R E P O R T R E S U M E S

ED 015 011 PS 000 221

AN EVALUATION OF HEAD START PRESCHOOL ENRICHMENT PROGRAMS AS THEY AFFECT THE INTELLECTUAL ABILITY, THE SOCIAL ADJUSTMENT, AND THE ACHIEVEMENT LEVEL OF FIVE-YEAR-OLD CHILDREN ENROLLED IN LINCOLN, NEBRASKA.

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REPORT NUMBER OEO-543 PUB DATE 67
EDRS PRICE MF-$0.50 HC-$4.12 101P.

DESCRIPTORS- *PROGRAM EVALUATION, *ENRICHMENT PROGRAMS, *PRESCHOOL CHILDREN, CULTURALLY DISADVANTAGED, *COMPARATIVE ANALYSIS, ACHIEVEMENT , MATCHED GROUPS, INTELLIGENCE, SOCIAL ADJUSTMENT, CONTROL GROUPS, PRETESTING, POST TESTING, HEAD START, MERRILL-PALMER PERSONALITY RATING SCALE, PSI, STANFORD BINET, LINCOLN, NEBRASKA,

THREE GROUPS OF DISADVANTAGED CHILDREN WERE ESTABLISHED IN ORDER TO INVESTIGATE THE EFFECT ON ACHIEVEMENT OF PROVIDING SOME CHILDREN WITH A PRESCHOOL PROGRAM AND SOME CHILDREN WITH NO SUCH PROGRAM. AN EXPERIMENTAL GROUP OF HEAD START CHILDREN WERE MATCHED ACCORDING TO SEX, RACE, GENERAL LEVEL OF INTELLIGENCE, AND PARENT'S OCCUPATIONAL LEVEL WITH A CONTROL GROUP OF NON-HEAD START CHILDREN. THE SUBJECTS INVOLVED WERE APPROXIMATELY FOUR TO FIVE YEARS OLD AND ABOUT 200 IN NUMBER. A THIRD NON-MATCHED GROUP OF 41 CHILDREN CONSISTED OF 24 HEAD START SUBJECTS AND 17 NON-HEAD START SUBJECTS. THE TEST RESULTS SHOWED NO SIGNIFICANT DIFFERENCES BETWEEN THE MATCHED GROUPS ON THE VARIABLES OF INCREASE OF INTELLECTUAL ABILITY AND OF LEVEL OF ACHIEVEMENT. ON THE VARIABLE OF SOCIAL ADJUSTMENT, THE HEAD START MATCHED GROUP DID SIGNIFICANTLY BETTER THAN ITS MATCHED NON-HEAD START COUNTERPART ON THE BASIS OF A T-TEST BUT NOT ON THE BASIS OF AN ANALYSIS OF COVARIANCE. THE NON-MATCHED NON-HEAD START GROUP DID SIGNIFICANTLY BETTER ON INCREASE OF INTELLECTUAL ABILITY AND ON LEVEL OF ACHIEVEMENT THAN THE NON-MATCHED HEAD START GROUP, BUT NO OTHER DIFFERENCES WERE FOUND. ALL GROUPS DEMONSTRATED HIGHLY SIGNIFICANT GAINS ON THE VARIABLES ON THE BASIS OF THE WITHIN-GROUP SCORES. (WD)

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Contract No. 543
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ACKNOWLEDGMENTS

The investigators are indebted to many persons for their encouragement, cooperation, and diligent work. Certain individuals and groups of individuals contributed so much to the success and completion of the study that they deserve special notice. They are: the subjects and their parents; Head Start teachers and aides; Dr. R. L. Fredstrom, Assistant Superintendent of Lincoln Public Schools; principals and kindergarten teachers in the elementary schools attended by the subjects; psychological examiners; Dr. Charles O. Neidt, Human Factors Research Laboratory, Colorado State University, for his services as statistical consultant; Dr. Edwin A. Rautio and Dr. Stanley M. Reiss, research assistants; Mrs. Annie Laurie Schapmann, research secretary; members of the family of each of the investigators and Mrs. Suzie Sybouts for her care in the final typing of the manuscript.

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INTRODUCTION

Project Head Start, a federal program designed to prepare the socially and economically deprived children of the United States for school, is based upon the premise that children from low-income homes and neighborhoods are educationally disadvantaged. It is assumed that because of their deprived backgrounds, such children are unable to compete intellectually, socially, and scholastically with their peers from homes and neighborhoods where family incomes are higher. Head Start preschool enrichment programs, launched first during the summer of 1965, emphasized verbal experiences of listening and talking--prerequisites of scholastic success. It was assumed, furthermore, that participants in the preschool enrichment activities would have a "head start" when they entered school. Not only would they demonstrate greater gains intellectually, socially, and scholastically than would children from comparable socio-economic backgrounds without the experiences of Head Start, but also they would be able to compete successfully with children from more privileged backgrounds.

During the summer of 1965, a Project Head Start program was conducted in Lincoln, Nebraska, for a period of eight weeks. The program, financed by a grant to the Lincoln Community Council, was operated by two agencies with whom the Council contracted. The agencies involved were the Department of Human Development and the Family, University of Nebraska, and Save America's Youth (SAY), an organization at Nebraska Wesleyan University, Lincoln, Nebraska.

The Lincoln Head Start program enrolled approximately 390 children in eight centers. The majority of the children were eligible chronologically to enter kindergarten in September, 1965; a few, however, had already attended kindergarten but had not been advanced to the first grade. One Head Start center, housed in the community building in the heart of the largest low-income area of Lincoln, enrolled 120 children. Dr. Wiley Russell, who was at that time Associate Professor of Education at Nebraska Wesleyan University, directed the activities of the center as a representative of SAY. The activities in the other seven centers were under the supervision of Mrs. Mary Petsche, Instructor in Human Development and the Family, University of Nebraska. Located in low-income areas throughout the city, the seven centers served approximately 270 children.

Children, chosen to participate in Head Start activities, came from specific geographic areas of the city which appeared, on the basis of community health surveys and information from local agencies, to be low-income neighborhoods. The Lancaster County Welfare Office cooperated by supplying the names and addresses of all five-year-olds whose names appeared upon the case load of the agency. Elementary school principals also referred many children. Teachers from the Head Start centers visited the homes of five-year-old children in the neighborhood of their respective center, and each teacher based her decisions regarding the enrollment of children upon her observations of the home and of the members of the family. Elementary school principals proved to be helpful to the teachers in determining which children would benefit most likely from Head Start experiences. A

definite level of family income was not specified for enrolling children in the Lincoln Head Start Project. Since 15 per cent of the children enrolled in each center could, at the teacher's discretion, come from homes other than those of low-income, some children were drawn from homes in higher-income brackets.

Lincoln, Nebraska, is a city of 150,000 people who are primarily of Caucasian origin. The non-white population is small and is composed largely of Negroes, a few American Indians, and Mexicans. Lincoln is the site of three universities--Nebraska Wesleyan University, the University of Nebraska, and Union College, supported by the Seventh-Day Adventist Church. Non-whites, other than Negroes and Mexicans, with low incomes are to be found among the graduate students of the colleges but such students cannot rightfully be designated as culturally disadvantaged.

The major low-income area of Lincoln is removed only a few blocks from better-income neighborhoods. Otherwise, low-income families are scattered across the older sections of the city. Some elementary schools tend to have a concentrated enrollment of children from low-income families but no one school has a total enrollment from families of this type.

Wage earners from low-income families find employment in domestic and service occupations, food processing plants, manufacturing plants, and day labor, both in the city and in the surrounding rural areas. Some low-income families in 1965 were military and civilian personnel attached to the Lincoln Air Force Base. (The base was deactivated in June, 1966.)

Housing for low-income families consists primarily of small, single-family dwellings. Some families live in large, older houses which were converted into light-housekeeping rooms or apartments when the original owners or occupants moved into better or newer neighborhoods. Barracks-type housing is adjacent to the air base property. Some student families live here as did some low-income air force personnel. Lincoln has no urban renewal projects and public housing is not available.

Problem

Since a program of preschool enrichment activities for disadvantaged children was a new concept in compensatory education, questions arose regarding the effectiveness of the program in relation to the children's subsequent functioning in kindergarten. Would participants in Head Start activities show demonstrable differences in school readiness in kindergarten when compared to children who had not participated in any type of preschool enrichment program? It has been well established that intelligence test scores and other ability variables play an important part in the prediction of children's academic success. It was decided arbitrarily, therefore, that school readiness could be determined by measuring intellectual ability, social adjustment, and achievement level.

Central objective. The study was designed to investigate whether or not four- and five-year-old children enrolled in eight-week preschool enrichment programs demonstrated significant increments in measured intellectual ability, social adjustment, and achievement

level at the end of their year in kindergarten. To accomplish this objective a control group of non-Head Start children was necessary to furnish the criteria against which increments in intellectual ability, social adjustment, and achievement level could be measured.

Hypotheses. To accomplish the central objective of the study the following null hypotheses were tested:

1. There is no significant increment in the measured general intellectual ability of Head Start children when compared to the measured general intellectual ability of their selected non-Head Start counterparts;

   1-a. There is no measurable significant increment in the Vocabulary subtest scores of Head Start children when compared to the Vocabulary subtest scores of their selected non-Head Start counterparts;

   1-b. There is no measurable significant increment in the total scores of Head Start children upon subtests of psychomotor ability when compared to the total scores of their selected non-Head Start counterparts upon subtests of psychomotor ability;

   1-c. There is no measurable significant increment in the total scores of Head Start children upon subtests of reasoning when compared to the total scores of their selected non-Head Start counterparts upon subtests of reasoning;

2. There is no significant increment in the measured social adjustment of Head Start children when compared to the

measured social adjustment of their selected non-Head Start counterparts;

3. There is no significant increment in the measured level of achievement of Head Start children when compared to the measured level of achievement of their selected non-Head Start counterparts.

Method

Research design. An experimental group of four- and five-year-old children who had participated a minimum of six weeks in an eight-week Head Start preschool enrichment program were matched child for child to a group of four- and five-year-old children who had never participated, according to their parents, in any type of preschool enrichment program. The subjects were matched upon five variables: race; sex; chronological age, plus or minus three months; level of intelligence; and occupation of parent.

Sample. The population from which members of the experimental group were drawn consisted of 390 children enrolled in Head Start. Members of the control group, obtained by the investigators' using school census lists of four- and five-year-old children, were not participants in Head Start but were qualified by chronological age to enroll in kindergarten in September, 1965. They resided in the school districts where Head Start children enrolled in September, 1965. Letters asking permission for the children to participate in the study were mailed to the parents of approximately 600 children whose names had been obtained from the census lists. (See copy of letter in

Appendix B.) Since positive responses from parents totaled approximately 90 per cent, an ample number of children was available from which to select control-group subjects.

Two hundred sixteen non-Head Start children were matched with 216 Head Start children upon the bases of the five matching variables. After matching the 216 pairs of children, the investigators found that a number of non-white Head Start children remained unmatched. Very few non-white children were available for the control group. For this reason it was decided to match 29 pairs of children upon the basis of sex only and to designate this subsample as a separate non-matched group.

Instruments. The Stanford-Binet Intelligence Scale, Form L-M, was used to assess intellectual level of all subjects, both pre- and posttest. The scale was administered according to prescribed procedure, with the exception that all items or trials of the following subtests were given whether they were passed or failed: (1) Copying a Circle, Year III; (2) Copying a Square, Year V; (3) Copying a Diamond, Year VII; (4) Comprehension, Years IV, IV-6, and VII; (5) Opposite Analogies, Years IV, VI, and VII; (6) Pictorial Similarities and Differences, Years IV-6 and V; (7) Similarities and Differences, Years IV, VII, and VIII: (8) Picture Absurdities, Year VII; and (9) Verbal Absurdities, Year VIII. (See sheet used for recording data in Appendix B.)

An adaptation of the Merrill-Palmer Personality Rating Scale was used to assess social adjustment, both pre- and posttest, and was completed by kindergarten teachers through the use of a five-step

interval scale for each of nine schedules. Areas covered by the schedules were: (1) Ascendance-Submission, (2) Attractiveness of Personality, (3) Compliance with Routine, (4) Independence of Adult Affection or Attention, (5) Physical Attractiveness, (6) Respect for Property Rights, (7) Response to Authority, (8) Sociability with Other Children, and (9) Tendency to Face Reality.

The Preschool Inventory by Bettye M. Caldwell, Ph.D., Syracuse, New York, was used to determine the achievement level of subjects at the beginning of the study as well as their achievement increment near the end of their year in kindergarten. The original form of the Inventory, with 161 items related to the areas of comprehension, numbers, non-verbal concepts, and verbal concepts, was administered as the pretest. Prior to the posttest, a revised, 85-item form of the Inventory was issued. Dr. Bettye M. Caldwell, in direct consultation with the investigators, reported a coefficient of correlation of .97 between the revision and the original form. The revision, therefore was administered as the posttest.

The Warner, Meeker, Ells Occupational Rating Scale was used to determine the occupational level of each subject's father. In cases where the father was dead or did not live in the home, occupational level was determined upon the basis of the mother.

Testing schedule. The Stanford-Binet Intelligence Scale, Form L-M, was administered to all subjects by psychological examiners qualified under the regulations of the State of Nebraska. Subjects in the experimental group were pretested during the last two weeks of their enrollment in the Head Start program, from July 26, 1965

to August 6, 1965. Potential subjects for the control group were pretested prior to their entrance into kindergarten on September 13, 1965.

Sixty of the 390 children initially enrolled in Project Head Start were not given a pretest; investigators' inability to test these children was a result of the refusal of children to cooperate and the transient nature of the children's families. (See Table 20 in Appendix A.) Forty-seven subjects were not matched; reasons ranged from the children's being denied admission to kindergarten because of their low mental ability to their having moved from Lincoln. (See Table 21 in Appendix A.)

Three hundred fifty-eight non-Head Start children were given the pretest of the Stanford-Binet Intelligence Scale. Of these children, 113 were not matched initially because of differences on one or more of the five matching variables.

The majority of the subjects were transported in insured University of Nebraska automobiles from the Head Start centers, their homes, or their elementary schools to the Educational-Psychological Clinic on the University of Nebraska campus for both the pretest and the posttest of the Stanford-Binet. When optimum testing conditions were available, a small number of children were pretested at one Head Start center and a few subjects were pretested and posttested in their elementary schools. The posttest of the Stanford-Binet was administered to each subject approximately eight months after the date of his pretest.

Subjects were rated upon an adaptation of the Merrill-Palmer Personality Rating Scale by their respective kindergarten teachers.

