner in Bruner et al. (1966), and Bloom (1964) and others have again revived the question of the importance of the preschool years as a time for cognitive learning. Thoughtful statements, such as the following by Fowler and Hunt have caused psychologists and educators to wonder and reevaluate their positions on this issue. Fowler (1962, p. 145) stated, "In harking constantly to the dangers of premature cognitive training the image of the 'happy' socially adjusted child has tended to expunge the image of the thoughtful and intellectually educated child." McV. Hunt (1961) concluded that in our society with its demands for

capable, intelligent people it is not unreasonable to look for ways to govern the encounters that children have with the environment in order to maximize development and future adult capacity.

Also the findings in the research with children from culturally disadvantaged environments, while not entirely in agreement, raise the question of the advantageous use of the preschool years for cognitive learning. In these studies various methods are being tried. Bereiter and Engelmann (1966b) use a method of direct teaching and rote learning. Nimnicht, as contained in Cracraft (1967), uses a method of the child discovering on his own with indirect involvement of the teacher. Smilansky (1966) has found success using the methods of (a) active guidance by the teacher in discovering the underlying principles of the task in hand, (b) guidance in the performance of the task with the aid of a clear frame of reference and (c) verbal control of the task performance instead of the method of general instruction usually used by kindergarten teachers. Little research has been done in trying out these methods with middle class children. University nursery schools are a logical place to conduct such research.

Various research (Wellman, 1938, Starkweather and Roberts, 1940, Skeels et al., 1938) has shown an inverse relationship between the increase in IQ and the initial IQ before the preschool experience with the ones with lower IQ gaining more than those with higher IQ. Possibly these children from upper, middle class homes are receiving enough stimulation and the right kinds of experiences in their homes to encourage cognitive growth, and enriched preschools won't make a difference. Research in university nursery schools can give valuable information in answering this question.



There is also a scarcity of studies which look at the effect of the preschool experience on an immediately subsequent school experience (kindergarten). Most of the research has been done at later grade levels or during the final months of the nursery school.

Therefore, this research project has been addressed to the evaluation of how much, if any, does attendance at a typical university nursery school affect a child's school performance and readiness in an immediately subsequent situation. This question of the present status needs to be answered before more research and decisions on programs can be considered.

## PROCEDURE

### Definition of Terms

Readiness--Readiness is operationally defined for this study as that score attained on the Metropolitan Readiness Test.

Nursery school--This term refers to schooling prior to kindergarten.

Preschool--This term refers to any schooling prior to first grade--either nursery school and/or kindergarten.

### Selection of Sample

The sample was composed of two groups--an experimental group who had been nursery school attenders and a control groups who had not attended any school prior to kindergarten. The sample was chosen from children attending kindergarten in the Edith Bowen, Hillcrest and Riverside Elementary Schools in Logan, Utah, during the school year of 1967-1968. All of the children had attended kindergarten for eight months. Various criteria were used to help insure the normality of the sample and to rule out variables which might affect the matching of the two groups. Therefore, those repeating kindergarten and those who had lived in foreign countries for the three previous years or did not use English as the primary language were excluded from the sample. All the children in the sample were living in intact family situations. Those living with only the mother or father were excluded. The teachers were also questioned to determine if any in the sample had

hearing problems, other defects or other problems which would warrant their exclusion from the sample.

A questionnaire and cover letter (See Appendixes A and B.) were sent home with all (139) of the kindergarten children in the three schools. Three questionnaires from parents who had children eligible for the sample were not returned. The rest of the questionnaires were checked against the Utah State University Child Development Laboratory enrollment records to check for attendance at nursery school.

The criteria for the experimental group (nursery school attenders) were, as follows: (1) to have attended the Utah State University Child Development Laboratory at least two and not more than three quarters, (2) to have at least half of the nursery school experience during the year prior to attending kindergarten, (3) to have attended the regular four day a week nursery school and not the two day a week nursery school, and (4) to not have attended other university or private nursery schools or day-care centers. Twenty-one children (13 boys and 8 girls) fit the criteria for the experimental group.

The philosophy of the Child Development Laboratory at Utah State University, as stated in the *Handbook for Parents* (n.d.) is as follows:

A place where the child can make his own discoveries and solve many of his own problems, whether the problems involve construction of a design with blocks, covering one's arm with fingerpaints, seeing the results of colors mixed together, beginning to establish relationships with his peers, or learning to accept restraints on his behavior.

A place where the child encounters other human needs, desires and ideas besides his own, and where he learns to live with others.

In brief, we see the nursery school as a place where the child is allowed to be a child, and to continue his discovery of himself through experiences with materials, other children, and his teachers. (n.p.)

