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EVALUATION OF CHANGES OCCURRING IN CHILDREN WHO PARTICIPATED IN PROJECT HEAD START.

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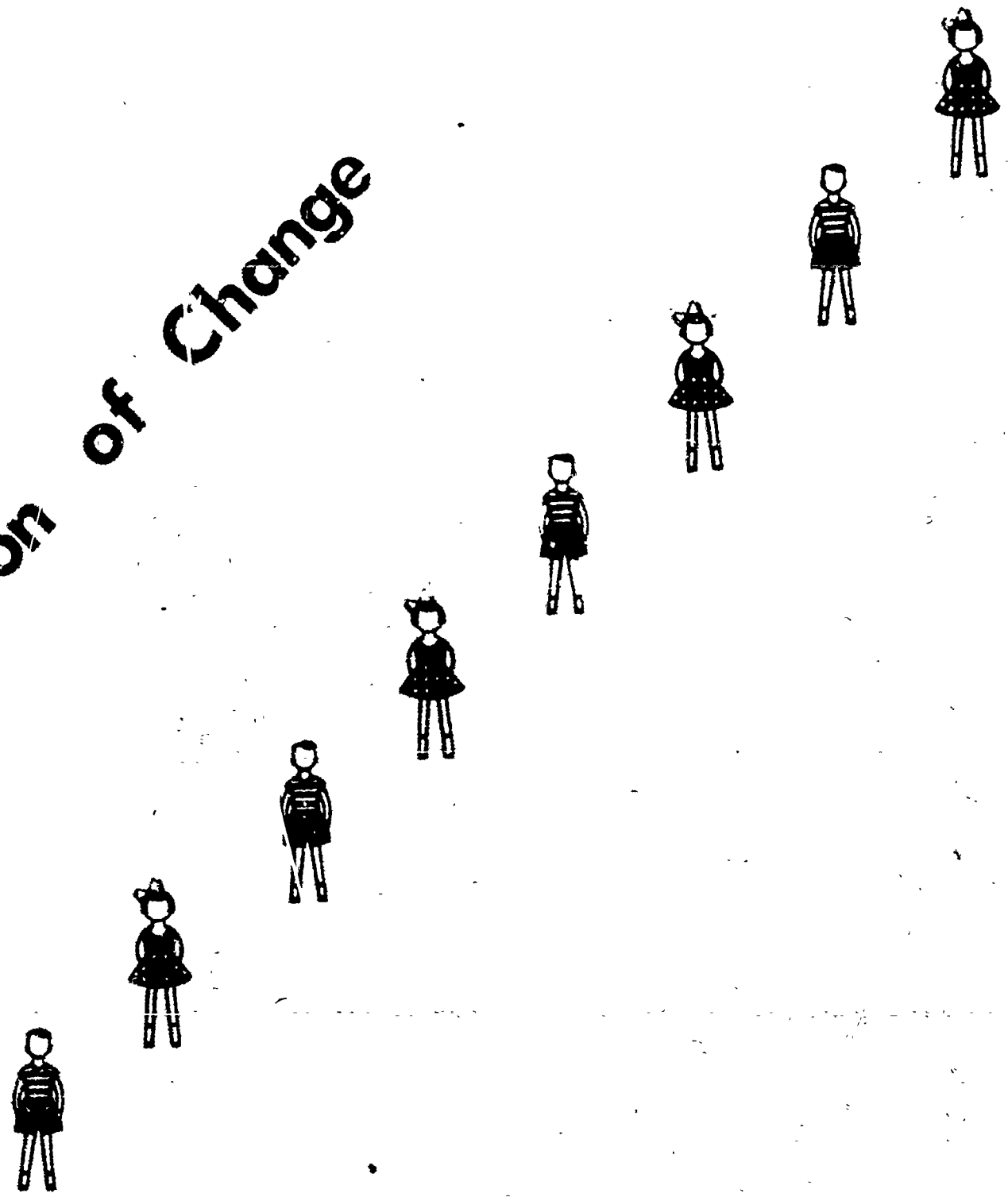
THE ENVIRONMENT OF CHILDREN FROM LOW SOCIO-ECONOMIC LEVELS MILITATES STRONGLY AGAINST THEIR SUCCESS IN SCHOOL. TO HELP THWART OR REVERSE THE DEFICIENCES OF DISADVANTAGED YOUTH, THE PRESCHOOL ENRICHMENT PROGRAM WAS CREATED. THIS DOCUMENT IS AN EVALUATION OF A 1965 SUMMER HEADSTART PROGRAM FOR 4- AND 5-YEAR-OLDS IN KEARNEY, NEBRASKA. TESTS WERE ADMINISTERED TO HEADSTART CHILDREN AT THE BEGINNING OF THAT PROGRAM AND AGAIN NEAR THE END OF KINDERGARTEN. THE RESULTS WERE COMPARED WITH TEST SCORES OF A MATCHED GROUP OF NON-HEADSTART CHILDREN TESTED AT THE BEGINNING AND END OF KINDERGARTEN. THE PRIMARY PURPOSE OF THIS COMPARISON WAS TO SEE IF THE ENRICHMENT PROGRAM PLUS KINDERGARTEN RESULTED IN GREATER ACHIEVEMENT THAN KINDERGARTEN, ALONE, WOULD HAVE PRODUCED. THE GENERAL CONCLUSION FROM THE RESULTS OF THE TESTS OF (1) INTELLECTUAL ABILITY, (2) VISUAL-MOTOR PERCEPTION, (3) ACHIEVEMENT, AND (4) SOCIAL GROWTH AND ADJUSTMENT WAS THAT THE FORMER COMBINATION PRODUCED GREATER GAINS. STATISTICALLY SIGNIFICANT DIFFERENCES IN FAVOR OF THE EXPERIMENTAL GROUP WERE ACTUALLY OBTAINED ONLY WITH RESPECT TO THE TEST OF INTELLECTUAL ABILITY, BUT FAVORABLE TRENDS WERE OBSERVED GENERALLY. A SECONDARY PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE EFFECT ON DISADVANTAGED CHILDREN'S RESPONSES OF USING LOW FIDELITY STIMULI OR HIGH FIDELITY STIMULI IN VARIOUS PERCEPTUAL-MOTOR EXERCISES. THE RESULTS WERE INCONCLUSIVE. THE DOCUMENT ALSO INCLUDES A BREIF REVIEW OF THE LITERATURE ON ACHIEVEMENT BY THE CULTURALLY DEPRIVED, AND SEVERAL CASE STUDIES OF CHILDREN WHO PARTICIPATED IN THE HEADSTART PROGRAM. (WD)