The first ratings were made during the subjects' first four weeks in kindergarten; second ratings, during subjects' last two weeks in kindergarten.

Pretests of the Caldwell Preschool Inventory were administered to all subjects at their respective elementary schools during September, 1965. Testing was done either by psychological examiners qualified under Nebraska requirements or by graduate students at the University of Nebraska in the process of qualifying. The posttests were administered by qualified examiners at the time of the second administration of the Stanford-Binet.

Statistical analyses of the data. Data from the three instruments used in the investigation were collected, coded, and recorded. Statistical computations were made by the Statistical Laboratory on the East Campus of the University of Nebraska.

First, data were analyzed for effectiveness of the matching variables: age, father's occupation, intellectual level, and time between tests. The means were tested by use of *t* values.

Second, results of the major comparisons between the experimental and the control group were made by using *t* values for correlated data. The major comparisons were IQ, MA, vocabulary, psychomotor ability, reasoning, social adjustment, and achievement level.

Third, results of the major comparisons were tested for within-group differences by using paired *t* values.

Fourth, between-group differences and within-group differences were tested by *t* values for minor variables: nine subtests of the Merrill-Palmer, six subtests of psychomotor ability, and the six

subtests of reasoning.

Fifth, t values were computed for all males and for all females upon the major and the minor variables.

Sixth, t values were computed also for the major and the minor variables for both experimental and control groups upon the bases of sex, race, level of intelligence, and parental occupation.

Seventh, correlation analyses were made upon both the pretest and the posttest data for all subjects, for the experimental group, and for the control group.

Eighth, covariance analyses using posttest data as criteria and the pretest data as control variables were made upon the major variables for the matched sample as well as for the nonmatched group.

Personnel. Mary A. Krider, Associate Professor of Educational Psychology and Measurements, University of Nebraska, as principal investigator of the study was responsible for the overall administration, supervision, and completion of the project.

Mary Petsche, Instructor in Human Development and the Family, University of Nebraska, as co-director of the project assisted in the supervision of the project. She assumed the responsibility for training kindergarten teachers to use the adapted Merrill-Palmer Personality Rating Scale.

Stanley M. Reiss and Edwin A. Rautio, doctoral students in the Department of Educational Psychology and Measurements, University of Nebraska, served as research assistants. Both men were licensed psychological examiners who had served as school psychologists in the public schools of Cleveland, Ohio, prior to their enrolling as doctoral

students. Although both men were equally well-qualified, Mr. Reiss was designated as Senior Research Assistant. (Mr. Reiss was awarded the Ph.D. degree in June, 1966; and Mr. Rautio, in February, 1966.)

The primary responsibility of the research assistants was to supervise the administration of the three instruments used in the investigation, to check the scoring of test booklets, to read and check psychological reports, to record data, and to attend to any details assigned by the principal investigator.

Mrs. Annie Laurie Schapmann served as secretary for the project until June 1, 1966. Mrs. Schapmann, who holds a baccalaureate degree from the University of Nebraska, was responsible, in the main, for keeping records, scheduling children and psychological examiners for tests, and helping with the recording of data, typing reports, and performing the many other secretarial duties that arise in a research project.

RESULTS

The results of this investigation have been grouped into five sections according to the type of analysis involved. The content and interrelationships among these sections are described in the paragraphs that follow.

In the first section consideration is given to differences and similarities between the experimental and control groups according to the matching variables employed in the study. It will be recalled that individuals in the experimental group were matched person-for-person with individuals in the control group according to sex, race, general level of intelligence, and occupational level of parents. Matching on the basis of chronological age, however, was made within three months. The difference between groups on chronological age was, therefore, analyzed for significance, along with the difference in time between pre- and posttest administrations reported to the nearest month.

In the second section the results of testing the three major null hypotheses and the three subordinate null hypotheses in the study are shown. Specifically, results from comparing the differences <u>between</u> the experimental group and the control group according to changes in (1) intellectual, (2) social, and (3) achievement factors are presented.

The third section contains the results of evaluating the significance of the changes <u>within</u> the experimental group and <u>within</u> the control group. This evaluation consisted of comparing the

distribution of scores from the first and second administrations of the measuring devices used in the study.

In the fourth section the coefficients of correlation between all pairs of variables involved in the major hypotheses are presented. These coefficients include intervariable correlations, those involving two different tests; as well as intravariable correlations, those involving the re-administration of the same test to the experimental and control subjects.

The last section contains the results of analyzing the data from 41 subjects who could not be paired according to the matching variables other than by sex. This subsample was designated the non-matched group and all data from it were analyzed by analysis of covariance. Comparisons are shown for experimental and control group changes in intellectual, social and achievement functions, with various combinations of intelligence and pretest scores controlled.

It will be recalled that the investigation was undertaken with a matched sample of 216 pairs of children and with a nonmatched group of 58 children. The study was concluded with 197 pairs in the matched sample and 41 children in the nonmatched group. Attrition was a result of subjects having moved from the Lincoln area. Whenever possible, the investigators re-paired broken matches by using children who had been pretested but not matched. Attempts were also made to ascertain the areas to which children had moved and to have them posttested if qualified examiners could be identified in the area. In some cases re-pairing of matches resulted in insufficient data; inasmuch as the re-matched subject in some instances had not been rated

initially upon the Merrill-Palmer. Some comparisons were, therefore, made with an N slightly smaller than 197 pairs.

Results from detailed stratification of the data are presented in Appendix A. In general, the implications of these results will be of greater significance to psychometry and child development than to Project Head Start administrators. Wherever results from the detailed analyses have implications for the present study, they are referred to in the context of the report.

Effectiveness of Matching

To determine the extent to which the matching procedure resulted in comparable groups, the means, standard errors and significance of the difference were computed for each matching variable and are shown in Table 1. From this table it can be seen that the means for Level of Intelligence and for Parental Occupations were identical. The identity was forced mathematically and resulted from the pairing process.

The means for Time between Tests were similar but not significantly different since they were 8.06 months for the experimental group and 8.01, for the control group. The means for Age of Children differed by 1.59 months (65.05 and 63.46 months) and the difference was significant at the .001 level.

Since the two groups were found to be significantly different with respect to chronological age, an additional analysis was made by sex. It was found that the female subjects did not differ significantly on chronological age, but that the male subjects did differ

significantly. The t value for females was 1.79 and for males 3.60. In each instance the experimental group was younger than the control group. It had been assumed by the investigators that the differences between the groups on chronological age would cancel, but this assumption was not borne out. It was, therefore, concluded that although the two groups were comparable with respect to sex, race, general level

TABLE 1

EFFECTIVENESS OF MATCHING EXPERIMENTAL AND CONTROL GROUPS (N=197 pairs)

Matching Variable	Experimental		Control		Significance
	Mean	Std. Error	Mean	Std. Error	t
Level of Intelligence (1-6)	4.02	.06	4.02	.06	0.00
Parental Occupation (1-8)	5.38	.09	5.38	.09	0.00
Age of Children (months)	63.46	.28	65.05	.25	-4.26***
Time between Tests (months)	8.06	.04	8.01	.01	.97

***Significant at $p < .001$ level of significance

of intelligence, level of father's occupation and time between tests, they were not comparable with respect to chronological age. For this reason, two types of analysis of the data were made--one without individual differences in chronological age controlled, and the other with chronological age controlled. In the two types of comparisons,

the analysis of variance for correlated data was used to test significance between means when chronological age was not controlled and the analysis of covariance was used to test significance between means when individual differences in chronological ages were controlled. Results of both types of analysis are shown throughout the report.

Between-Group Comparisons

Hypothesis 1. There is no significant increment in the measured general intellectual ability of Head Start children when compared to the measured general intellectual ability of their selected non-Head Start counterparts.

The null hypothesis assumed no significant difference between the experimental and the control group in increments of measured general intellectual ability. Results--intelligence quotients (IQs) and mental ages (MAs)--obtained from a second administration of the Stanford-Binet Intelligence Scale, Form L-M, were the measures used for determining increments in general intellectual ability. It will be recalled that subjects were matched for level of general intellectual ability upon the basis of results obtained from the first administration of the Stanford-Binet Intelligence Scale, Form L-M. Data derived from this instrument, both pretest and posttest, are shown in Table 2.

The increments in mean intelligence quotients were similar for both groups, but the experimental group had a slightly greater increase in measured IQ than did the control group. The mean IQ of the experimental group, 197 Head Start children, was 100.34 upon the first administration of the Stanford-Binet; but when the scale was administered

TABLE 2

BETWEEN-GROUP CHANGES IN MEAN INTELLIGENCE QUOTIENTS, MENTAL AGES, VOCABULARY SCORES, REASONING SCORES, AND PSYCHOMOTOR SCORES
(N=197 pairs)

Variable	Experimental Means			Control Means			Significance
	Pre	Post	Diff.	Pre	Post	Diff.	t
Stanford-Binet:							
IQ	100.34	104.64	4.30	101.10	105.31	4.21	.09
MA	63.73	74.69	10.96	65.52	76.40	10.88	.12
Vocabulary	4.76	6.18	1.42	5.12	6.52	1.39	.13
Reasoning	23.87	32.87	9.00	25.40	33.93	8.53	.97
Psychomotor	4.49	6.00	1.51	4.91	6.28	1.37	.81

approximately eight months later, the mean IQ of the group was 104.64. The result was an increase of 4.3 IQ points. In contrast, the mean IQ of the control group, 197 non-Head Start children, was 101.10 as determined by the first administration of the Stanford-Binet. Eight months later, the retest of the control group resulted in a mean IQ of 105.31, or an increase of 4.21 IQ points. Although subjects were matched upon the criterion of intellectual level rather than upon specific intelligence quotients, the difference between the mean IQ of the experimental group and of the control group was only .26 of a point as determined from the pretest, or first administration of the Stanford-Binet. A t value of .09 indicated that no measurable significant increment was found between the experimental and the control group upon mean IQ.

Since IQ is a function of MA as determined by the Stanford-Binet, it was assumed in the null hypothesis that no significant increment in MA existed between the experimental and the control group. The mean MA of the experimental group was 63.73 months at the beginning of the study as determined from the first administration of the L-M scale. At the end of approximately eight months the mean MA for the experimental group was 74.69 months--an increment of 10.96, or approximately 11 months. Results obtained from the first administration of the Stanford-Binet showed that the control group had a mean MA of 65.52 months. When the scale was re-administered eight months later, the mean MA of the group had increased to 76.40 months, or an increment of 10.88 months. Although there was a slight increment in mean MA in the direction of the experimental group, the difference between

the mean increments was not significant. The value of *t* was .12. Pertinent data are presented in Table 2.

Non-Head Start subjects were 1.79 months older in MA than were the Head Start subjects. This finding correlated with the difference of 1.59 months which was found to exist in chronological age. It will be recalled that when the data had been analyzed as presented in Table 1, the difference in chronological age between the experimental and the control group was found to be significant at the .001 level. Since this finding had been obtained, chronological age and pretest scores were controlled by using analysis of covariance. Data resulting from this procedure are presented in Table 3. A comparison of the mean increments in IQ for the two groups resulted in an *F* value of .17. The same type of comparison for increments in mean MA resulted in an *F* of .08. Thus, both the *t* and *F* values derived from comparing the increments in mean IQ and in mean MA for the experimental and control group were not significant. The first major null hypothesis was not rejected.

Subhypothesis 1-a. There is no measurable significant increment in the Vocabulary subtest scores of Head Start children when compared to the Vocabulary subtest scores of their selected non-Head Start counterparts.

Data used to test this subhypothesis were the raw scores earned by subjects upon the Vocabulary subtest of the Stanford-Binet. According to the directions for scoring the Vocabulary subtest, a subject receives one point of credit for each word that he defines correctly. A child must define six words correctly in order to receive credit

TABLE 3

SUMMARY OF ANALYSIS OF COVARIANCE FOR THE EXPERIMENTAL AND CONTROL GROUPS ON THE MAJOR CRITERION VARIABLES WITH PRETEST SCORES AND CHRONOLOGICAL AGE CONTROLLED[a]

Source	Adjusted Sum of Squares	Mean Square	F
Stanford-Binet:			
IQ			
Error	17289.57	90.52	.17
Treatment	15.77	15.77	
MA			
Error	6942.90	36.35	.08
Treatment	3.03	3.03	
Vocabulary			
Error	464.06	2.42	.77
Treatment	1.87	1.87	
Psychomotor			
Error	363.43	1.90	.01
Treatment	.02	.02	
Reasoning			
Error	3511.35	18.38	.05
Treatment	1.05	1.05	
Adapted Merrill-Palmer			
Error	4169.07	21.82	3.37
Treatment	73.65	73.65	
Caldwell Preschool Inventory			
Error	7209.07	37.74	2.08
Treatment	78.56	78.56	

[a] *df* = 1/191 in each instance

for vocabulary at the sixth-year level of intelligence. From the data which are presented in Table 2, it can be ascertained that the mean number of words defined by the experimental and by the control group was below the sixth-year level upon the pretest; the respective means were 4.76 and 5.12. Upon the posttest, the mean number of words defined by the experimental group and by the control group was 6.18 and 6.52, respectively. When comparisons were made between the mean increments of the two groups, a significant difference did not obtain. The *t* value was .13. When controlling chronological age and pretest scores, the investigators found an *F* of .77, which also was not significant. Since both the *t* and *F* values were not significant, subhypothesis 1-a was not rejected.

Subhypothesis 1-b. There is no measurable significant increment in the total scores of Head Start children upon subtests of psychomotor ability when compared to the total scores of their selected non-Head Start counterparts upon subtests of psychomotor ability.

Data for testing this subhypothesis were obtained by summing the raw scores of Head Start subjects and of non-Head Start subjects upon three subtests selected from the Stanford-Binet for the purpose of assessing psychomotor ability. The subtests were: Copying a Circle, Year III; Copying a Square, Year V; and Copying a Diamond, Year VII. Standard administration procedure for each of the subtests permits three trials; one point is given for the correct completion of each trial. Only one point is required in order for a subject to receive credit for the subtest at the age level at which it appears upon Form L-M, but the investigators arbitrarily decided to have all

trials administered. It was, therefore, possible for a subject to earn a score of three points upon each subtest. Hence, the maximum score possible for the successful completion of the three subtests was nine points. The mean score of the experimental group was 4.49 upon the pretest as compared with 4.91 for the control group. The mean scores of the posttests were 6.00 and 6.28, respectively. When the difference between the two groups was compared, the resulting *t* of .81 was not significant. These data are presented in Table 2. Null subhypothesis 1-b was not rejected.