The Child Development Laboratory consists of three playrooms with a common outdoor play area. Each room accommodates one group of 15 to 20 children in the morning and one group of 15 to 20 children in the afternoon. The children attend nursery school for two and one-half hours a day for four days a week, Monday through Thursday. Each group of 15 to 20 has a head teacher who is on the staff in the Family and Child Development Department and four student teachers who are in their junior or senior year and have a major or minor in Child Development. An exception to this rule is that one head teacher may be a graduate student on a full-time assistantship.

Twenty-one children (13 boys and 8 girls) were selected for the control group (nursery school non-attenders). The criteria for their selection were, as follows: (1) not to have attended any nursery school or day-care center and (2) to match the subjects in the experimental group on age, sex, kindergarten teacher and socio-economic level of the father as determined by the Short Form of the McGuire-White Index of Social Status (1955).

#### Description of Instruments

##### Questionnaire and Cover Letter

The purpose of the questionnaire was three-fold: (1) to aid in the selection of the sample, (2) to match the experimental and control groups and (3) to provide information to test the secondary hypothesis. The cover letter was used to encourage cooperation from the parents. It explained that the information would be kept confidential and that the children would not be studied individually.

### Metropolitan Readiness Test

Form A (1964) of the Metropolitan Readiness Tests (Hildreth, Griffiths and McGauvran, 1964) was used to assess school readiness. This instrument included six sub-tests: (1) word meaning, (2) listening, (3) matching, (4) alphabet, (5) numbers and (6) copying.

Test 1, a word meaning test, attempts to measure the child's store of verbal concepts. It is presented as a picture vocabulary test and permits the child to indicate his understanding of oral vocabulary. Test 2 is a listening test which tries to estimate the child's ability to comprehend phrases and sentences. The child listens to a series of statements and then marks the picture which best agrees with the statements made. Test 3 is a matching test which involves discrimination between various symbols and word forms. Test 4 is an alphabet test which tests the child's ability to recognize letters when these are spoken by the examiner. Test 5 tests many types of number concepts--recognition, ability to write numbers, ability to handle amounts and quantitative relationships, etc. Test 6, a copying test, attempts to evaluate the child's visual perception and motor control.

Reliability. Hildreth, Griffiths and McGauvran (1965) report data on the reliability of the sub-tests and total scores. Three samples were used from different school systems. The total score odd-even coefficients for the three samples were .91, .91 and .94. In another project the odd-even reliability coefficients for four samples were .95, .93, .91 and .90 (Testing Department [1968]). Alternate form reliability has

also been reported by Hildreth, Griffiths, McGauvran (1966). In a study in four school systems the reliability coefficients for Form A followed by Form B and Form B followed by Form A were both .91.

Validity. The *Metropolitan Readiness Test, Manual for Directions*, Form A (Hildreth, Griffiths, and McGauvran, 1965) reports congruent validity for the Metropolitan Readiness Test with the Murphy-Durrell Analysis (another readiness test) and with the Pintner-Cunningham Primary Mental Ability Test. The correlation coefficient with the Murphy-Durrell Analysis was .80 and with the Pintner-Cunningham Primary was .76.

The information on the predictive validity of Form A is not all compiled since the 1965 edition is a recent publication. However, various validity studies have been done in Michigan, Mississippi, South Carolina, New York, Wisconsin, Arizona, Minnesota, Missouri and other states. The Metropolitan Readiness Test, Forms A and B have been given during April or May of the kindergarten year, or September or October of the first grade year. The criterion tests used have been the Metropolitan Achievement Tests, Primary I or the Stanford Achievement Test. These have been administered during April or May of the first grade. The correlations for the total test score on the Metropolitan Readiness Test with the sub-test scores on the criterion tests range from the low forties to eighty-one, with the majority being in the low sixties. (Testing Department [1968]). Mayans (1967) administered four predictive tests during the kindergarten year. They were the Metropolitan Readiness Test, Peabody Picture Vocabulary Test, Binet Vocabulary List and a teacher rating scale. Two years later in May the Gates Primary Reading Test was administered. The Metropolitan

Readiness Test yielded the highest correlation with the Gates Test and was evaluated as the best predictor.

#### Administration of the Instrument

The questionnaire and cover letter were sent to the parents in March, 1968. The Metropolitan Readiness Test was given to all subjects during a three week period (the last week of April and the first two weeks of May). The investigator administered all the tests. The children were tested in groups of ten or less.

The schools provided a spare room for the testing. In two of the schools the area used was part of the lunch room. At the Edith Bowen School the area was part of the lunch room eating area, but also when curtained off served as the stage for the auditorium. During the testing periods no one was using the rest of the eating area or auditorium; therefore, there was no problem of noise and distraction. At the Hillcrest School the testing area was the stage of the lunch room, auditorium combination. During the testing period the stage curtains were drawn and no one was using the other part of the auditorium. At Hillcrest the testing had to be moved into the library for the last five minutes of one afternoon testing session because the older grades came in for an assembly. At Riverside School a combination supply room and office was used for the testing. No one else was present during the testing although the phone rang twice during the testing periods.