Project Head Start

Kearney, Nebraska

Evaluation of Change



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by

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Kearney, Nebraska
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CHAPTER I

INTRODUCTION

Purpose:

The purposes of this study were to assess the effectiveness of the Head Start preschool enrichment program in preparing four-and five-year-old children for school experiences and to evaluate certain perceptual characteristics of the disadvantaged children who had been enrolled in this program. This research was a continuation of evaluations initiated during the Head Start Project in Kearney, Nebraska, during the summer of 1965.

Background for the study:

American education has always been beset by challenges in the fulfillment of the Jeffersonian ideal that the United States offer public education to all her youths. Currently the most serious and significant of these challenges is probably the education of the culturally deprived. Almost characteristically, schools have neglected the children from poor home backgrounds, both urban and rural. By and large these youngsters have been viewed as drawbacks to the morale and achievement levels of the school. This point of view has contained no small amount of resentment which in turn has been reflected by the children involved. They have not learned to see much value in the formal academic routines so removed from their frames of reference. This has been accompanied by

frequent humiliating failure and a breeding of hostility toward the authorities of the school. The outcome of all this has been an ever increasing breach between the teachers and those pupils whose need for them is most critical.

That such a situation might occur should come as no surprise in view of the components of the American schools. Watson in his forward to Riessman's book, The Culturally Deprived Child (42, p. 4) referred to American public schools as a curious hybrid managed by school boards drawn largely from upper-class circles, manned by teachers coming generally from middle-class backgrounds, and attended mostly by children from the working class. Wide differences exist in the environments in which these three groups of persons move; their language, values, and mannerisms diverge considerably.

This challenge has existed for all time, but previously there has been little pressure to arrive at a solution for coping with the situation. As long as the economy was one in which ample opportunity existed for unskilled workers with a minimum of education, there was considerably less motivation to be concerned with children who did not respond well to the school situation. Instead, the attention of the schools was directed toward the continual weeding out of the less able and the selection of the more capable who could respond well to the program which tradition had devised. School people

have been notably deaf to the by-products of this selective process and to the effects upon the lives of those who could not maintain themselves within the selected elite.