Chronological age and pretest scores were controlled in the treatment of the data by analysis of covariance. An *F* of .01 was not significant. Pertinent data appear in Table 3.

Additional comparisons were made for each of the three subtests used to assess psychomotor ability between Head Start subjects and non-Head Start subjects upon the basis of their group means. Data for these comparisons are presented in Table 4. When the mean scores were compared for Copying a Circle, a *t* value of 1.00 was obtained. The values of *t* for Copying a Square and for Copying a Diamond were 1.49 and -1.00, respectively. None of the subtest comparisons was significant.

Subhypothesis 1-c. There is no significant measurable increment in the total scores of Head Start children upon subtests of reasoning when compared to the total scores of their selected non-Head Start counterparts upon subtests of reasoning.

Raw scores from six types of subtests from the Stanford-Binet were summed to furnish data for testing this subhypothesis. The

TABLE 4

BETWEEN-GROUP CHANGES IN MEAN SCORES ON SELECTED SUBTESTS OF THE STANFORD-BINET INTELLIGENCE SCALE, FORM L-M
(N=194 pairs)

Subtest	Experimental Means			Control Means			Significance
	Pre	Post	Diff.	Pre	Post	Diff.	t
Psychomotor:							
Copying a Circle	3.00	3.01	.01	3.00	3.00	0.00	1.00
Copying a Square	1.37	2.52	1.14	1.70	2.64	.94	1.49
Copying a Diamond	.11	.47	.36	.20	.67	.46	-1.00
Reasoning:							
Comprehension	3.60	5.44	1.84	4.11	5.36	1.25	4.11***
Opposite Analogies	6.10	8.92	2.81	6.74	9.24	2.50	1.47
Pictorial Similarities and Differences	11.29	11.96	.67	11.32	11.95	.62	.27
Similarities and Differences	1.41	3.48	2.07	1.53	3.88	2.34	-1.14
Picture Absurdities	1.32	2.58	1.25	1.62	2.83	1.21	.27
Verbal Absurdities	.07	.46	.39	.14	.63	.48	-1.18

***Significant at $p < .001$ level of significance

subtests were as follows:

Comprehension, Years IV, IV-6 and VII

Opposite Analogies, Years IV, VI, and VII

Pictorial Similarities and Differences, Years IV-6 and V

Similarities and Differences, Years VI, VII, and VIII

Picture Absurdities, Year VII

Verbal Absurdities, Year VIII

All items of each subtest were administered. Standard testing procedure upon the Stanford-Binet, for example, requires that a subject receivescredit for Comprehension at Year VIII provided that he answers four of the six items correctly. Thus, it would be possible for a subject to receive credit for the subtests without having to answer items 5 and 6. The maximum score possible because of the overtesting procedure was fifty-nine points. Although subjects were overtested on the subtests selected to measure reasoning, standard procedure for scoring was followed in calculating MAs and IQs.

The mean total reasoning score for the experimental group as determined by the pretest was 23.87 in contrast to a mean score of 25.40 for the control group. The means upon the posttest were 32.87 and 33.93, respectively. When comparisons were made between the experimental and the control group, a t value of .97 was found. This value was not significant at the 5 per cent level of confidence. The relevant data appear in Table 4.

No significant difference was found between groups when chronological age and pretest scores were controlled by analysis of covariance.

An F of .05 was calculated. The non-significant values of t and F resulted in a failure to reject subhypothesis 1-c.

Data from each of the six types of subtests used to measure reasoning ability were analyzed for significant differences between the experimental and the control group. The data are presented in Table 4.

The sum of the raw scores possible from the Comprehension subtests was ten points per subject. The mean pretest score for the experimental group was 3.60 compared to a mean score of 4.11 for the control group. Mean scores upon the posttests were 5.44 and 5.36, respectively. The data are presented in Table 4. When the mean scores of Head Start subjects were compared with the mean scores of non-Head Start subjects, a t value of 4.11 was obtained. Since the value of t was significant at the .001 level of confidence, one may conclude that the two groups were different in respect to increments in ability to comprehend as measured by subtests selected from the Stanford-Binet. A significantly greater increment in Comprehension subtest scores was made by Head Start subjects.

A comparison was also made between the mean scores earned by the two groups of subjects upon Opposite Analogies subtests. It was possible for a subject to earn a maximum raw score of thirteen points. The mean pretest score of the experimental group was 6.10 as compared to 6.74, the mean pretest score for the control group. The means derived from the posttests were 8.92 and 9.24, respectively. From the data presented in Table 4, it may be ascertained that no significant

difference was found between the two groups. The obtained t of 1.47 was not significant.

A maximum raw score of 16 points was possible for any given subject upon the Pictorial Similarities and Differences subtests. The mean pretest score was 11.28 for the experimental group and 11.32 for the control group; whereas the posttest mean for the experimental group was 11.96 as compared to 11.95 for the control group. From the data presented in Table 4, it can be seen that no significant difference existed between groups. The t value was .27.

It was possible for a given subject to earn a maximum raw score of eleven points from the subtests involving Similarities and Differences. The subtests fall at the sixth-, seventh-, and eighth-year levels upon the Stanford-Binet. The mean pretest score was 1.41 for the experimental group as compared with 1.53 for the control group. The posttest means were 3.48 for the experimental group and 3.88 for the control group. When the pertinent test data were compared, a non-significant t value of -1.14 was found. The data are presented in Table 4.

The maximum raw score possible upon Picture Absurdities, Year VII of the Stanford-Binet was six points. The mean score for the experimental group upon the pretest was 1.32, but for the control group the mean was 1.62. The mean score derived from the posttest by the experimental group was 2.58 as compared to 2.83 for the control group. The t value for the difference between the two groups was .27; it was not significant as shown by the data in Table 4.

The maximum raw score upon Verbal Absurdities at Year VIII of the Stanford-Binet was four points provided that the subject answered all items correctly upon the overtest procedure. The mean pretest score for the experimental group was.07 as compared to .14 for the control group. The mean score upon the posttest was .46 for the experimental group and .63 for the control group. When the group differences were compared, a t value of -1.18 resulted and proved not to be significant. Relevant data may be found in Table 4.

Hypothesis 2. There is no significant increment in the measured social adjustment of Head Start children when compared to the measured social adjustment of their selected non-Head Start counterparts.

The null hypothesis assumed that no difference in social adjustment existed between the subjects of the experimental group and those of the control group at the end of the kindergarten year.

An adaptation of the Merrill-Palmer Personality Rating Scale (Appendix C) was used to measure the social adjustment of experimental and control subjects. The Merrill-Palmer Personality Rating Scale as revised by staff members of the Department of Human Development and the Family, University of Nebraska, includes all the descriptive elements of the original form. The adaptation, however, provides for the observer to rate the subject on a five-point scale from "most" (1) to "least" (5) for each schedule. It should be noted that this method of scoring produced negative scores when increments in social adjustment resulted.

In the present investigation, one teacher rated each subject on the adaptation of the Merrill-Palmer. Teachers were asked to rate

subjects approximately four weeks after meeting them for the first time in the kindergarten classrooms and again two weeks prior to the end of the school term. Teachers received instruction in the use of the scale previous to their using it.

Teachers were aware of which children had been enrolled in Head Start. To eliminate teacher bias from the study completely, it would have been desirable if teachers could have rated experimental and control subjects without knowing which children had participated in Head Start. This procedure was not practical; however, as Head Start children were identified even before kindergarten began, pursuant to an agreement between administrators of the Lincoln Public School System and directors of Head Start. In addition, Head Start children typically identified themselves proudly to teachers on their first day at kindergarten.

Means of the total adjustment score derived from teachers' ratings upon the adapted Merrill-Palmer indicated that subjects in the control group were better adjusted socially to the kindergarten situation at the beginning of the school term than were subjects from the experimental group. Experimental subjects were rated as better adjusted socially, however, at the end of kindergarten. It will be recalled that the ratings were accomplished upon a five-point scale and that the best scores were the lowest scores numerically. Pertinent data are shown in Table 5. From these data it can be observed that a t value of -2.48 was obtained. A significant difference, therefore, existed at the .05 level between the mean increment in social adjustment of the experimental group as compared to that of the control group.

TABLE 5

BETWEEN-GROUP CHANGES IN MEAN RATING SCORES ON SCHEDULES OF AN ADAPTATION OF THE MERRILL-PALMER PERSONALITY RATING SCALE
(N=194 pairs)

Schedule	Experimental Means			Control Means			Significance
	Pre	Post	Diff.	Pre	Post	Diff.	t
Ascendance-Submission	3.01	3.03	.02	3.15	2.98	-.17	2.21*
Attractiveness of Personality	3.02	2.77	-.25	2.84	2.80	-.04	-2.26*
Compliance with Routine	2.86	2.52	-.34	2.59	2.54	-.05	-3.31**
Independence of Adult Affection or Attention	2.93	2.66	-.27	2.79	2.71	-.08	-2.07*
Physical Attractiveness	2.62	2.40	-.22	2.47	2.46	-.01	-2.73**
Respect for Property Rights	2.63	2.30	-.33	2.44	2.29	-.15	-1.76
Response to Authority	2.94	2.59	-.35	2.71	2.65	-.06	-2.74**
Sociability with Other Children	2.96	2.78	-.18	2.93	2.77	-.16	- .21
Tendency to Face Reality	2.98	2.74	-.24	2.89	2.82	-.07	-1.65
TOTAL	26.01	23.90	-2.11	24.80	24.05	-.75	-2.48*

*Significant at $p < .05$ level of significance
**Significant at $p < .01$ level of significance

When the experimental and the control groups were compared with pre-test scores and chronological age controlled, analysis of covariance, however, yielded an F of 3.37 which was not significant.

The data derived from teachers' rating upon each schedule of the adapted Merrill-Palmer were also treated statistically in order to determine whether or not any significant differences obtained. Mean increments of the experimental group proved to be significantly greater than the mean increments of the control group on five of the nine schedules. The schedules were: Attractiveness of Personality, Compliance with Routine, Independence of Adult Affection or Attention, Physical Attractiveness, and Response to Authority. In contrast, however, no significant differences were found in teachers' ratings on three of the nine schedules, which were: Respect for Property Rights, Sociability with Other Children, and Tendency to Face Reality. The mean increase in each of the three schedules, however, was in the direction of experimental subjects.

Head Start subjects decreased slightly in ascendant behavior during the kindergarten year according to teachers' ratings. In contrast, the control group of non-Head Start children who had been rated as being less ascendant (3.14 on a five-point scale) at the beginning of the kindergarten year were rated as more ascendant (2.96 on a five-point scale) at the end of the kindergarten year. A t value of 2.21 was significant at the .05 level. Pertinent data are shown in Table 5.

Mean increments of the experimental group were significantly greater than were mean increments of the control group in teachers'

ratings of Attractiveness of Personality. The ratings indicated that, in general, Head Start children had personality characteristics less attractive to their teachers at the beginning of the year than did non-Head Start children. (See descriptive characteristics in Appendix C.) Experimental subjects, however, had more attractive personality characteristics at the end of the year than did members of the control group whose ratings had changed only slightly from the pretest ratings to those of the posttest. From the data presented in Table 5, it can be seen that a t value of -2.76 was found to be significant at the .05 level.

The mean increase of the experimental group in Compliance with Routine was significantly greater than was the mean increase of the control group. The t value of -3.31, as shown in Table 5, was significant at the .01 level. Experimental subjects were less compliant with the routine of the classroom than were control subjects at the outset of the kindergarten year according to teachers' ratings, but the members of the experimental group were more compliant at the close of the kindergarten year than were the members of the control group.

The mean increase on Independence of Adult Affection or Attention was significantly greater for experimental subjects than for control subjects. The derived t value of -2.07 was significant at the .05 level. Teachers rated the Head Start subjects as being less independent of adult affection or attention than control subjects at the beginning of the school year, but at the end of the kindergarten year teachers rated experimental subjects as more independent of adult affection or attention. The data are shown in Table 5.

Experimental subjects increased significantly in teachers' ratings of Physcial Attractiveness when compared with control subjects. Experimental subjects were rated on the pretest as less attractive physically than control subjects, but as more attractive than control subjects at the end of the kindergarten year. As shown in Table 5, a t value of -2.73 proved to be significant at the .01 level.

There was no significant difference between the experimental and the control group in the mean increase of Respect for Property Rights. Both groups increased according to teachers' ratings on this schedule. The group means indicated a slightly larger increase among Head Start children than among their non-Head Start counterparts, but the increment was not significant at the .05 level. Teachers' ratings, nevertheless, indicated that control subjects had greater respect for others' property at the beginning of the kindergarten year than did experimental subjects. Relevant data are available in Table 5.

The experimental group attained a mean increment in teachers' ratings on Response to Authority that was significantly greater than the mean increment of the control group. Control subjects showed a greater response at the beginning of the kindergarten year to the authority represented by the teacher, but at the end of the school year experimental subjects evidenced a greater response. As shown by the data in Table 5, a t value of -2.74 was significant at the .01 level.

There was no significant difference between the mean increments of the experimental group and of the control group on the

adapted Merrill-Palmer schedule of Sociability with Other Children. Teachers rated control subjects as being slightly more sociable than experimental subjects. Both groups increased in sociability according to the results which are presented in Table 5, but the t value of -.21 was not significant.

There was a significant mean increase between experimental and control subjects on teachers' ratings of Tendency to Face Reality. Data presented in Table 5 suggested a greater mean increase for the experimental group on ratings of Tendency to Face Reality than for the control group. The mean difference between the groups as represented by a t value of -1.65 was not significant.

Hypothesis 3. There is no significant increment in the measured level of achievement of Head Start children when compared to the measured level of achievement of their selected non-Head Start counterparts.

The null hypothesis assumed that no difference existed between the experimental group and the control group in level of achievement at the end of the kindergarten year. The Preschool Inventory by Bettye M. Caldwell, Ph.D., Syracuse, New York, was used as the instrument to collect data for testing this hypothesis. The Inventory is not an intelligence test, but a test of the skills that a child is expected to develop from the kindergarten experience. Since the Inventory had been designated for use in Head Start centers throughout the United States during the summer of 1965, the investigators decided to continue its use. Data collected from two administrations of the instrument are shown in Table 6.