The size of the tables used varied from long lunch room type tables to small tables within each school. The children sat at the table they desired, but no more than three children (four in one case on the long lunch room table) sat at any one table. Their view of

each other's test booklets was blocked off by the use of large books. This was explained as a method of giving each of them his own private desk. It was made to seem like a privilege to go with the examiner to take the tests. All of the children seemed eager to participate. In fact the other children in the classrooms who were not in the sample were disappointed in not being able to take part.

The instructions for administering the Metropolitan Readiness Test were strictly followed. The test was given in three sessions (within a span of four or five days) with Tests 1 and 2 being given in the first session, Tests 3 and 4 in the second session and Tests 5 and 6 in the third session. A brief rest period was provided in each session between the two tests according to the directions in the test manual. One or two finger plays and/or activity songs were used for these rest periods along with one or two minutes of supervised standing or stretching. The procedure and activities used for the rest periods were the same for all three schools. The children used their own crayons for marking the test booklets which was one of the methods suggested by the manual of directions for Form A. It was felt by the investigator that the scores for Test 6 (copying) would have been higher if smaller, sharper crayons or pencils had been used instead of the blunt, large crayons. If a child lifted his crayon it was difficult to put it back on the same spot on the paper because of its blunt, rounded end.

The optional test (Draw-a-Man) was used after Test 6 only as an activity to keep them busy until the allotted time for Test 6 had passed and while others finished Test 6. It was not scored.



Analysis of Data

Sandler's A (Runyon and Haber, 1967), a simplified procedure for arriving at probability values for which the t-ratio for matched pairs is used, was used to test the first null hypothesis. The raw scores on the readiness test were used for this computation. Chi square tests of independence were used to test for independence between performance on the test and the variables stated in the second hypothesis. The .05 level of significance was utilized as the critical level for both hypotheses.

## RESULTS

### Description of Sample

The sample for this study consisted of 40 children from three elementary schools in Logan, Utah, who attended kindergarten during the school year of 1967-68. There were 20 children in the experimental group (nursery school attenders) and 20 children in the control group (nursery school non-attenders). These two groups were matched on sex, age, kindergarten teacher and socio-economic level of father.

#### Sex

There were eight girls and 12 boys in the experimental group and the same number were also in the control group. Therefore, the sample included a total of 16 girls and 24 boys.

#### Age

The mean age of the experimental group was 5 years 11 months and the mean age of the control group was 5 years 11 1/2 months. When the group was divided according to sex the boys' mean age for both the experimental and control groups was six years. For the girls the mean age for the nursery attenders was 5 years 10 months and for the non-attenders was 5 years 11 months. (See Table 1 for age differences between pairs.)

#### Kindergarten teacher

Eighteen pairs were matched on the variable of kindergarten teacher. Two pairs were not matched because it was felt that it was more important to keep the variables of age, sex and socio-economic level of the

Table 1. Ages of subjects in experimental and control groups

Pair number <sup>a</sup>	Nursery school attenders	Non-attenders	Difference
1	5-10 <sup>b</sup>	5-11	-1
2	6- 3	6- 4	-1
3	5- 7	5- 8	-1
5	5- 8	5- 9	-1
6	6- 1	6	1
7	6- 5	6- 5	0
8	5- 9	5- 8	1
9	5- 9	5-10	-1
10	6- 3	6- 1	2
11	6- 4	6- 4	0
12	5- 8	5- 7	1
13	6- 2	6- 1	1
14	6- 3	6- 3	0
15	5-10	5-10	0
16	5- 7	5- 9	-2
17	6- 1	6- 2	-1
18	5- 8	5-11	-3
19	5- 8	5- 8	0
20	5- 8	5- 8	0
21	5- 9	5-10	-1
Mean age	5-11	5-11 1/2	-1/2

<sup>a</sup>pairs 1 to 13 are boys and 14 through 21 are girls.

<sup>b</sup>The first number refers to years and the second number to months.

father matched than it was to keep the teachers matched. The same two teachers were involved in both instances of non-matching. Since each teacher had one child who scored higher than his partner, this non-matching did not seem to affect the variation.

#### Socio-economic level of fathers

The score from the McGuire-White Index of Social Status, Short Form, is based on three items, which are as follows: (1) father's education, (2) description of father's employment, and (3) major source

of father's income. Within each of these classifications each level is given a numerical value. These numerical values are multiplied by weighted numbers. These weighted numbers are three for father's education, four for major source of income and five for type of employment. Therefore, the type of employment is the greatest determining factor in this scale. The sum of these three items is the social index score for each subject.