The school children who have responded least well to this traditional "weeding process" frequently come from the culturally deprived groups. According to Riessman, (42, p. 3) the term "culturally deprived" refers to those persons who have not received the benefits of such aspects of the middle-class culture as education, books, and formal language. He specifies that the culturally deprived are not without a culture, but have a culture of their own which has grown out of their coping with a difficult environment. When the children from culturally deprived families come to school they bring with them the attitudes implanted by the childrearing procedures of their parents.

These attitudes create an interesting mosiac. In many ways the culturally deprived person is old-fashioned and superstitious. Although there are many areas in which he is poorly informed and holds no opinions, he has firm convictions about certain other beliefs such as punishment, diet, customs, the role of woman, etc. He holds little quarter for progressive education with its emphasis on individualism, self-expression, and creativity. With this de-emphasis on the individual goes the feeling that it is the world, and not him, who is responsible for

his misfortunes. Consequently, he experiences little self-recrimination with its accompanying restraint of aggression. This de-empnasis on individualism extends also to being unattracted to a middle-class style of life and the accompanying regard for status and self-betterment. The culturally deprived person is more concerned with "getting by" than "getting ahead". This leads to embracing values which are pragmatic and anti-intellectual. Only things that work, including education, are good; but if it can't do something, it is without value. Abstractions therefore are held in little esteem and those engaged in abstract thinking, intellectuals, are to be despised and discredited. "The anti-intellectualism of the under-privileged individual is one of his most significant handicaps. It is expressed in his feeling that life is a much better teacher than books---..." (42, p. 29).

In addition to his anti-intellectual attitudes, the child from the culturally deprived home may also bring certain deficits to school. Unlike the middle-class child, he does not live in an "educational tradition". Although the parents of the culturally deprived most frequently respond that the thing they want most for their children is a good education, they seldom enjoy much beyond an elementary schooling themselves. Consequently they are ill-equipped to provide their children with meaningful experiences in books, or a rich language

background. The time orientation among the culturally deprived is characteristically for the present, a poor basis for the motivation necessary to see oneself through a long educational career. The culturally deprived child frequently has a deficient appreciation of his own worth as an individual. Through his parent's eyes as well as through the mass media, he has been exposed to a perception of self that is derogatory and demeaning.

Other physical and psychological deficits experienced by the culturally deprived child are poor health, improper diet, the effects of frequent moving, and noisy homes lacking a sense of privacy. The incidence of almost every childhood malady is higher among these youngsters. (Anemia is one of the frequent diagnoses.) Lack of identification with a community setting and its correlate, emotional security, also detract from the child's sense of adequacy in the institutional setting.

The recognition of the effects of these self-defeating attitudes toward intellectualism and of the deficits which are inherent in the life-style of these children has been the source of concern for responsible persons for some time. In school particularly the underachievement, negativism, hostility, and eventual early drop-out incidence have been observed by conscientious educators. In recent years it has become apparent that what was needed were special <u>transitional</u> techniques to bring the culturally deprived child into the academic

mainstream. It was at this point that the concept of preschool enrichment program was visualized.

Since the early years of this decade, preschool programs have been developing in larger Eastern cities where the culturally deprived children existed in quite large groups. Reissman (42, p. 1) estimated that by 1960, one in three children in the fourteen largest cities of the United States was culturally deprived. These programs attracted the attention of the persons who concern themselves with child welfare and development and with attempts to alter the traditions of poverty among the under-privileged. Finally a planning committee was appointed in 1964 to make recommendations for an action program. In February, 1965, a report was presented to S. Shriver and to the President which reported in part:

> "Within recent years there has been experimentation and research designed to improve opportunities for the child of poverty. While much of this work is not yet complete there is adequate evidence to support the view that special programs can be devised for these four and five year olds which will improve both the child's opportunities and achievements.
>
> It is clear that successful programs of this type must be comprehensive, involving activities generally associated with the fields of health, social services, and education. Similarly it is clear that the program must focus on the problems of the child and parent and that these activities need to be carefully integrated with programs for the school years..." (41, p. 324).

This was not the first time preschool education for four and five year olds had been recommended. Both the 1940 and 1950 White House Conferences on Children and

Youth suggested the undertaking of similar programs. However, because of current legislation, it was possible in the summer of 1965 to actualize the preschool program for 561,000 children.