TABLE 6

BETWEEN-GROUP CHANGES IN MEAN SCORES ON THE
CALDWELL PRESCHOOL INVENTORY

Subject	Experimental Means			Control Means			Significance
	Pre	Post	Diff.	Pre	Post	Diff.	t
All Subjects[a]	73.03	80.96	7.93	74.46	82.68	8.22	- .34
Males[b]	71.78	80.73	8.95	74.92	83.41	8.49	- .37
Females[c]	74.53	81.23	6.70	73.92	81.80	7.88	-1.12

[a]193 df

[b]105 df

[c]87 df

When the means of the global results obtained by the experimental group were compared with those obtained by the control group, no significant increment was found. The mean scores for the experimental and for the control group upon the pretest were 73.03 and 74.46, respectively, whereas the respective posttest mean scores were 80.96 and 82.68. The t value was -.34. The null hypothesis was not rejected.

Comparisons made between males of the two groups yielded results that were not significant, as determined by a t value of -.37. The t value of -1.12 found for differences between females of the experimental and of the control group also was not significant.

Minor Between-Group Comparisons

Data were stratified by subjects' levels of intelligence and t values were computed for mean differences at each level for each group upon the five dependent variables related to intellectual functioning. The frequency of subjects by levels of intelligence approximated a normal distribution. (See Table 23 in Appendix A.) When the data were stratified, a small N resulted at some levels. A t value of -3.05 significant at the .01 level with 26 degrees of freedom was found between the mean IQs for subjects in Level 3; this is the level in which IQs range from 80 to 89 upon the Stanford-Binet. A t value of -3.24 for MA at Level 3 was also significant at the .01 level. A t value of 3.18 was found between the mean MAs of subjects in Level 2 and was significant at the .05 level with nine degrees of freedom. Stanford-Binet IQs range from 70 to 79 in Level 2. Complete data of the stratification by level of intelligence are presented in Table 25 in Appendix A.

Comparisons were made between the sexes of the two groups upon the five dependent variables related to intellectual functioning. A t value of 2.51 was found for the mean difference in reasoning ability of females. The t was significant at the .05 level; the trend was toward girls in the experimental group. Complete data are presented in Table 26, Appendix A.

Comparisons were also made between groups by sex and race--white and nonwhite--upon the bases of the five dependent variables related to intellectual ability. Again, a significant difference was found between the mean reasoning scores of females. A t of 5.51 was significant for white girls at the 5 per cent level; the trend was toward the experimental group. A significant difference in mean IQ and mean MA was found in the direction of nonwhite males of the control group. The t values were 2.13 and 2.11 for IQ and MA, respectively; both values were significant at the .05 level. Data are presented in Table 27 in Appendix A.

Subjects were stratified by levels of parental occupation in order that comparisons might be made between mean differences at each level for each group upon the five dependent variables related to intellectual functioning. No significant differences were found. Complete data for the comparisons may be reviewed in Table 28 in Appendix A.

It should be pointed out that the frequency of subjects in each level of parents' occupation approximated a normal distribution. These data may be seen in Table 24 in Appendix A.

Within-Group Differences

No hypotheses were made concerning changes in mean pre- and posttest scores within the experimental group and within the control group at the inception of the present investigation. When two of the three major null hypotheses and the three null subhypotheses tested in the study could not be rejected, the investigators were forced to conclude that their sample had been drawn from the same population on the dependent variables of IQ, MA, vocabulary, psychomotor ability, reasoning, and level of achievement. It was, thereupon, decided to examine the data for significant differences within groups.

Measured intellectual ability. Data obtained from the first and second administrations of the Stanford-Binet Intelligence Scale, Form L-M, are presented in Table 7. Both the experimental and the control group made significant gains in all areas of intellectual functioning as defined in this investigation. Five measurements from the Stanford-Binet: IQ, MA, vocabulary, psychomotor subtest scores, and reasoning subtest scores were used. When within-group comparisons were made for each of the measures for the experimental group, each comparison was found to be significant at the .001 level. The same level of significance obtained for each of the variables within the control group. It was found, therefore, that despite the evidence that no significant difference existed between groups in IQ, MA, vocabulary, psychomotor ability, and reasoning, both groups had made significant intellectual gains during the eight-month period between the pre- and posttest of the Stanford-Binet Intelligence Scale, Form L-M.

TABLE 7

WITHIN-GROUP CHANGES IN MEAN INTELLIGENCE QUOTIENTS, MENTAL AGES VOCABULARY TEST SCORES, REASONING SCORES, AND PSYCHOMOTOR SCORES

Variable	Experimental Means				Control Means			
	Pre	Post	Diff.	t	Pre	Post	Diff.	t
Stanford-Binet:								
IQ	99.81	104.12	4.31	6.00***	101.07	105.38	4.31	5.68***
MA	63.43	74.31	10.88	25.06***	65.51	76.44	10.93	24.07***
Vocabulary	4.75	6.48	1.73	5.09***	5.13	6.52	1.39	9.53***
Psychomotor	4.45	6.14	1.69	8.76***	4.92	6.27	1.35	10.17***
Reasoning	23.76	32.82	9.06	25.96***	25.38	33.90	8.52	23.03***

***Significant at $p < .001$ level of significance

Comparisons within groups were also made for the data obtained from each of the types of subtests selected from the Stanford-Binet for the measurement of psychomotor ability and reasoning. Pertinent data are presented in Table 8. When the pre- and posttest raw scores obtained by each group for Copying a Circle were compared, the mean difference was found not to be significant within either group at the .05 level. In contrast, significant within-group differences were found for both the experimental and the control group upon Copying a Square and Copying a Diamond. In each instance the t value was significant at the .001 level.

A total reasoning score was compiled from the raw scores earned upon subtests involving comprehension, opposite analogies, pictorial similarities and differences, similarities and differences, picture and verbal absurdities. Data derived from each of the above-mentioned categories were compared for mean differences within groups. As can be seen from Table 8, significant differences at the .001 level were found within the experimental group as well as within the control group for all categories except Similarities and Differences for which the mean difference was significant at the .01 level for the experimental group only.

Social adjustment. The only significant major difference between the experimental and the control group in the present investigation was found in social adjustment as measured by an adaptation of the Merrill-Palmer Personality Rating Scale. Data derived from studying the total, or global, within-group differences upon the

TABLE 8

WITHIN-GROUP CHANGES IN MEAN SCORES OF SELECTED SUBTESTS OF THE STANFORD-BINET INTELLIGENCE SCALE, FORM L-M
(N= 194 pairs)

Subtest	Experimental Means				Control Means			
	Pre	Post	Diff.	t	Pre	Post	Diff.	t
Psychomotor:								
Copying a Circle	2.98	3.00	.02	1.00	3.00	3.00	0.00	0.00
Copying a Square	1.35	2.52	1.17	12.44***	1.72	2.63	.91	8.78***
Copying a Diamond	.11	.47	.36	4.88***	.20	.68	.48	6.04***
Reasoning:								
Comprehension	3.58	5.42	1.84	17.54***	4.11	5.35	1.24	11.59***
Opposite Analogies	1.85	6.15	4.30	18.68***	1.24	6.71	5.47	21.06***
Pictorial Similarities and Differences	2.89	11.34	8.45	36.85***	2.87	11.32	8.45	37.36***
Similarities and Differences	.78	1.39	.61	2.74**	.63	1.55	.92	4.85***
Picture Absurdities	.00	2.35	2.35	17.25***	.00	2.51	2.51	17.85***
Verbal Absurdities	.11	.48	.37	6.08***	.14	.62	.48	7.41***

**Significant at $p < .01$ level of significance
***Significant at $p < .001$ level of significance

scale as well as upon the nine schedules, or subtests, of the scale are presented in Table 9.

The difference between the global means within the experimental group was significant at the .001 level. In contrast, the difference within the control group was significant at the .05 level.

Experimental subjects showed significant growth upon all schedules of the scale except one--Ascendance-Submission. The control group however, showed a gain which was significant at the .01 level upon Ascendance-Submission.

The experimental group showed a significant difference at the .001 level between the pretest and the posttest upon seven schedules of the adaptation of the Merrill-Palmer. The schedules were: Attractiveness of Personality, Compliance with Routine, Independence of Adult Affection or Attention, Physical Attractiveness, Respect for Property Rights, Response to Authority, and Tendency to Face Reality. In contrast, a significant difference within the control group appeared upon only one of the abovementioned schedules--Respect for Property; the t value was significant at the .05 level.

Both the experimental and the control group evidenced a significant mean difference between the pretest and the posttest upon the schedule, Sociability with Other Children. The difference for each group was significant at the 5 per cent level.

Achievement level. Within-group comparisons were made upon the Caldwell Preschool Inventory. Both the experimental and the control group made a significant increment between the first and the

TABLE 9

WITHIN-GROUP CHANGES IN MEAN SCORES OF SCHEDULES OF AN ADAPTATION OF THE MERRILL-PALMER PERSONALITY RATING SCALE
(N=194 pairs)

Schedule	Pre	Post	Diff.	t	Pre	Post	Diff.	t
Ascendance-Submission	3.00	3.03	.03	.45	3.14	2.96	-.18	-3.02**
Attractiveness of Personality	3.03	2.78	-.25	-3.41***	2.82	2.79	-.03	- .53
Compliance with Routine	2.86	2.53	-.33	-4.43***	2.59	2.53	-.06	-1.15
Independence of Adult Affection or Attention	2.92	2.67	-.25	-3.76***	2.78	2.70	-.08	-1.25
Physical Attractiveness	2.62	2.39	-.23	-3.94***	2.46	2.47	.01	.11
Respect for Property Rights	2.64	2.29	-.35	-4.92***	2.43	2.29	-.14	-2.33*
Response to Authority	2.95	2.59	-.36	-4.67***	2.70	2.64	-.06	- .76
Sociability with Other Children	2.96	2.78	-.18	-2.55*	2.91	2.76	-.15	-2.37*
Tendency to Face Reality	2.98	2.75	-.23	-3.35***	2.88	2.80	-.08	-1.16
TOTAL	26.01	23.90	-2.11	-5.18***	24.72	23.97	-.75	-2.23*

*Significant at $p < .05$ level of significance
**Significant at $p < .01$ level of significance
***Significant at $p < .001$ level of significance

second administration of the Inventory. The respective mean differences were significant at the .001 level. Comparisons between female subjects were significant for both groups at the .001 level as were the differences between the males of each group. Pertinent data may be seen in Table 10.

Correlation Between Distributions

To determine the relationships between combinations of variables in this study, correlation matrices for each group and for the total sample were computed for the seven variables involved in the major hypotheses. Coefficients of correlation between the first and second administrations for the seven variables were also computed for each group and for the total sample.

Tables 11 and 12 show the intercorrelations for the seven variables in the study. These coefficients are based on the experimental group only, N = 196. Tables 13 and 14 show the coefficients of correlation between the variables for the control group, N = 196. Tables 15 and 16 show similar correlations based on the total group, N = 392.

Examination of Tables 11 through 16 seems to show high correlations between tests measuring similar functions. The correlation between MA and IQ was spuriously high in each case due to the interrelationship of the two factors in scoring.

Correlations were also high between the Caldwell Preschool Inventory and factors of IQ and MA. Correlations were higher for the posttest than for the pretest administrations for both experimental

TABLE 10

WITHIN-GROUP CHANGES IN MEAN SCORES ON THE
CALDWELL PRESCHOOL INVENTORY

Subject	Experimental Means				Control Means			
	Pre	Post	Diff.	t	Pre	Post	Diff.	t
All Subjects[a]	72.68	80.47	7.79	14.26***	74.44	82.73	8.29	15.24***
Males[b]	71.82	80.64	8.82	10.65***	74.88	83.50	8.62	10.86***
Females[c]	73.71	80.28	6.57	9.96***	73.92	81.80	7.88	10.85***

a = 193 df
b = 105 df
c = 87 df

***Significant at p < .001 level of significance

TABLE 11

COEFFICIENTS OF CORRELATION BETWEEN VARIABLES BASED ON THE EXPERIMENTAL GROUP PRETEST DATA

	IQ	MA	M-P	Preschool	Vocabulary	Psychomotor
Mental Age	.89					
Adapted Merrill-Palmer	-.41	-.42				
Caldwell Preschool Inventory	.61	.68	-.36			
Vocabulary	.44	.76	-.41	.58		
Psychomotor	.49	.53	-.36	.40	.38	
Reasoning	.80	.91	-.41	.68	.73	.41

TABLE 12

COEFFICIENTS OF CORRELATION BETWEEN VARIABLES BASED ON THE EXPERIMENTAL GROUP POSTTEST DATA

	IQ	MA	M-P	Preschool	Vocabulary	Psychomotor
Mental Age	.91					
Adapted Merrill-Palmer	-.38	-.39				
Caldwell Preschool Inventory	.76	.82	-.38			
Vocabulary	.57	.65	-.27	.50		
Psychomotor	.39	.41	-.31	.35	.26	
Reasoning	.78	.85	-.44	.74	.56	.33

TABLE 13

COEFFICIENTS OF CORRELATION BETWEEN VARIABLES BASED ON THE CONTROL GROUP PRETEST DATA

	IQ	MA	M-P	Preschool	Vocabulary	Psychomotor
Mental Age	.90					
Adapted Merrill-Palmer	-.30	-.42				
Caldwell Preschool Inventory	.64	.68	-.40			
Vocabulary	.65	.72	-.37	.51		
Psychomotor	.48	.54	-.31	.33	.31	
Reasoning	.82	.90	-.44	.67	.68	.43

TABLE 14

COEFFICIENTS OF CORRELATION BETWEEN VARIABLES BASED ON THE CONTROL GROUP POSTTEST DATA

	IQ	MA	M-P	Preschool	Vocabulary	Psychomotor
Mental Age	.89					
Adapted Merrill-Palmer	-.46	-.54				
Caldwell Preschool Inventory	.67	.74	-.52			
Vocabulary	.67	.72	-.30	.60		
Psychomotor	.40	.47	-.21	.32	.27	
Reasoning	.80	.89	-.52	.76	.68	.35

TABLE 15

COEFFICIENTS OF CORRELATION BETWEEN VARIABLES BASED ON THE TOTAL SAMPLE PRETEST DATA

	IQ	MA	M-P	Preschool	Vocabulary	Psychomotor
Mental Age	.89					
Adapted Merrill-Palmer	-.36	-.42				
Caldwell Preschool Inventory	.62	.68	-.38			
Vocabulary	.65	.74	-.40	.54		
Psychomotor	.48	.54	-.34	.36	.35	
Reasoning	.81	.91	-.43	.68	.70	.43

TABLE 16

COEFFICIENTS OF CORRELATION BETWEEN VARIABLES BASED ON THE TOTAL SAMPLE POSTTEST DATA

	IQ	MA	M-P	Preschool	Vocabulary	Psychomotor
Mental Age	.90					
Adapted Merrill-Palmer	-.41	-.46				
Caldwell Preschool Inventory	.72	.79	-.44			
Vocabulary	.61	.68	-.29	.55		
Psychomotor	.39	.44	-.25	.34	.27	
Reasoning	.79	.87	-.48	.75	.62	.34

and control groups. Correlations between the posttest administration of the Preschool Inventory and IQ and MA (.76 and .82, respectively) were considerably higher than pretest scores (.61 and .68, respectively) for the experimental group as can be seen in Tables 11 and 12.