The subjects were a homogeneous group as far as the socio-economic level of the father was concerned. As the following information shows, they were from the upper middle class. First, in the area of education 27 of the fathers have completed graduate study (Scale does not differentiate between masters and doctoral programs.), ten have completed their bachelor's degree, and three have completed one to three years of college. Secondly, from the description of father's employment 23 of the fathers were doctors, dentists or teach at Utah State University, four were graduate students, two were undergraduate students, four were teachers in public schools and seven had other occupations. These occupations included certified public accountant, sales manager, store manager, etc. Thirdly, 39 of the fathers' major source of income came from salary or commissions (regular--monthly or yearly) which is classification four. One father, a student, checked that his major source of income was from seasonal work which is in classification six.

The mean score on the McGuire-White Index of Social Status was 28.08 for the experimental group and 28.33 for the control group. Within each sex this similarity of the mean score is also reflected. For the boys the mean score for the nursery attenders was 28.16 and for the nursery non-attenders was 27.75. For the girls the mean

score was 28 for the nursery attenders and 28.9 for the non-attenders. The reader is referred to Table 2 for the differences between the subjects in each pair as reflected by fathers' social index scores.

Table 2. McGuire-White social index scores for experimental and control groups

Pair Number <sup>a</sup>	Nursery school attenders	Non-attenders	Difference
1	29	24	5
2	37	24	13
3	24	24	0
5	32	32	0
6	24	24	0
7	24	24	0
8	24	24	0
9	24	24	0
10	32	40	-8
11	24	24	0
12	27	29	-2
13	37	40	-3
14	24	24	0
15	24	29	-5
16	24	24	0
17	24	29	-5
18	48	37	11
19	24	24	0
20	24	32	-6
21	32	32	0
Mean Score	28.08	28.16	.08

<sup>a</sup>Pairs 1 through 13 are boys and 14 through 21 are girls.

To summarize, the matching was judged to be adequate for the purposes of this study. It is interesting to note that the experimental and control groups are also similar on the variables of mother's education, mother working outside of home, number of children in family and birth order position, which are listed in the second hypothesis. See Table 3 for the comparison of these characteristics.

Table 3. Other characteristics of subjects

Characteristics	Nursery-attenders	Non-attenders
<u>Mother's education</u>		
High school diploma	4	5
1-3 years of college	10	6
Bachelor's degree	5	7
Graduate work	1	2
<u>Mother working outside of home</u>		
None	14	11
Part-time	4	7
Full-time	2	2
<u>Number of children in family</u>		
1	1	0
2	3	5
3	9	5
4 or more	7	10
<u>Birth order<sup>a</sup></u>		
First born	2	5
Second born	8	4
Third or later born	9	11

<sup>a</sup>The one subject who was an only child was not included in this classification.

During the testing situation one subject behaved differently from the rest of the children. His behavior (staring around the room, seldom looking at his test booklet, sporadic marking of the test booklet, etc.) was such that the investigator determined that this performance in the testing situation was not typical and the score would not be a valid appraisal of ability. This appraisal was supported by the results of psychological tests which showed this subject had normal ability although his classroom performance showed his inability to work in a school group situation, and made him a candidate for the learning adjustment class. This subject was tested a week later by a

psychologist, upon referral by his teacher, and the investigator had access to these test results and records. Therefore, this subject and his partner (pair #4) were dropped from the sample and therefore do not appear in any subsequent table in the text, leaving a total of twenty pairs. Appendix C shows the scores of this subject and his partner in comparison with the rest of the sample.

### Hypotheses Tested

#### Hypothesis 1

There is no significant difference in performance on a readiness test in kindergarten between children who have attended nursery school and children who have not attended nursery school. In preparation for the statistical analysis the readiness tests were scored by the investigator, in accordance with the key provided with the Metropolitan Readiness Tests. Test 6, the only sub-test which involves personal judgment in scoring, was also corrected by a second scorer. The items the two scorers did not agree upon were alternately determined correct or incorrect. For example, if two items were disagreed upon by the two scorers the first item would be counted correct and the second item incorrect. A third person checked every fifth test booklet as a check on the validity of the scoring. No errors were found.

Sandler's A test was then applied to the raw scores on the Metropolitan Readiness Test to see if the differences between the pair performance on the test were statistically significant. The A score was .234 which was significant at the .05 level in favor of the nursery school attenders (Table 4). Therefore, the null hypothesis must be rejected.