Need for the Study:

In terms of the negative attitudes and the deficits possessed by the culturally deprived child and his family, a series of objcctives were established to guide the mainstream of the programs. At the local level they usually were expressed in a way similar to those of the Memphis and Shelby County schools. (43, p. 341)

To promote the child's health, physical growth and motor development.
To provide a good atmosphere for learning and growth--a climate that fosters a feeling of belonging, success and friendliness.
To strengthen inner emotional controls.
To encourage self-liking and self-confidence in order to increase the sense of dignity and self-worth within the child and his family.
To expand the child's social contacts.
To help the child adjust to group living and to our domestic way of life.
To discover the child's interests and aptitudes so he may be afforded the fullest opportunities for realization of his capacities.
To broaden intellectual horizons through providing a variety of first-hand experiences.
To help children observe, investigate, seek, and acquire information and think critically.
To increase independence in meeting and solving problems.
To provide satisfying aesthetic experiences.
To encourage creative expression.
To develop and encourage good work habits.
To develop language skills with particular emphasis on oral communications and expression.
To lay foundations for reading, writing, and number work.

Objectives are expressions of plans for change to be

brought about in learners; they have their origins in the observed needs of the children. Having identified these needs and expressed the plans for meeting these needs in the form of objectives, a program was designed which was intended to bring about the desired changes. The step remaining is that of evaluation: Did the program produce the changes which were desired? Evaluation of changes produced in the Head Start enrollees and their controls is the purpose of this study. Has the program served the purposes for which it was established?

The second objective of this study was the evaluation of certain visual perception characteristics with regard to stimulus fidelity. It was aimed contributing objective information relative to the answering of the question: To what sorts of visual stimuli can the culturally deprived child best respond? The significance of this question lies in its relevance for the making of inferences pertinent (1) to intelligence testing where black and white line drawings (low fidelity stimuli) are usually used, and (2) to the types of learning materials which should be most meaningful for instructional purposes.

CHAPTER II

REVIEW OF RELATED LITERATURE

The studies related to the purposes of this research were classified according to the variables which were under inspection. The first group of investigations considered were those related to changes in the level of intellectual functioning of culturally deprived children. Quality of perceptual skills, particularly visual-motor abilities, were surveyed next. The third group of studies pertained to the achievement of culturally deprived children; especially relevant were those concerned with early reading skills. The last area contained in the primary purpose of this research was social growth and development. Reviewed at this point were studies involving children from pre-schools and the early elementary grades.

There were no studies available in the published literature relevant to the second purpose: differential responses to visual stimuli of variable fidelity.

Intellectual Functioning

Historically, the first approach to a determination of the efficacy of pre-school programs was to measure the changes in intelligence scores of children who had attended a pre-school program. In general, two designs have been used to make this assessment of change. Many of the studies evaluated the children before and after pre-school attend-

ance. The differences that existed between these two measures were ascribed to the experimental treatment. Somewhat more sophisticated studies of this type have included the use of a control group that manifested the same sorts of pertinent characteristics as did the experimental children. Evaluations of both groups in terms of degree of change for any given variable then led to determination of the amount of the change that was related to the experimental treatment.

The second type of design was based on the assessment of a particular trait in a certain group of children. The group was divided on the basis of attendance or non-attendance in pre-school programs. The assumption was then made that any differential in the measurements could be assigned to the pre-school treatment.

The hypothesis has been made that the pre-school program, which has held as its objectives increasing the children's intellectual curiosity and adding to their fund of information, would produce an accelerated rate of mental growth. The issue has become a highly controversial one at times because it was a part of the larger question of nature versus nurture. The original studies were done while psychology was feeling the impact of Watson's behavioralism; the next set of studies were conducted during a period when the most common point of view was "I.Q. is a constant"; the more recent studies have been carried out in a period of revived environment-

alism (Hunt, 28 and Bloom, 6).

The Iowa Child Welfare Research Station produced the most extensive work in intellectual change as a part of a larger series of studies on the effect of a variety of environmental conditions upon mental development. These findings by Wellman (57, 59, 58), by Skeels, Updegraff, Wellman, and Williams (46), by Skeels (45), by Skodak (47), and by Stoddard and Wellman (48) generally reflected gains in I.Q. by children attending pre-schools. The interpretation placed upon these gains was that involvement in a pre-school program could bring about gains which would not have occurred otherwise and are maintained into later school attendance. Deutsch (16) stated that his work had led him to conclude that "children who have had a pre-school and kindergarten experience are more likely to cope appropriately with the kinds of things the school demands intellectually than are children who had not had this experience". He went on to say that preliminary data indicated the pre-school experience was associated with higher group intelligence scores, that these scores remain higher in the first grade, and that the differential remains even when socio-economic differences are controlled.