High correlations were also found between reasoning subtest scores and IQ and MA for both experimental and control groups on pretest and posttest administrations. It should be noted that the experimental group made increases significantly greater than those of the control group in the total reasoning factor for all females and in the subtest Comprehension, for both males and females.

The correlation coefficients between psychomotor subtest scores and all others were low (between .54 and -.21). This same low correlation may be noted in norms established for the Stanford-Binet Intelligence Scale, Form L-M.

It will be recalled that correlations between the adapted Merrill-Palmer scores and all others were usually negative because of the method used for scoring the adaptation of the Merrill-Palmer. In general, correlations between results of the adapted Merrill-Palmer Scale and of all other tests were low. This finding was anticipated because of the different phenomena which the various tests attempt to measure. In the present study, a high correlation was not apparent between social factors and intellectual or achievement factors. The low correlation coefficients may support the lack of teacher bias in rating of subjects. It appeared there was no tendency on the part of teachers to rate brighter students as being either more or less adjusted socially.

Intravariable Correlations

Table 17 shows the coefficients of correlation between the results obtained from the two administrations of the three major instruments to each group in the study as well as for the total sample. The administrations were made with an interval of eight months between them.

TABLE 17

COEFFICIENTS OF CORRELATION BETWEEN ADMINISTRATIONS, BY GROUP AND BY TOTAL SAMPLE

Measure	Experiemntal Group	Control Group	Total Sample
Stanford-Binet:			
IQ	.74	.70	.72
MA	.75	.73	.74
Vocabulary	.57	.51	.55
Psychomotor	.46	.37	.41
Reasoning	.76	.72	.74
Adapted Merrill-Palmer	.63	.70	.66
Caldwell Preschool Inventory	.75	.71	.72

By inspecting Table 17, it can be observed that there was relatively high consistency between the two administrations of the tests and subtests to the same subjects. As one would expect, the instruments or subtests having the most "gross" scoring procedures and involving the smallest sample of behavior proved to be the least consistent measurements.

The coefficients of correlation were slightly higher for the experimental group than they were for the control group on all measures except the adapted Merrill-Palmer. It should be borne in mind that it was on this instrument that the greatest changes between the two groups occurred during the experimental period. It was concluded that the test-retest data reflected satisfactory consistency for interpretation of the results of the investigation.

The Nonmatched Group

Description of subsample. At the beginning of the investigation, 29 pairs of subjects were matched upon the basis of sex only. The procedure was employed in order to retain a group of Head Start children, primarily Negro, for whom matches could not be found upon the variable of race. Attrition reduced the sample to 41 subjects and the study was concluded with 24 experimental, or Head Start children, and 17 control, or non-Head Start subjects. White subjects numbered 25; and Negro subjects, 16. All subjects were from low-income families.

Analysis of data by covariance method. Data were obtained for the nonmatched group from the first and second administrations of the three instruments used in the study. The data were analyzed by analysis of covariance in order to ascertain what mean differences, if any, existed between the experimental and control groups upon the seven major dependent variables of the study.

In the first treatment of data by analysis of covariance the means of the pretest scores for the seven dependent variables were controlled. Means and their significance for the variables are shown

in Table 18. (Detailed information regarding the analysis is available in Table 22, Appendix A.) A significant increment was found to exist between the mean IQ of the experimental and of the control group as determined by the adjusted means of the posttests. The mean difference resulted in an F of 6.41 which was significant at the 5 per cent level.

TABLE 18

MEANS AND SIGNIFICANCE FOR MAJOR VARIABLES FOR NONMATCHED EXPERIMENTAL AND CONTROL GROUPS (N=41)

Variable	Experimental Means		Control Means		F
	Pre	Adj. Post	Pre	Adj. Post	
Stanford-Binet:					
IQ	93.17	95.70	95.35	102.19	6.41*
MA	60.08	69.95	62.82	74.43	5.89*
Vocabulary	3.71	5.36	5.00	5.90	.092
Psychomotor	3.71	5.46	4.29	6.12	1.19
Reasoning	20.29	30.19	23.29	32.91	3.55
Adapted Merrill-Palmer	29.79	25.54	26.06	27.21	1.86
Caldwell Preschool Inventory	68.83	78.07	74.41	82.31	5.54*

*Significant at $p < .05$ level of significance

Since IQ as determined by the Stanford-Binet Intelligence Scale, Form L-M, is a function of the MA one would expect a difference to exist between groups on the mean increments in MA when there is a significant difference between the mean IQs of the groups. The mean difference between MAs of the two groups proved to be significant at the .05 level inasmuch as the F value was 5.89.

Significant mean increments, however, were not found between groups upon adjusted posttest means when pretest means were controlled for the variables of vocabulary, psychomotor ability, and reasoning. A negligible F value of .092 was found for the difference between mean increments in vocabulary. In contrast, the F value of 3.55 derived from the difference in the mean increments in reasoning approached 4.10, the value of F required for the 5 per cent level of significance with 38 degrees of freedom.

No significant mean difference between groups was found between the increments in social adjustment as measured by an adaptation of the Merrill-Palmer Personality Rating Scale. An F of 1.86 was obtained. It will be recalled that a significant mean difference in social adjustment was found between the experimental and the control group of the matched sample wher a correlated t was calculated.

An F value of 5.54, significant at the 5 per cent level, was found between the mean increments of level of achievement as determined by the Caldwell Preschool Inventory. The control group, or non-Head Start children, was favored upon level of achievement as well as upon IQ and MA.

Pretest mean IQs controlled. Since the experimental and the control group differed significantly upon IQ, two additional analyses of covariance were made. Both analyses were controlled for pretest intelligence quotients. In one analysis scores obtained from the first administration of an adaptation of the Merrill-Palmer Personality Rating Scale were also controlled, but in the other analysis pretest scores obtained from the first administration of the Caldwell Pre-school Inventory were controlled in addition to intelligence quotients. Pertinent data are presented in Table 19.

TABLE 19

MEANS AND SIGNIFICANCE FOR SELECTED VARIABLES FOR NONMATCHED EXPERIMENTAL AND CONTROL GROUPS WITH INTELLIGENCE QUOTIENTS CONTROLLED

Variable	Experimental Means		Control Means		F
	Pre	Adj. Post	Pre	Adj. Post	
Adapted Merrill-Palmer	29.79	26.53	26.06	25.90	2.00
Caldwell Pre-school Inventory	68.83	78.04	74.41	82.41	5.96*

*Significant at $p < .05$ level of significance

No significant difference was found between the adjusted post means for the difference between the two groups upon social adjustment. The resulting F value was 2.00. A significant difference, however, was found between the adjusted post means for the difference between achievement level of the two groups. An F value of 5.96 was significant

at the .05 level and supported the result that was found between groups of the nonmatched group when pretest scores alone were controlled. The control group was favored in both analyses pertaining to achievement.

Summary of Results

Three major null hypotheses and three subordinate null hypotheses were tested in the investigation. The major null hypotheses assumed that no significant increments in intelligence, social adjustment, and achievement level existed between the experimental and the control group at the end of their year in kindergarten. The subordinate hypotheses pertained to variables related to intelligence and assumed that the groups were not different in respect to vocabulary, psychomotor ability, and reasoning at the end of the kindergarten year.

Matched sample. The following results were found between groups of the matched sample:

1. There was no significant difference between groups upon intelligence as defined by IQs and MAs as determined from the results obtained from the Stanford-Binet Intelligence Scale, Form L-M;

   1-a. There was no significant difference between groups upon vocabulary;

   1-b. There was no significant difference between groups upon psychomotor ability;

   1-c. There was no significant difference between groups upon reasoning;

2. There was a significant difference between groups upon social adjustment as determined from teachers' ratings upon an adaptation of the Merrill-Palmer Personality Rating Scale when the data were treated by the t test for correlated data, but when the data were analyzed by analysis of covariance, controlling on chronological age, a significant difference was not found;
3. There was no significant difference between groups upon level of achievement according to results obtained from the Caldwell Preschool Inventory.

Heuristic Results

Within-group differences for matched sample. Significant mean differences were found within both groups upon:

1. Intellectual level;
   1-a. Vocabulary;
   1-b. Psychomotor ability;
   1-c. Reasoning;
2. Social Adjustment;
3. Achievement level.

Minor results. The following results were found between sub-groups within the experimental and the control group:

1. There was a significant difference between groups on the mean IQs of subjects from the low average category of intelligence, IQs 80-89; the trend was toward the control group;

2. There was a significant difference between groups on the mean MAs of subjects from the low average category of intelligence, IQs 80-89; the direction was toward the control group;
3. There was a significant difference between groups on the mean MAs of subjects from the borderline defective category of intelligence, IQs 75-79; the trend was toward experimental children;
4. There was a significant difference between groups upon selected tests of comprehension; the direction was toward the experimental group;
5. There was a significant difference between groups on the mean reasoning scores of girls; girls from the experimental group appeared to do better;
6. There was a significant difference between the mean reasoning scores of white females and females from other races; white girls from the experimental group appeared to reason better.

Nonmatched group. Findings for the nonmatched subsample were:

1. There was a significant difference between groups in IQ and MA when pretest scores were controlled; control subjects appeared to be superior;
   1-a. There was no significant difference between groups upon vocabulary when pretest scores were controlled;
   1-b. There was no significant difference between groups

upon psychomotor ability when pretest scores were controlled;

1-c. There was no significant difference between groups upon reasoning when pretest scores were controlled;

2. There was no significant difference between groups upon social adjustment when pretest scores were controlled;

3. There was a significant difference between groups in level of achievement when pretest scores were controlled; the direction was toward the control group;

4. There was a significant difference between groups upon achievement level when pretest scores were controlled for IQ and for level of achievement; control subjects appeared to achieve better;

5. There was no significant difference between groups upon social adjustment when pretest scores were controlled for IQ and for social adjustment.

DISCUSSION

The present investigation was delimited to a study of the kindergarten performance of Head Start subjects as compared to that of their non-Head Start counterparts. The study was concluded with 197 pairs of matched subjects in the major sample and 41 subjects in a subsample designated as a nonmatched group. It seemed imperative that the nonmatched group be included because it consisted primarily of Negro children for whom it was impossible to find counterparts upon any matching variable except sex.

The major variables were intellectual ability, social adjustment, and achievement level. Three aspects of intellectual ability were treated as minor dependent variables; they were vocabulary, psychomotor ability, and reasoning.

Since the major objective of the investigation was to study performance in kindergarten, no attempt was made to determine the intellectual level, social adjustment, and achievement level of Head Start children prior to their participation in preschool enrichment activities. That children were not evaluated prior to their enrollment in Head Start may be one of the shortcomings of the investigation.

Between-group comparisons made at the end of the kindergarten year showed that differences between the mean scores of Head Start subjects and non-Head Start subjects were not significant for the major measures of intellectual ability. No significant difference was found between groups upon achievement level, but a significant difference was found between group means for social adjustment when t values were computed.

The mean intelligence pretest scores of both the experimental and the control group of matched subjects were within the normal range of intelligence as determined by the Stanford-Binet Intelligence Scale, Form L-M. Since experimental subjects were pretested either near the end of Head Start activities or immediately after their cessation, the pretest intelligence quotients may have reflected gains associated with Head Start per se. If such gains had already taken place, they not only proved to be stable during kindergarten but also served as a foundation for further gains in intelligence test scores. The Head Start group, as did the non-Head Start group, made highly significant within-group gains (.001 level) upon all intellectual variables as evidenced by the differences between the means of the pretests and the posttests. The highly significant gains in intellectual functioning suggested that perhaps Lincoln children with the exception of the nonmatched group were not as culturally disadvantaged as had been thought. It had been assumed that since one of the matching variables was father's occupation that members of the control group were disadvantaged to the same degree as members of the experimental group. If this assumption were true, evidence from the investigation suggested that disadvantaged children without the benefit of preschool enrichment activities gained as much intellectually as did children who had attended Project Head Start a minimum of six weeks or a maximum of eight weeks. It is possible that a period of six to eight weeks of preschool enrichment is not long enough to make a significant impact upon the intellectual functioning of deprived children.

There is also the possibility that low-income families in Lincoln who did not enroll their children in Project Head Start differed in self-image, motivation, and level of aspiration from the families who enrolled their children. Some indications of such differences seemed to be evident in the responses that parents of potential control subjects made to the investigators' request for subjects. The indications were confirmed by the continued interest and cooperation of parents of subjects who qualified for the control group. Many parents whose children were not selected for the study were frankly disappointed. Several parents who moved from Lincoln prior to the administration of pretests brought their children back for testing. Many parents initiated conferences with the investigators in order to discuss their children's test results. Parents of experimental subjects were interested and cooperative but their personal involvement was noticeably less than that of parents of control subjects. Although the degrees of parental interest and cooperation were estimated subjectively rather than objectively, the investigators' impressions point up the need for parents to be involved directly and actively in Head Start in advisory capacities, in parent groups, as aides, etc.

Although between-group increments or gains for major intellectual variables were not significant, both groups made noticeable gains. The experimental group made a mean gain of 4.30 points in IQ and the control group made a comparable gain of 4.21 points. The gain in intelligence points for Head Start subjects was not as large as gains that have been reported by investigators in other areas of the United States. Perhaps, the difference in results can be explained by the degree

of deprivation and cultural disadvantage experienced by the subjects. It seems reasonable to assume that deprivation in low-income sections of a city the size of Lincoln, Nebraska, may be less severe than that in low-income sections of heavily populated cities. Other studies have not included a control group according to the present investigators' information; therefore, there is no evidence as to the number of IQ points that control subjects might have made had they been included in the studies.

Experimental subjects earned lower total pretest scores upon vocabulary, reasoning, and psychomotor ability than did control subjects but higher posttest scores. Although the differences between means were not significant, the trend was in favor of the experimental group. Head Start experiences may have had an impact upon intellectual functioning.