Table 4. Comparison of performance on Metropolitan Readiness Test of nursery school and non-nursery school attenders

Pair Number	Nursery school attenders	Non-attender	Difference
1	75 <sup>a</sup>	43	32
2	47	50	-3
3	71	56	15
5	66	71	-5
6	76	76	0
7	85	51	34
8	66	74	-8
9	69	46	23
10	67	63	4
11	80	68	12
12	74	58	16
13	65	54	11
14	72	50	22
15	78	73	5
16	53	67	-14
17	64	73	-9
18	62	41	21
19	73	57	16
20	71	67	4
21	61	83	-22
	Number 20		
	Degrees of freedom 19	A = .234*	

\*Significant at .05 level.

<sup>a</sup>Raw scores.

In trying to evaluate this test result the group was divided according to the sexes. As shown in Table 5 the A score for the 12 pairs of boys was .131, which was significant at the .01 level.

Therefore, the null hypothesis for the 12 pair of boys must also be rejected. However, in testing the null hypothesis for the eight pair of girls, the A score was 3.7, which was not significant at the .05 level. Therefore, the null hypothesis must be held tenable for the girls in the sample, although the girls who had attended nursery school tended to score higher than the girls who had not attended nursery school.



Table 5. Comparison of performance on Metropolitan Readiness Test of boy nursery school and non-nursery school attenders

Pair number	Nursery school attender	Non-attender	Difference
1	75 <sup>a</sup>	43	32
2	47	50	- 3
3	71	56	15
5	66	71	- 5
6	76	76	0
7	85	51	34
8	66	74	- 8
9	69	46	23
10	67	63	4
11	80	68	12
12	74	58	16
13	65	54	11
Number 12			
Degrees of freedom 19		A = .131*	

\*Significant at .01 level.

<sup>a</sup>Raw scores.

The findings can be summarized as follows. The children who attended nursery school did significantly better on the Metropolitan Readiness Test than their matched partners who had not attended nursery school. However, the difference between the scores of the boys was the major factor in the rejection of the null hypothesis in favor of the nursery attenders. The boys who attended nursery school did significantly better on the Metropolitan Readiness Test than their matched partners who had not attended nursery school. The girls who attended nursery school tended to do better than their matched partners, but the difference between the groups was not statistically significant.

Although measures of range and central tendency are not as meaningful as they would be if the sample was a randomized sample, it is still interesting to note how the group did as a whole and how they

varied between the experimental and control group. The mean raw score for the total group on the Metropolitan Readiness Test was 64.9 which is at the seventy-first percentile or in the high normal group according to the letter rating classification. The experimental group raw scores range from 85 to 47 and the control group scores range from 83 to 41. The mean for the experimental group is 68.75 and the mean for the control group is 61.05. As can be seen in Table 6 the greatest difference between the two groups is in the lower scores. In the experimental group there is only one score in the fifties while there are seven scores in the fifties in the control group.

Table 6. Range and central tendency for the nursery school attenders and non-attenders

	Nursery school attenders		Non-attenders	
	85		83	
	80		76	
	78		74	
	76		73	
	76		73	
	74		71	
	73		68	
	72		67	
	71		67	
	71		63	
	69		58	
	67		57	
	66		56	
	66		54	
	65		51	
	64		50	
	62		50	
	61		46	
	53		43	
	47		41	
	Range	85-47	Range	83-41
	Mean	68.75	Mean	61.05
	Median	70	Median	60.5

## Hypothesis 2

Readiness is not significantly related to any of the following variables: (a) mother's education, (b) mother working outside of home, (c) number of children in the family, (d) birth order position.

For the chi square tests the population was divided at the raw score of 64 with those scoring 64 or higher being in one group and those scoring 63 or lower in the other group. The rationale behind this division is that it correlated with the classification system of readiness status outlined in the manual of directions for Form A of the Metropolitan Readiness Test (76 and above--superior, 64-76--high normal, 45-63--average, 24-44--low normal, 24 and below--low), and was similar to the mean score of the total group which was 64.9.

Using the chi square test of independence none of the variables were found to be significantly related to readiness; therefore, the null hypothesis must be held tenable. In fact, since the chi square values were so small not even any trends were observable. However, the descriptive data are interesting because they demonstrate the homogeneity of the experimental and control groups as far as these variables are concerned.

Mother's education. In the total group nine of the group had finished high school while 31 of the group had some college education. Of this group 16 had one to three years of college, 12 had received bachelor's degrees and three had done some graduate work. The chi square value was 2.892 which was not significant at the .05 level.

Mothers working outside of home. The majority (25) of the mothers were not presently working outside of the home. Eleven were

doing part-time work although two of these said this involved only a few hours a week and one was a part-time student. Only four worked outside of the home full-time. In this chi square the frequency observed was never more than .6 from the frequency expected; therefore, employment outside of the home was not related to readiness.

Number of children in the family. Two chi square tests of independence were employed for this variable because the average size of families in Utah is greater than the national norm. In the first test the group was divided into families of two or less and three or more. According to this categorization nine came from small families and 31 from large families. By dividing the group into categories of three or less and four or more, 23 came from smaller families and 17 from larger families. As was stated before, neither of these reached the level of significance. Therefore, the null hypothesis was held tenable; readiness was not related to family size.