Experimental subjects of the matched sample made significant gains in some aspects of intellectual ability when stratification was used for subtests as well as for subjects. Statistical treatment of the scores derived from the individual subtests used to obtain a total reasoning score resulted in a highly significant difference (.001) between the means of the experimental and of the control group upon Comprehension, subtests located at Years IV and VII on the Stanford-Binet. One subtest includes such questions as "What's the thing for you to do when you are on your way to school and see that you are in danger of being late?" Since the trend was in the direction of experimental subjects, one may suspect that the experiences of Project Head Start had increased subjects' ability to comprehend and, perhaps,

to assume responsibility. During the testing sessions at the Educational-Psychological Clinic at the University, the investigators observed that experimental subjects showed better self-control during the pretesting period than did control subjects. While waiting either before or after being tested, Head Start children entertained themselves by coloring, playing quiet games, or looking at books; whereas, non-Head Start children tended to amuse themselves by wrestling or running erratically through the waiting rooms. Perhaps, the differences in behavior lay in the fact that Head Start children had already been exposed to school-type activities and that non-Head Start children had not been.

A significant difference (.05 level) was found between the mean reasoning scores of experimental girls and of control girls. The trend was toward the experimental group. A significant difference (.05 level) was also found between the mean reasoning scores of white girls and of non-white girls. The trend was toward white girls from the experimental group. One can hypothesize that girls were developmentally more ready for reasoning activities than were boys and that white girls were less deprived than non-white girls.

Significant differences were found between groups on mean IQs and on the mean MAs of subjects from the low average category of intelligence, IQs 80-89. The trend was toward the control group. Significant differences were also found between groups on the mean MAs of subjects from the borderline defective category of intelligence, IQs 75-79. The trend was toward experimental subjects. Although the number of subjects was small because of stratification, there was sufficient evidence to cause one to look for possible reasons for the differences. How much

does deprivation depress the IQs of children? Are children of low ability depressed proportionately more than children of low average ability? Do Head Start activities make more impact upon children of borderline intellectual ability than upon children with higher abilities? There seemed to be some evidence that children with borderline ability profited most from Head Start.

Results obtained from studying the nonmatched group were somewhat different from those obtained for the matched sample. The nonmatched group was small and at the conclusion of the study contained 24 experimental subjects and 17 control subjects. Since all subjects were from low-income families many of whom were receiving Aid for Dependent Children or county welfare payments, they represented the most severely disadvantaged children from Head Start. Sixteen of the children were Negro for whom it was impossible to find counterparts upon the matching variable of parental occupation. This evidence suggests the degree of the deprivation of the families, for Negro children available to serve as members of the control group came from homes in higher income brackets. Although sex was the only matching variable used in the nonmatched group, the mean pretest intelligence test score for the experimental group was 93.17 as compared to 95.35 for the control group. When the means for the posttest scores were adjusted by analysis of covariance, a significant F value was found between mean IQs and mean MAs of the two groups. Although the trend was in the direction of the control group, the experimental group made appreciable gains.

Teacher's ratings of social adjustment indicated that children who had experienced Head Start preschool enrichment activities made

increments in social development significantly greater than those of children from similar backgrounds who had not participated in preschool enrichment activities. The significant difference between experimental and control groups may have been related to several factors.

One possible explanation is the social orientation of the Head Start curriculum. Through enrichment activities prior to school attendance, children have an opportunity to learn to adjust to a group of their peers and to adults outside the family group. It should be noted from the results of the study that the experimental group made significant increments (.01 level) on the following Merrill-Palmer scales: Compliance with Routine, Physical Attractiveness, and Response to Authority. It appears that the unstructured and informal preschool curriculum prepares deprived children for the more structured routine of the kindergarten.

The significant increment (.01 level) of the experimental group in Physical Attractiveness, as rated by their teachers, may possibly have been due to the emphasis on the development of the self concept in Head Start. Since teachers' ratings of physical attractiveness may be indirectly related to children's bearing--posture and alertness, for example, it is plausible that greater awareness of self-worth and self-identification as a result of Head Start experiences contributed to children's physical appearance.

Enhanced physical attractiveness may have been related also to reports of greater parental interest in the child as a result of the involvement of parents in Head Start activities. It has been noted by teachers and other observers that while Head Start children were

dressed in well-worn, inexpensive clothing, their clothing was clean and they appeared well-cared-for. Because of increased pride in themselves and interest on the part of heretofore unconcerned outsiders, disadvantaged children and their parents were more concerned, no doubt, about their physical appearance. Both of the above possibilities indicate a need for further investigation.

Another factor contributing to the greater increment of the experimental group in social adjustment may have been the predominantly social environment of the kindergarten classroom in the Lincoln Public School system. It might have been anticipated that children who had a highly social preschool enrichment would continue to make gains in social development when follow-up experiences were also predominantly social in orientation. Intellectual and achievement gains may be expected to be more apparent when the curriculum involves greater intellectual and achievement behavior.

If social adjustment is related to intellectual and achievement functioning, follow-up studies of the presently identified group, and others, are needed to establish such a relationship. As the school curriculum changes in focus from social factors in kindergarten to intellectual achievement factors in primary, in upper elementary, and in secondary levels, the experimental group may progress more rapidly than the control group, particularly in subject matter areas.

Contrary to opinions expressed in the early phases of Project Head Start, the experimental group in the present study did not increase significantly in ascendant behavior. The control group, however, did increase significantly in ascendance as rated by their teachers in the

present study. Again, the factor of development of a healthy self concept as a result of Head Start experiences may account for no significant increment on the part of Head Start subjects, but control subjects, experiencing their first opportunities for enrichment in kindergarten, did increase significantly in ascendant behavior.

It has been suggested that teachers rated experimental subjects higher than control subjects on the social adjustment scales because they were more sympathetic to Head Start children. As was previously noted, teachers were aware which subjects had been enrolled in Head Start and which had not. The investigators' impressions are that, in general, kindergarten teachers' attitudes toward experimental subjects tended to be negative rather than positive. This is accounted for by two factors which were national as well as local in scope. Kindergarten teachers seemed wary of Head Start in the formative stages because they feared infringement of their own curriculum and because Head Start was carried on outside the school system. While teachers' biases cannot be excluded as factors in the present study, they would not seem to be significant ones. Additional study is necessary of the same identified groups at a later time when teachers are not as aware of Head Start experiences. In order to understand the degree of teacher bias in the direction of either the experimental or the control subjects studies are needed of groups in which kindergarten teachers are not cognizant of children's prior experiences.

What are the benefits of early social adjustment to academic achievement at later elementary and secondary levels? One of the most valuable and intriguing efforts in follow-up studies of the

identified experimental and control groups will be an investigation of the effects of preschool social adjustment on achievement levels in subject matter areas.

Since the Caldwell Preschool Inventory was in the process of being standardized, it was not known what scores should have been expected upon either the pretest or the posttest. High positive coefficients of correlation were found in this investigation between means upon the Inventory and mean intelligent quotients and mean mental ages for both the experimental and the control subjects in the matched group. It was assumed, therefore, that results obtained from the Inventory were valid.

Between-group differences in means were not significant, but differences in means within groups were highly significant (.001) for Head Start subjects as well as for non-Head Start subjects. The results supported those obtained from within-group differences upon the intellectual variables.

The major finding of the investigation was that children, Head Start and non-Head Start, made highly significant gains in kindergarten in intellectual ability, social adjustment, and achievement. How much did the enrichment activities of Project Head Start contribute to the progress of the experimental group? The question remains unanswered, but the results of the investigation certainly do not justify a conclusion that Head Start experiences were of no value.

Many ideas for follow-up studies have been suggested by this investigation. The study should be replicated with the same subjects at the end of their second grade year. Replication with an experimental

group whose members have been in Head Start for a year should prove to be of value. Studies of parental attitudes, parental involvement in Project Head Start, and parental understandings or lacks of understanding of school expectations would add to a fund of information regarding compensatory education.

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APPENDIX A

TABLE 20

REASONS FOR INVESTIGATORS' FAILURE TO ADMINISTER PRETEST OF STANFORD-BINET INTELLIGENCE SCALE, FORM L-M, TO HEAD START CHILDREN

Reason	Frequency
Inability to locate child	31
Removal of child from Lincoln area	11
Refusal of child to cooperate	7
Insufficient time in program	9
Vacation	2
Total	60

TABLE 21

REASONS FOR INVESTIGATORS' INABILITY TO MATCH HEAD START CHILDREN WHO WERE PRETESTED ON THE STANFORD-BINET

Reason	Frequency
Inability to determine child's school placement	14
Inability to determine parental occupation	12
Child's low IQ precluded his admission to kindergarten	8
Child's failure to enter school	8
Removal of child from Lincoln area	5
Total	47

TABLE 22

SUMMARY OF ANALYSIS OF COVARIANCE FOR THE EXPERIMENTAL AND CONTROL NONMATCHED GROUPS ON THE MAJOR CRITERION VARIABLES WITH MEANS OF PRETEST SCORES CONTROLLED[a]

Source	Adjusted Sum of Squares	Mean Square	F
Stanford Binet:			
IQ			
Error	2460.80	64.58	6.41*
Treatment	413.98	413.98	
MA			
Error	1220.37	32.12	5.89*
Treatment	189.33	189.33	
Vocabulary			
Error	145.22	3.82	.09
Treatment	.35	.35	
Psychomotor			
Error	135.99	3.58	1.19
Treatment	4.26	4.26	
Reasoning			
Error	739.12	19.45	3.55
Treatment	69.01	69.01	
Adapted Merrill-Palmer			
Error	1172.28	30.8	1.86
Treatment	57.27	57.2	
Caldwell Preschool Inventory			
Error	1188.82	31.28	5.54*
Treatment	173.27	173.27	

[a] *df* = 1/38 in each instance

*Significant at $p < .05$ level of significance

TABLE 23

DESCRIPTION OF MATCHED SAMPLE BY INTELLIGENCE LEVELS

Intelligence Level Code	Classification	IQ Range	Frequency
2	Borderline defective	70 -79	20
3	Low average	80 -89	54
4	Lower half of average	90 -99	218
5	Upper half of average	100-109	68
6	High average	110-119	26
		Total	386

TABLE 24

DESCRIPTION OF MATCHED SAMPLE BY PARENTAL OCCUPATIONAL LEVELS

Occupational Level Code	Description	Frequency
1	Ministers, superintendents, gentlemen farmers, etc.	4
3	Grade school teachers, minor business officials, contractors, assistant ministers, etc.	14
4	Stenographers, carpenters, butchers, factory foremen, self-employed plumbers, etc.	72
5	Telephone operators, non-commissioned military personnel with high school education, medium skillworkers, etc.	134
6	Semi-skilled workers, small tenant farmers, assistants to carpenters, truck drivers, etc.	64
7	Janitors, migrant farm workers, heavy laborers, odd-job men, etc.	86
8	ADC and welfare recipients	12
	Total	386

TABLE 25

BETWEEN-GROUP CHANGES IN MEAN INTELLIGENCE QUOTIENTS, MENTAL AGES, VOCABULARY SCORES, REASONING SCORES, AND PSYCHOMOTOR SCORES BY LEVEL OF INTELLIGENCE

Variable	Level Intelligence[a]	Experimental Means Pre	Post	Diff.	Control Means Pre	Post	Diff.	Significance t
Stanford-Binet:								
IQ	2	75.80	89.80	14.00	74.30	84.20	9.90	1.44
	3	84.96	88.81	3.85	85.44	95.81	9.37	-3.05**
	4	99.46	105.01	5.55	100.34	104.92	4.58	.83
	5	113.82	113.23	- .59	113.64	114.02	.38	- .32
	6	126.23	124.52	-1.70	127.92	124.61	-3.31	.30
MA	2	51.40	67.10	15.70	51.20	62.80	11.60	3.18*
	3	55.51	65.03	9.52	57.44	70.77	13.33	-3.24**
	4	63.04	74.59	11.55	65.01	76.21	11.20	.48
	5	71.20	80.79	9.59	72.88	82.41	9.53	.03
	6	77.92	86.15	8.23	79.61	86.23	6.62	.54
Vocabulary	2	2.20	5.40	3.20	2.20	4.20	2.00	1.07
	3	3.03	4.88	1.85	3.59	5.77	2.18	- .85
	4	4.72	6.22	1.50	5.04	6.55	1.51	0.00
	5	6.08	6.94	.86	6.67	7.08	.41	.91
	6	7.46	7.23	- .23	7.69	8.15	.46	-1.09
Reasoning	2	14.80	27.40	12.60	12.50	24.70	12.20	.15
	3	16.29	25.74	9.45	19.11	30.44	11.33	-1.47
	4	23.68	32.93	9.25	25.58	34.03	8.45	1.36
	5	29.67	36.88	7.21	30.47	36.94	6.47	.70
	6	34.53	42.38	7.85	35.15	40.53	5.38	.88
Psychomotor	2	3.00	5.30	2.30	3.40	4.70	1.30	1.86
	3	3.59	5.07	1.48	3.88	5.92	2.04	-1.20
	4	4.44	6.09	1.65	4.86	6.18	1.32	1.39
	5	4.97	6.38	1.41	5.97	6.94	.97	1.24
	6	6.61	7.07	.46	6.23	7.30	1.07	-1.01

[a]Level of Intelligence 2 = 9df 5 = 33 df
3 = 26df 6 = 12 df
4 =108df

*Significant at p < .05 level of significance
**Significant at p < .01 level of significance

TABLE 26

BETWEEN-GROUP CHANGES IN MEAN INTELLIGENCE QUOTIENTS, MENTAL AGES, VOCABULARY SCORES, REASONING SCORES, AND PSYCHOMOTOR SCORES BY SEX

Variable	Sex	Experimental Means			Control Means			Significance
		Pre	Post	Diff.	Pre	Post	Diff.	t
Stanford-Binet:								
IQ	M	100.07	105.00	4.93	100.47	106.07	5.60	.50
	F	100.67	104.22	3.55	101.87	104.40	2.53	.73
MA	M	63.04	74.45	11.41	65.20	77.14	11.94	.62
	F	64.55	74.98	10.43	65.89	75.52	9.63	.92
Vocabu- lary	M	4.56	6.14	1.58	5.06	6.66	1.60	.07
	F	5.00	6.22	1.22	5.20	6.35	1.15	.27
Reason- ing	M	23.61	32.71	9.10	25.40	34.97	9.57	.67
	F	24.19	33.05	8.86	25.40	32.69	7.29	2.51*
Psycho- motor	M	4.24	5.87	1.63	4.83	6.18	1.35	1.17
	F	4.79	6.15	1.36	5.01	6.39	1.38	.09

*Significant at $p < .05$ level of significance

TABLE 27

BETWEEN-GROUP CHANGES IN MEAN INTELLIGENCE QUOTIENTS, MENTAL AGES, VOCABULARY SCORES, REASONING SCORES, AND PSYCHOMOTOR SCORES BY SEX AND BY RACE: WHITE AND NON-WHITE