Birth order. In this study one child was an only child; seven were first born children; 32 were later born. This variable was included because the investigator had observed that at this age level the second or third child is often supplied with a great deal of information by his siblings who are a year or two older. However, as was stated above, the birth order was not found to be related to readiness.

## SUMMARY AND CONCLUSIONS

### Summary

The purpose of this study was to assess the readiness of a group of kindergarten attenders to see if those who had attended nursery school at the Utah State University Child Development Laboratory differed in readiness from those who had not attended any type of nursery school. This project was considered to be pertinent because of the present day interest in early childhood learning which asks the following questions: (1) What types of experiences are important in early childhood to stimulate intellectual growth and interest? (2) Is cognitive learning in early childhood beneficial? (3) How do various activities affect future performance and capacities? Not only has this question of early childhood learning been brought to the foreground by theorists such as Hunt (1961), Bruner (1966), and Fowler (1962) and by research with disadvantaged children in various nursery school experiences, but in addition, the findings in the early research in this area were contradictory and left the question unanswered. To further the research in the area of early childhood learning it is pertinent to know what effect, if any, a typical university nursery school has on readiness and performance in an immediately subsequent school experience.

For this study 40 kindergarten children from three elementary schools in Logan, Utah, were studied. Twenty of these had attended nursery school at the Utah State University Child Development Laboratory for at least two but not more than three quarters, with at least half

of this nursery school experience being during the year preceding kindergarten. The control group also consisted of 20 children. These children had no nursery school experience of any type. The two groups were matched by pairs on the variables of age, sex, kindergarten teacher and socio-economic level of the father. The information for the matching was furnished by questionnaires sent to the families. The final sample consisted of twelve matched pairs of boys and eight matched pairs of girls.

The instrument used to ascertain readiness was the Metropolitan Readiness Test, 1964 edition, Form A. This readiness test was administered by the investigator to groups of ten or fewer according to the procedure outlined in the manual of directions. The tests were administered during a four or five day interval during the last week of April and the first weeks of May, 1968. The reliability and validity of this nationally standardized instrument have been reported by Hildreth, Griffiths and McGauvran (1965, 1966).

The null hypothesis which states that there would be no significant difference between the nursery and non-nursery attenders was rejected in favor of the preschool attenders. When the raw scores of the Metropolitan Readiness Test were subjected to Sandler's A test, the A score was .237 which was significant at the .05 level. Therefore, with the total sample, readiness was significantly related to attendance at nursery school. In evaluating this result the sample was divided by sex and the A test was applied to the 12 pair of boys and the eight pairs of girls separately. The A score for the boys was significant at the .01 level; therefore the boys who had attended nursery school did significantly better on the Metropolitan Readiness Test than did the

boys who were non-attenders. The girls who had been nursery attenders tended to score higher on the Metropolitan Readiness test than the girl non-attenders did, but the A score did not reach the .05 level of significance. Therefore, for the girls the null hypothesis must be held tenable.

The second null hypothesis which stated that there was no significant relationship between readiness and the variables of mother's education, mother working outside of home, number of children in the family and birth order position was held tenable because none of the chi square values reached the .05 level of significance. Therefore, none of these variables were shown to be statistically related to readiness.

#### Conclusions and Discussion

From the rejection of the major null hypothesis it can be concluded that there is a positive relationship between attendance at the Utah State University nursery school and readiness as it is shown by performance on the Metropolitan Readiness Test. This finding agrees with the findings of Wellman (1932, 1934, 1938, 1940, 1943) and her associates at the Iowa Child Welfare Research Station and with Starkweather and Roberts (1940) at the Merrill-Palmer Institute. These findings also generally agree with the findings of Deutsch, as contained in Powledge (1967), Gray and Klaus (1965, 1968), and others who have done research with "disadvantaged" children. The intervention of a nursery school can make a positive difference to "advantaged" as well as to "disadvantaged" children.

However, because of the many contradictory findings in research in this area this relationship must be held as tentative and the factors involved need to be investigated. The existence of so many contradictory findings itself suggests that the important variable may be the type of program the nursery school provides. Two studies, Smilansky (1966) and Young (1968), compared methods of teaching and found that certain methods brought about more significant gains than did other methods. Certainly it can be agreed that just any supervised group experience for young children will not automatically upgrade their later academic performance. Another variable which must be considered is the social development--does the year of social adjustment make a difference in performance in later school work. A third variable may be the learning of the routine (learning to listen and speak in a group situation, following instructions, relationship with an adult as a teacher, etc.) of school type situations.