Variable	Sex	Race	Experimental Means Pre	Experimental Means Post	Experimental Means Diff.	Control Means Pre	Control Means Post	Control Means Diff.	Significance t
Stanford-Binet:									
IQ	M	W	100.44	105.49	5.05	100.69	106.02	5.33	- .20
		N	90.75	92.50	1.75	94.75	107.25	12.50	-2.13*
	F	W	101.15	105.04	3.89	102.58	105.21	2.63	.87
		N	94.00	93.00	-1.00	92.16	93.33	1.17	- .40
MA	M	W	63.35	74.88	11.52	65.31	77.10	11.79	- .30
		N	55.25	63.50	8.25	62.50	78.00	15.50	-2.11*
	F	W	64.79	75.46	10.67	66.31	76.06	9.75	1.02
		N	61.33	68.50	7.17	60.16	68.16	8.00	- .23
Vocabulary	M	W	4.68	6.23	1.55	5.09	6.64	1.55	0.00
		N	1.50	3.75	2.25	4.25	7.00	2.75	- .48
	F	W	5.08	6.34	1.26	5.36	6.51	1.15	.36
		N	3.83	4.66	.83	3.00	4.16	1.16	- .22
Reasoning	M	W	24.00	32.93	8.93	25.47	34.97	9.50	- .80
		N	13.75	27.25	13.50	23.75	35.00	11.25	.71
	F	W	24.42	33.40	8.98	25.73	33.04	7.31	2.51*
		N	21.00	28.33	7.33	21.00	27.83	6.83	.24
Psychomotor	M	W	4.29	5.91	1.62	4.81	6.20	1.39	.95
		N	3.00	5.00	2.00	5.25	5.75	.50	1.26
	F	W	4.80	6.17	1.37	5.07	6.42	1.35	.04
		N	4.66	6.00	1.34	4.16	6.00	1.84	- .41

*Significant at $p < .05$ level of significance

TABLE 28

BETWEEN-GROUP CHANGES IN MEAN INTELLIGENCE QUOTIENTS, MENTAL AGES, VOCABULARY SCORES, REASONING SCORES, AND PSYCHOMOTOR SCORES BY LEVEL OF PARENTAL OCCUPATION

Variable	Level of Occupation[a]	Experimental Means Pre	Post	Diff.	Control Means Pre	Post	Diff.	Significance t
Stanford-Binet:								
IQ	1	107.50	115.00	7.50	107.50	121.00	13.50	-6.00
	3	102.00	107.28	5.28	100.85	109.57	8.72	- .60
	4	104.41	106.86	2.45	103.50	106.55	3.05	- .26
	5	100.13	105.50	5.37	101.67	106.55	4.88	.29
	6	98.56	103.03	4.47	99.50	104.75	5.25	- .37
	7	97.32	101.13	3.81	98.34	102.25	3.91	- .04
	8	107.50	107.66	.16	105.83	104.50	-1.33	.16
MA	1	65.00	74.00	9.00	67.00	84.00	17.00	-1.60
	3	63.71	76.28	12.57	65.00	79.00	14.00	- .38
	4	66.69	76.77	9.97	66.83	77.08	10.25	- .19
	5	63.88	75.52	11.64	66.22	77.35	11.13	.49
	6	62.82	73.50	10.88	64.00	75.96	11.96	- .84
	7	61.46	72.09	10.63	63.95	74.27	10.32	.23
	8	67.33	76.50	9.17	69.83	78.00	8.17	.17
Vocabulary	1	5.50	7.00	1.50	7.00	7.50	.50	1.00
	3	5.14	6.57	1.43	3.42	6.28	2.86	-1.31
	4	5.63	6.52	.88	5.88	6.69	.81	.24
	5	4.77	6.38	1.61	5.17	6.70	1.53	.27
	6	4.59	5.93	1.34	5.28	6.56	1.28	.14
	7	3.97	5.72	1.75	4.58	6.06	1.48	.59
	8	5.00	5.83	.83	4.66	6.83	2.17	- .96
Reasoning	1	27.00	35.00	8.00	27.00	40.00	13.00	-1.25
	3	24.42	34.71	10.29	25.85	35.85	10.00	.12
	4	26.80	34.75	7.95	26.27	33.77	7.50	.45
	5	23.65	33.37	9.72	26.17	35.07	8.90	.90
	6	22.96	31.50	8.54	24.59	33.37	8.78	- .19
	7	22.00	31.20	9.20	23.23	32.06	8.83	.43
	8	26.50	33.33	6.83	30.33	34.66	4.33	.94
Psychomotor	1	5.00	6.50	1.50	5.00	7.50	2.50	1.27
	3	4.71	6.14	1.43	5.28	5.28	0.00	1.24
	4	4.38	6.19	1.81	5.19	6.83	1.64	.40
	5	4.65	6.04	1.39	4.79	6.29	1.50	- .44
	6	4.53	6.06	1.53	4.62	6.15	1.53	0.00
	7	4.27	5.74	1.47	5.00	6.02	1.02	1.17
	8	4.00	5.83	1.83	5.33	6.00	.67	1.94

[a]Level of Occupation

1 = 1 df
3 = 6 df
4 = 35 df
5 = 66 df
6 = 31 df
7 = 42 df
8 = 5 df

APPENDIX B

PROJECT HEAD START

Lincoln, Nebraska

August 4, 1965

Dear Parents:

Will Head Start really make a difference to the children when they go to school next year? All of us in Head Start this summer feel that it will, but we would like to know more definitely. For this reason, the University of Nebraska and the Lincoln Public Schools are cooperating in a research study to determine the effectiveness of Head Start programs.

Some of the information we need is being collected this month through preschool testing. This is being done both in the Head Start Centers and at the University of Nebraska Educational Psychological Clinic at 1620 R. Children are taken to the clinic by an authorized driver for an hour or two and they are enjoying it very much.

We will be keeping in touch with your child next year through his kindergarten teacher. We will want more information next spring and we will be asking your cooperation again at that time.

In addition to children enrolled in Head Start, we need to locate some kindergarteners who were not in our summer program. If you know of some parents of five-year-olds in your neighborhood who might be interested in cooperating with us, would you list their names and addresses below and return them to the teacher.

We can learn much more about the program this summer as we learn from your child. Thank you for this assistance from your family.

Sincerely,

Mrs. Mary Petsche
Director Head Start

Mrs. Mary Krider
Associate Professor Uni. of Nebr.

These families of kindergarteners may be interested in cooperating in your study of Head Start.

1.

2.

3.

THE UNIVERSITY OF NEBRASKA
Lincoln, Nebraska 68508

DEPARTMENTS OF
EDUCATIONAL PSYCHOLOGY AND
HUMAN DEVELOPMENT

Dear Parent:

The University of Nebraska and the Lincoln Public Schools are making a study of abilities and skills of young children. In the study a series of pleasant tasks will be presented to each child.

By permitting your child to participate you will be making a very important contribution not only to your own child's future progress but also to the welfare of other children.

In order that we may make up a list of children whose parents are willing for them to take part in the study, we are asking your permission to include your child. Transportation will be provided to and from the University. We shall appreciate your help and cooperation and know that your child will find this an interesting and pleasant experience.

We would like to see your child once before school begins on September 13. Will you please sign the attached form and return it to us in the enclosed envelope as soon as possible.

Very sincerely,

Mary A. Krider
Mary Petsche
University of Nebraska
Telephone: 432-6176

Date_____

I hereby grant my approval for my child _____ to participate in the above mentioned study of abilities and skills of young children.

Signed_____ Phone_____

Address_____ Child's School_____

Occupation of father_____

Has your child attended nursery school: Yes___; No____

THE UNIVERSITY OF NEBRASKA
Lincoln, Nebraska 68508

DEPARTMENTS OF
EDUCATIONAL PSYCHOLOGY AND
HUMAN DEVELOPMENT

Dear Parent:

You will recall that when you gave permission for your child to participate in the Head Start study of the abilities and skills of young children that we mentioned that we planned to see your child again this spring. This study, as you remember, is being conducted by the University of Nebraska and the Lincoln Public Schools. It is now time to see the children again.

By permitting your child to participate you are making a very important contribution not only to your own child's future progress but also to the welfare of other children. We do appreciate your cooperation.

Your child will be seen at the University. Insured transportation will be provided to and from your home. Your child will be away from home for approximately two hours. The tasks and games which your child will enjoy, and the transportation are provided free of charge. Judging from our activities last summer, we know that your child will again find this an interesting and pleasant experience.

Since we plan to see children beginning the latter part of March, will you please complete the following information and return the form as soon as possible to us in the enclosed envelope. We will phone or write you to schedule a definite appointment for your child.

Very sincerely,

Mary A. Krider
Mary Petsche
University of Nebraska
Telephone: 432-6176

Name _____ Home phone or other _____

Address _____ Child's School _____

Child attends kindergarten: Morning ( ) or Afternoon ( )

PLEASE CHECK ONE

Signed _____

Child's Name_____

DATA ON STANFORD-BINET

	Pre	Post	Diff	Sign Diff
Vocabulary				
Psychomotor:				
III Circle (0,1,2,3)				
V Square (0,1,2,3)				
VII Diamond (0,1,2,3)				
Total (9-0)				
Reasoning:				
Comprehension				
Year IV (0,1,2)				
Year IV-6 (0,1)				
Year VII (0-6)				
Total				
Opposite Analogies				
Year IV (0-5)				
Year VI (0-4)				
Year VII (0-4)				
Total				
Pictorial				
Similarities and Differences				
Year IV-6 (0-9)				
Year V (0-9)				
Total				
Similarities and Differences				
Year VI (0-3)				
Year VII (0-4)				
Year VIII (0-4)				
Total				
Picture Absurdities				
Year VII (0-5)				
Verbal Absurdities				
Year VIII (0-4)				
Total tasks:				
Total Comprehension				
Total Opposite Analogies				
Total Pictorial Similarities and Differences				
Total Similarities and Differences				
Picture Absurdities				
Verbal Absurdities				
Reasoning Total				

APPENDIX C

MERRILL-PALMER PERSONALITY RATING
Schedule 1

Date_____

Child's Name_____Rated by_____

ASCENDANCE-SUBMISSION

_____Submits to any child who takes the initiative.
_____Even submits to younger children
_____Submits to children of his own age (either sex)
_____Dominates children less mature than himself
_____Dominates children more mature than himself
_____Dominates children of his own age (either sex)
_____Will submit to a specific child only
_____Submits occasionally to some other child
_____Dominates a specific child only
_____Submits to a leader only after a struggle to dominate
_____Is a follower in one specific group only
_____Occasionally dominates a group
_____Dominates a specific group only
_____Usually leads a small group
_____Usually dominates a large group
_____Decides who shall participate in the group activities
_____Can organize the activities of a group to carry out a definite purpose
_____Is a leader of any group
_____Directs all activity about him
_____Leads or follows as the occasion demands
_____Neither leads nor follows; plays alone
_____Dominates other children by having greater material possessions which they covet
_____Other children make many appeals to him for information
_____Dominates other children through his ability to talk effectively
_____Other children appeal to him to make decisions for the group
_____Dominates other children through their love or admiration for him
_____Dominates other children through his wealth of ideas
_____Definitely schemes to get others to carry out his plans
_____Gives commands with an air of finality
_____Helpless unless someone organizes activity for him
_____Hesitates to initiate activity
_____Hesitates to make suggestions to other children
_____Usually follows the ideas of others for activity
_____Usually has his own ideas for activity
_____Can take the initiative if it is absolutely necessary
_____Usually takes the initiative
_____Seeks the approval of the leader before he acts
_____Does not push the issue in case of opposition
_____Stands aside to let others participate
_____Fights for his place as leader
_____Opposition spurs him on to greater activity
_____Refuses to cooperate unless he is the leader
_____Insists that other children do as he wishes
_____Does not defend his own rights with other children
_____Easily led into mischief by others
_____Much rivalry with other children
_____Fails to secure cooperation when he tries to direct activities
_____Gets willing cooperation easily

Most Ascendant | | | | | | Most Submissive

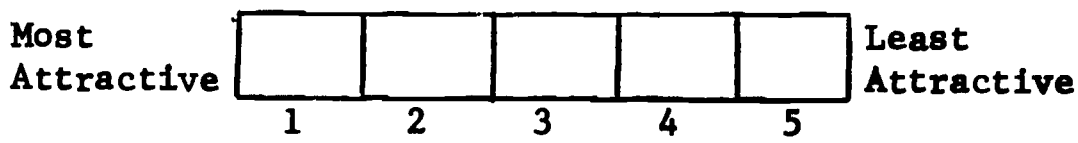
1 2 3 4 5

Name_____

Schedule 2

ATTRACTIVENESS OF PERSONALITY

_____Unusually happy disposition
_____Nearly always smiling
_____Smile lights up his whole face
_____Has a contagious laugh
_____Almost always seems unhappy
_____Extremely disagreeable manner
_____Has an unusually good sense of humor
_____Has a fairly good sense of humor
_____Has a way of making an appeal with his eyes
_____Has a pleasing manner of speech
_____Thoughtful of others
_____Sympathetic nature
_____Inconsiderate of others
_____Not affectionate
_____Extremely selfish
_____Moderately selfish
_____Polite
_____Rude
_____Mischievous
_____Brave when hurt
_____Very babish when hurt
_____Truthful
_____Very persistent
_____Gives up readily
_____Makes excuses
_____Seldom cries
_____A good sport
_____A poor sport
_____Domineering
_____Deceptive
_____Impulsive
_____Very variable
_____Rough and ready
_____Very stable
_____Forgiving nature
_____Very quarrelsome
_____Very stubborn
_____Wanders around aimlessly
_____Self-conscious
_____Nervous in manner, overtalkative over-anxious, etc.
_____Very negativistic
_____Is on the defensive all the time
_____Happy go-lucky
_____Very methodical
_____Confides in adults
_____Intelligently cooperative
_____Often shows off or acts silly
_____Repels friendly advances
_____Sulks when not given his own way
_____Makes pleasant conversation with adults
_____Makes an effort to help adults
_____Egotistical
_____Repressed
_____Unaffected, spontaneous,natural
_____Unpopular with other children
_____Imaginative
_____Lacks imagination
_____Adapts easily to a new situation
_____Eager to try new things
_____Not much interested in new activities
_____Seems to have a plan for every minute
_____Brimming over with ideas for activity
_____Fairly enthusiastic in work or play
_____Vivacious
_____Displays no enthusiasm
_____Plays or works vigorously
_____Moderately energetic
_____Passive
_____Listless
_____Haphazard methods
_____Extremely timid physically
_____Lacks self-confidence