Not only should these above variables be considered, but also the variables of parental attitude and family life style should be assessed. Do parents who send their children to nursery school for an enriching experience also provide significantly more enriching activities at home? Although these groups were matched on socio-economic level of the father, this matching does not tap these parental attitudes. More discussion concerning matching will be continued below. The questionnaire included one question designed to give some information concerning parental attitude toward nursery schools. However, the answers received only demonstrate the complexity of parental attitudes.

This research also agrees with the studies of Bereiter and Engelmann as contained in Pines (1967), and Nimnicht as contained in



Cracraft (1967). That is, the findings suggest that upper middle class children do benefit from a program that emphasizes learning experiences and language development.

The factor of sex differences was an unexpected, but interesting, finding. The fact that the boys who attended nursery school did significantly better on the readiness test than did the boys who were non-attenders, while the girls who were nursery attenders only tended to do better than their matched partners suggest that attendance at nursery school affects readiness for the boys more than it does the girls. This difference raises many questions as to the reasons for this difference. Various studies have shown that more boys in school are referred for reading problems than girls. Bentzen (1963) reports that in a Maryland study slightly more than two-thirds of those referred for reading problems were boys. Also more than two-thirds of those retained in school are boys. Secondly, Walters, Pearce, and Dahns (1957) and Bandura, Ross and Ross (1961) report that boys are more physically aggressive than girls. Yarrow, as reported in Honzig (1951) states that in nursery school groups boys show a more active and aggressive approach to the materials, while girls show more passive, inhibited and socially conforming behavior. Also the types of activities (quiet activities, drawing, paper and pencil games, etc.) done in school are often viewed as more feminine than masculine. Therefore, it might be assumed that school in the primary grades is more of an adjustment for boys than it is for girls. Maybe the fact that the male nursery school attenders having had one more year of school type experiences, made the kindergarten year less of an adjustment and more of a learning experience.

Another factor which may be pertinent is the developmental age differential between boys and girls. Bentzen (1963) reports that at age six girls are approximately 12 months ahead of boys in developmental age and that by nine years of age the difference is approximately 18 months in favor of the girls. Possibly the age at which a child has a nursery school experience makes a difference. According to Bloom (1964), the greatest change can be made by the environment during the periods of greatest growth.

Future studies which are recommended by the investigator include the following: (1) studies comparing types of cognitive stimulation given and methods used in nursery schools, (2) studies investigating the effect of the variables of parental attitudes and number and type of intellectually stimulating experiences provided in the home and (3) studies investigating the variable of sex. This study also lends itself as a base line study for further comparative studies in university nursery schools. As Deutsch (1966b) suggests there has been a protective movement in child development, i.e. the child should be protected from stress and emotional conflict. This has led to an emphasis on protection and a resulting de-emphasis on stimulation of development. The Utah State University as well as most university nursery schools have not emphasized cognitive stimulation in the past. This study was done at a time when the emphasis was changing to one of more intellectual stimulation and language development. Although some diffusion effect from the head teachers working with Head Start programs may be expected to have been present in the nursery school program during the years 1966 and 1967 when the experimental group attended nursery school,

there certainly was not the emphasis on cognition that there presently is or that there will probably be in the future.

A major limitation in this study is in the area of matching--i.e. the factors of (1) intelligence and (2) individual differences, parental attitudes and types of home activities provided. On the first factor, intelligence, matching was not possible. It was not thought feasible to match the children on an intelligence test administered at the same time the readiness test was given because of the possibility of the nursery school experience already having had an effect on intelligence as was found in the research of Wellman (1943) and Startkweather and Roberts (1940). Equitable matching on intelligence would have required that all subjects be tested with an intelligence test before the nursery school experience when the subjects were four years of age. This matching was not within the scope of this research.

Secondly, although the groups were well matched on the variables of age, sex, and socio-economic level of the fathers these variables may be too general and not sensitive enough. As mentioned above, factors such as parental attitudes toward education, number and type of intellectually stimulating experiences provided, and individual learning styles were not tapped. Fowler had the following to say concerning this issue:

Nursery school and related training experience as marked by social indices such as amount of formal education, number of siblings, ethnic background, foster home placement, etc. are too global with respect to the specific types and extent of intellectual stimulation a child is exposed to. (Fowler, 1968, p. 11)

Goldberg (1966) agrees by stating that the varying characteristics of the children involved are usually not identified.

Another variable which was not controlled to any extent is the intervening time--the eight months of kindergarten. It might have been better to test the children both at the beginning and end of kindergarten to see how much effect this intervening time had on the readiness scores of the children.

Therefore, in summarizing this study it can be said that a positive relationship between readiness and nursery school experience has been shown, particularly for the boys. However, the variables involved in this relationship, such as type and content of the nursery school program, individual differences in children and family life styles and activities need more intensive study coupled with tighter controls over the factors involved.

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## APPENDIXES

Appendix A

Kindergarten Survey

Please fill out the following questionnaire and return it in the enclosed, stamped, addressed envelope.

- a. Name of kindergarten child \_\_\_\_\_
- b. Address \_\_\_\_\_ Phone \_\_\_\_\_
- c. Date of child's birth \_\_\_\_\_ Sex of child \_\_\_\_\_
- d. Age and sex of other children in family:
- |                  |                   |
|------------------|-------------------|
| boys _____ (age) | girls _____ (age) |
| _____            | _____             |
| _____            | _____             |
| _____            | _____             |
- e. In school father completed grades:
- none
  - 1-4
  - 5-7
  - 8
  - 9-11
  - 12 or high school graduate
  - 1-3 years of college
  - B.S. or B.A. degree
  - graduate study
- f. In school mother completed grades:
- none
  - 1-4
  - 5-7
  - 8
  - 9-11
  - 12 or high school graduate
  - 1-3 years of college
  - B.S. or B.A. degree
  - graduate study
- g. The main source of income of family is:
- inherited savings and investments
  - earned wealth, transferable investment
  - profits, royalties
  - salary, commissions (regular monthly or yearly)
  - hourly wages, weekly checks
  - odd jobs, seasonal work, private charity
  - public relief or charity

- h. Father's present occupation (work) is: (Describe what he does.)

---

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- i. Does the mother work outside the home?

no  
 part-time  
 full-time

- j. Did your kindergarten child attend a nursery school or day-care center when he or she was three or four?

no  
 nursery school  
 day-care center  
 other

- k. If he (she) did attend one of the above, name or describe: \_\_\_\_\_

---

- l. Location of nursery school or day-care center attended:

\_\_\_\_\_ City  
\_\_\_\_\_ State

- m. Dates of attendance: \_\_\_\_\_ (mo. & year) to \_\_\_\_\_ (mo. & year)

- n. Reasons for attendance or non-attendance at nursery school or day-care center: \_\_\_\_\_

---

- o. Relation of informant to kindergarten child:

father  mother  other, List: \_\_\_\_\_

Appendix BCover Letter

March 15, 1968

Dear Parents,

The attached questionnaire is part of a research project for a master's thesis in the Department of Family and Child Development at Utah State University. It has the approval and backing of the Logan City School District. We would like to encourage your cooperation in answering and returning the attached questionnaire.

All replies will be kept confidential. The information is needed as background information in order to study the group behavior of the children. Behavior or information concerning individual children will not be studied separately.

We thank you for your cooperation and support.

Sincerely,

Glenna Boyce  
Graduate StudentJay D. Schvaneveldt  
Major ProfessorArthur E. Jackson<sup>a</sup>  
Principal

<sup>a</sup>The names of the principals corresponded to the questionnaires and cover letters for the different schools.

Appendix C

Table 7. Comparison of performance on Metropolitan Readiness Test of nursery school and non-nursery school attenders. Pair Number 4 included

Pair number	Nursery school attender	Non-attender	Difference
1	75	43	32
2	47	50	- 3
3	71	56	15
4	19	74	-55
5	66	71	- 5
6	76	76	0
7	85	51	34
8	66	74	- 8
9	69	46	23
10	67	63	4
11	80	68	12
12	74	58	16
13	65	54	11
14	72	50	22
15	78	73	5
16	53	67	-14
17	64	73	- 9
18	62	41	21
19	73	57	16
20	71	67	4
21	61	83	-22

## VITA

Glenna Cooper Boyce

Candidate for the Degree of

Master of Science

Thesis: The effect of nursery school experience upon readiness of children in kindergarten.

Major Field: Family and Child Development

## Biographical Information:

Personal Data: Born at Twin Falls, Idaho, June 30, 1938, daughter of H. Glenn and Olga Berg Cooper; married P. Richard Boyce December 18, 1959; four children--Ann, Shauna, Christopher and Jeffrey.

Education: Attended elementary school in Seattle, Washington and Shelley, Springfield and Aberdeen, Idaho; graduated from Aberdeen High School, Aberdeen, Idaho in 1956; received the Bachelor of Arts degree from Brigham Young University, with a major in sociology and a minor in psychology in 1960; also attended University of Utah and University of Washington; completed requirements for the Master of Science degree, in the field of Family and Child Development, at Utah State University in 1969.

Professional Experience: 1967-1969, research assistant, Utah State University (2 years); 1965-66, operated private nursery school and kindergarten, Sandy, Utah; 1962-65, teacher in Little-Way Preschool, Lynnwood, Washington; 1961-62, substitute teacher, Aberdeen, Idaho; 1960-61, social studies teacher, Orem High School, Orem, Utah; 1959-60, research assistant, Brigham Young University.