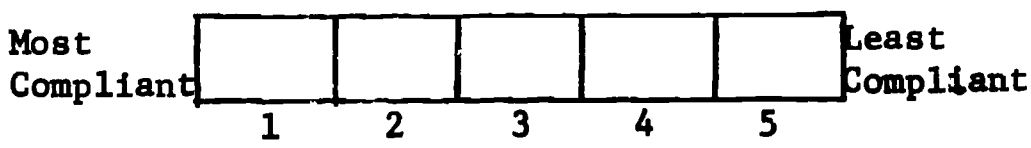


Name_____

Schedule 3

COMPLIANCE WITH ROUTINE

_____Adjusts immediately to the daily routine
_____Objects violently to routine activities
_____Always goes through the daily procedure willingly
_____Usually goes through the daily procedure willingly
_____Has to be constantly urged to carry out routine activities
_____Takes a long time to adjust to the daily routine
_____Tries to prevent other children from carrying out the routine activities
_____Quietly enjoys routine activities
_____Accepts the routine as a matter of course
_____Responds readily to direction in the day's routine
_____Likes to assist the adult in routine tasks
_____Cooperates or not in routine, according to his mood
_____Acts silly at the lunch table
_____Refuses many foods
_____Often cries during nap period
_____Objects to being examined by the nurse
_____Talks and laughs with adjacent children during rest period or nap
_____Proceeds as usual with routine in the presence of visitors
_____Presence of visitors upsets his routine
_____Presence of a specific child upsets his routine
_____Is emotionally upset upon leaving parents
_____Is businesslike and systematic in endeavoring to carry out routine activities
_____Dawdles over routine activities
_____Carries out routine tasks in a haphazard manner
_____Makes a routine of his play activities
_____Always cooperates in trying to keep the schoolroom neat and clean
_____Usually cooperates in trying to keep the schoolroom neat and clean
_____Occasionally puts things away
_____Seldom cooperates in trying to keep the schoolrooms neat and clean
_____Never puts things away

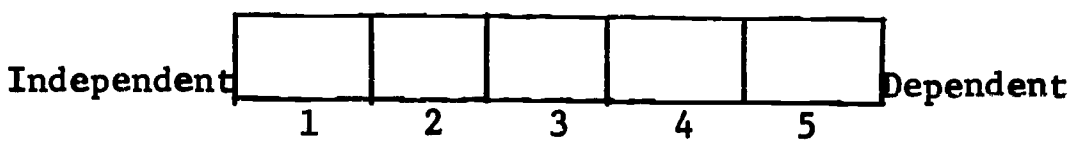


Name_____

Schedule 4

INDEPENDENCE OF ADULT AFFECTION OR ATTENTION

_____Perfectly natural in the presence of adults
_____Always conscious of adult's presence
_____Matter of fact in his relations with adults
_____Has defiant attitude toward adults
_____Avoids adults as much as possible
_____Insists that a specific adult assist him
_____Has great admiration for particular adults (hero worship)
_____Independent of adult in overcoming difficulties
_____Dependent upon adult for ideas and plans for work or play
_____Seeks adult aid at every move
_____Resents aid from adults
_____Pays no attention to visitors
_____Makes friendly advances toward visitors
_____Acts silly in presence of visitors or newcomers
_____Presence of parent (underline: father, mother) upsets the child's regular routine
_____Leaves parent (underline: father, mother) in a matter-of-fact manner
_____Is emotionally upset upon leaving parents (underline: mother, father)
_____Bids for attention from adults
_____Cries often to secure adult attention
_____Does his best only when praised by adults
_____Not dependent upon praise from adult to do his best
_____Seems worried that adults will not like him
_____Expects adults to feel sorry when he is not good
_____Forms adult attachments often
_____Craves and definitely seeks affection from adults
_____Asks for physical demonstration of affection from adults
_____Gives physical demonstration of affection
_____Shows affection toward adults
_____Usually affectionate but bursts occasionally into "I hate you"
_____Resents affection from adults

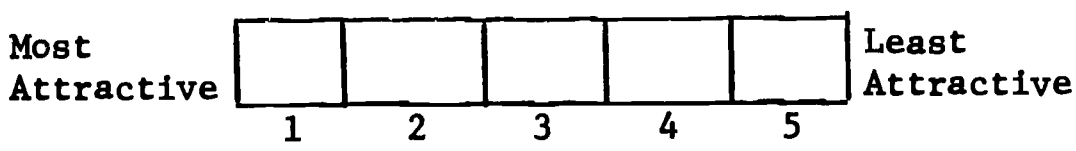


Name_____

Schedule 5

PHYSICAL ATTRACTIVENESS

_____Good body proportions
_____Poor body proportions
_____Serious deformity
_____Legs bowed
_____Well-shaped head
_____Peculiarly shaped head
_____Very wide forehead
_____Very short, thick neck
_____Features strikingly beautiful
_____Beautiful features
_____Ordinary features
_____Homely features
_____Repulsive features
_____Square jaw
_____Very prominent cheek-bones
_____Broad nose
_____Very long face
_____Very thin lips
_____Very thick lips
_____Protruding chin
_____Receding chin
_____Crooked teeth
_____Face badly scarred
_____Unusually pleasant facial expression
_____Exceptionally beautiful eyes
_____Unusually disagreeable facial expression
_____Exceptionally beautiful eyes
_____Expressive eyes
_____Very large eyes
_____Ordinary eyes
_____Eyes seem too far apart
_____Very small eyes
_____Eyes seem too close together
_____Eyes slightly crossed
_____Expressionless eyes
_____Exceptionally beautiful hair
_____Hair is neat and clean
_____Care of hair is neglected
_____Hair extremely unattractive
_____Beautiful, smooth skin
_____Coarse skin
_____Skin not clear
_____Sallow complexion
_____Rosy cheeks
_____Looks very healthy
_____Very thin and emaciated
_____Stands erect
_____Seems to have poor posture
_____Walks with ease and grace
_____Has a peculiar walk
_____Soft, musical voice
_____Ordinary speaking voice
_____Harsh voice
_____Loud, harsh laugh
_____Whining voice
_____Very attractive clothes
_____Meticulously neat and clean
_____Wears ordinary clothes
_____Clothes do not fit well
_____Very untidy about clothes
_____Body and clothes usually clean
_____Hands, face, and neck usually clean
_____Hands and face usually dirty
_____Usually has a dirty neck
_____Body seldom clean
_____Nose is usually running
_____Body always has an offensive odor

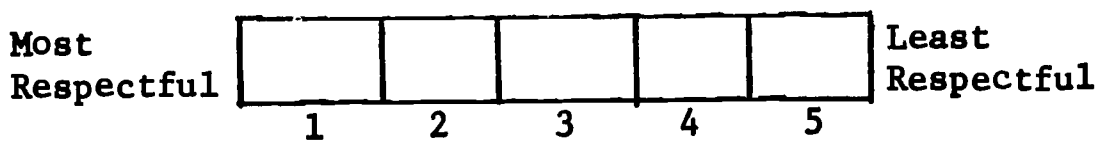


Name_____

Schedule 6

RESPECTS FOR PROPERTY RIGHTS

_____Distinguishes between his own property and that of others
_____Takes toys belonging to other children from their lockers
_____Takes school property or that of other children home
_____Realizes that school property belongs at school
_____Does not take possessions of other children without permission
_____Understands meaning of waiting his turn
_____Wants toy or play materials as soon as he has the desire regardless of whether or not it is his turn
_____Takes good care of school property while using it
_____Rough and destructive with school property
_____Tries to take equipment away from other children
_____Wants to keep a particular piece of equipment even if he is not using it
_____Gives up equipment to other children as soon as he has finished with it
_____Usually desires equipment being used by others rather than what he has
_____Resorts to slyness to get equipment being used by others
_____Hits or knocks down a child to get equipment from him
_____Monopolizes certain pieces of equipment
_____Has no sense of property rights
_____Has extreme sense of property rights and a deep desire to see these rights enforced
_____Extremely destructive of toys and equipment in school
_____Shows extreme consideration for school property
_____Genuinely sorry when he has destroyed another's possessions
_____Takes pleasure in destroying the possessions of others
_____Careless with his own possessions
_____Takes good care of the possessions of other children
_____Careless when using the possessions of other children
_____Plans to take possessions of others even when he is told not to

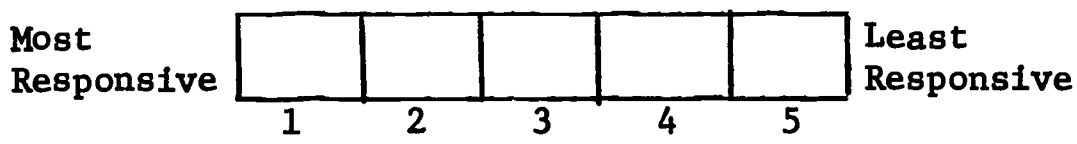


Name_____

Schedule 7

RESPONSE TO AUTHORITY

_____Attempts to change conversation from suggested activity to other channels
_____Adds cooperative additions to the suggestion
_____Resists suggestion
_____Plans evasion
_____Proud of his cooperation
_____Lags in following suggestion
_____Responds without undue delay to authority
_____Cries if has to submit to authority
_____Runs away if called
_____Comes quickly if called
_____Thinks immediately of arguments against doing suggested activity
_____Contemplates suggestion a long time before acting upon it
_____Resists when required to do something new
_____Says "no" but does suggested activity
_____Says "yes" but does not do suggested activity
_____Frowns, shrugs shoulders, pouts, or stamps foot when suggestion is made
_____Resists only when in a particular mood
_____Pretends not to hear
_____So absorbed in his own thoughts that does not comprehend
_____Defies authority
_____Accepts any command without question
_____Experiments with new authority to see how far he can go
_____Rebels physically: temper-tantrum, hitting, kicking, etc.
_____Pretends absorption to evade suggestion
_____Cooperative and responsible
_____Tries to get task done by the person who suggests it
_____Follows suggestion only while teacher is in sight
_____Resists if suggestion is not about the things he himself has planned



Name_____

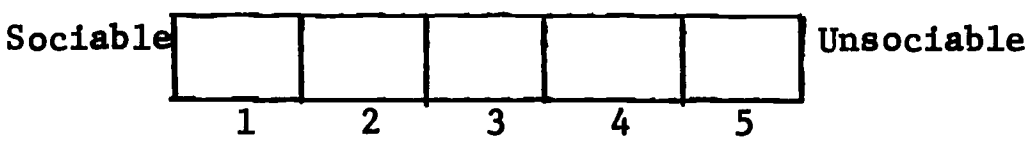
Schedule 8

SOCIABILITY WITH OTHER CHILDREN

_____Makes friends easily with other children
_____Finds it difficult to approach other children and make friends
_____Makes friends with any child who happens to be around him
_____Resents interest shown by other children; wants to be left alone
_____Has a particular friend (underline: own sex, opposite sex) whom ne admires very much (hero worship or crush)
_____Tries to make entry into group of children but fails
_____Other children refuse to play with him
_____Is ridiculed or "picked on" by other children
_____Unhappy if he is not playing with other children
_____So absorbed in his own ideas that he pays no attention to other children
_____Plays only with a gang or group of specific children, refusing to play with others
_____Contributes to the ideas of the group though not a leader (coop. comp.)
_____Refuses to cooperate with other children unless he is the leader
_____Hesitant in making suggestions to other children
_____Interest of other children spurs him on to activity
_____Assumes protective attitude toward other children (underline, same sex, opposite)
_____Usually pleasant with other children
_____Often abrupt and surly with other children
_____Has a pleasant manner of securing cooperation from other children
_____Has strong likes and dislikes for other children
_____Has rather placid attitude toward other children; neither like nor dislike them to any degree
_____Quarrels with other children only over serious matters
_____Quarrels with other children often over trivial matters
_____Seldom quarrels with other children over trivial matters
_____Picks on one particular child
_____Rough and mean with other children
_____Teases or torments younger children
_____Hurts other children often through carelessness
_____Impatient with other children
_____Enjoys seeing other children reprimanded
_____Ridicules other children
_____Very critical of other children
_____Is a good sport when he loses to some other child
_____Sympathetic toward other children
_____Affectionate toward other children
_____Very thoughtful of other children
_____Resents aid from other children
_____Forgiving of other children who have hurt him, taken his belongings, etc.
_____Talks to other children a great deal

Schedule 8
(continued)

_____Seldom talks to other children
_____Cries easily when playing with other children
_____Generous in letting other children share activities and possessions
_____Selfish with other children; does not want to share possessions or let them enter into his activities
_____Does not want other children to get attention from adults
_____Attention from other children leads him to "show off" or act silly
_____Jealous if other children play with a specific child whom he likes
_____Not jealous if other children play with his particular friends
_____Tries to help the smaller children
_____Does not respond to friendly advances



Schedule 9

TENDENCY TO FACE REALITY

_____Faces the issue squarely
_____Concentrates his energy to accomplish a difficult task
_____Meets situations in a quiet, matter-of-fact manner
_____Has a wide range of constructive interests
_____Does the hardest part of a task first
_____Dawdles to avoid a difficult task
_____Worries over things that may never happen
_____Does not worry other things that may never happen
_____Worries over trivial matters
_____Does not worry over trivial matters
_____Feels unduly disappointed when his plans do not go right
_____Grieves too much over what he has lost
_____Accepts necessary facts as a matter of course
_____Refuses to accept certain necessary facts
_____Does the best he can with what he has
_____Does not realize his own limitations
_____Finds it difficult to accept his own limitations
_____Not very self-critical
_____Thinks he should always have the center of the stage
_____Recognizes and accepts the superiority of another child
_____Accepts the fact that he cannot excel in every type of activity
_____Appreciates and adjust to a good authority
_____Does not appreciate or adjusts to a good authority
_____Assumes attitude of defiance when not accepted by the group
_____Accepts just criticism willingly
_____Finds it difficult to accept just blame for his faults
_____Expects to be excused from a difficult task
_____Regresses to babyish behavior in the face of difficulty
_____Expects to be pitied in the face of difficulty
_____Will not admit failure or defeat
_____Always has an alibi
_____Does not make excuses for his shortcomings
_____Becomes antagonistic when he fails
_____Demands too much praise and bolstering to accomplish much
_____Expects to succeed at a task
_____Quietly accepts success
_____Knows when he has failed at a task
_____Knows when he has done a task well
_____Sees his faults or failures in their true light
_____Tries to compensate for his shortcomings by excessive activity or animation
_____Substitutes day-dreaming for real effort
_____Does not lose his sense of reality even in imaginative play