Gray and Klaus, working with twenty disadvantaged Negro children who had attended summer enrichment programs, reported on changes in intellectual functioning following nursery school experience. Control groups were

identified for both group T-1 (two summers of school and home contact in the intervening year) and group T-2 (one summer school program). Results of pre-and post-testing over a fifteen month period indicated significantly different gains on the Binet and the Peabody Picture Vocabulary Test for the experimental groups. Average changes for the groups were:

Group T-1 : +10.1 from 85.6 to 95.7
Control T-1: - 5.0 from 87.4 to 82.4

Group T-2 : + 5.1 from 91.2 to 96.3
Control T-2: - 2.5 from 88.0 to 85.5

A study in Jerusalem, Israel, attempted to measure the changes produced in kindergarten children by an enriched program. Three hundred six five-year-old children were assigned to four experimental and four control groups. The control groups were taught by the traditional method. At the end of the kindergarten year, the gains in I.Q.'s were significantly higher for the experimental groups. An average of six points on the Stanford-Binet and an average of ten points on the Wechsler Intelligence Scale for Children were reported in favor of the experimental group. All experimental children showed some gains, but those with the lower initial I.Q.'s showed the greatest gains over the year. (49)

Another study having bearing upon the measured intelligence of culturally deprived children was done by Haggard (24, pp. 141-186). Using a test which minimized middle-class bias, he found that low-status children, when

properly motivated, did significantly better than when motivation was not heightened. Following practice periods, both the upper-status and lower-status had made gains; however the gains made by the culturally deprived were greater. When the effects of all treatments were combined, there was no significant difference between the upper-amd lower-status groups in their ability to learn to solve intelligence test problems.

Wilkerson (61) reviewed pre-school programs in the Review of Educational Research. She reported on the Baltimore program begun in 1963. Its purpose was to determine "whether early admission to school can overcome any of the barriers to learning which environmental factors seem to impose". Sixty four-and five-year-old children were admitted to two centers located in two depressed-area schools. An extensive research design was initiated to assess the longitudinal effects of the projects. According to Wilkerson,

> "Measurements of growth among the 28 children who remained in each center during the first five months of the project revealed significant development. Mean differences between initial and post-test scores on the Columbia Mental Maturity Scale showed a 15-point gain in one center and a 9-point gain in the other. All of these mean differences were reported to be significant at the 0.001 level. No comparisons with control groups were reported."

The Ypsilanti, Michigan, study described by Weikart, Kamii, and Radin (56), was composed of three "Waves". The first, Wave 0 was composed of thirteen four-year-old children who spent 1962-1963 in nursery school, 1963-1964

in kindergarten, and 1964-1965 in first grade. Wave 1, ten three-year-olds, spent two years in nursery school and entered kindergarten in 1964-1965. Wave 2, thirteen three-year-olds, were in nursery school from 1963-1965. A control group had been identified for each Wave on the basis of a Stanford-Binet I.Q., a Cultural Deprivation Rating, and some associated factors. Use was made of the Stanford-Binet Intelligence Scale, the Arthur Adaptation of the Leiter International Performance Scale, and the Peabody Picture Vocabulary Test.

The findings for intellectual growth were:

1. At the end of the first year, Wave 0 was significantly higher on the Stanford-Binet than its control group at the 0.01 level; Wave 1 was higher at the 0.05 level; and Wave 2 was higher at the 0.001 level. The differences at the end of the second year were non-significant.

2. The scores yielded by the Leiter International Performance Scale indicated an unusual increase in the scores of Wave 2. This gain over the controls was significant at the 0.001 level.

3. Significant differences found on the Peabody Picture Vocabulary Test favored Wave 1 over its control group after two years of nursery school (0.01 level), and Wave 2 over its control group after one year (0.01 level).

These results were similar to those of Deutsch who

reported sizeable increases in I.Q. scores among pre-school children enrolled in the New York City program he had initiated.

These findings have not always been duplicated by other investigators in other settings. The most outstanding of these were published in the 1940 Yearbook of the National Society for the Study of Education. These studies were by L. D. Anderson (2), Bird (5), Olson and Hughes (40), Jones and Jorgensen(34), Lamson (35), and Goodenough and Maurer (22). In all cases their studies reported that attendance in pre-school programs was not associated with significant gains in I.Q.

Accounting for the divergencies in findings would not be a simple matter. As indicated by Swift, (50, p. 253-254):

"Attempts to account for such differences have included the following factors as possibly influencing the results: practice effects, bias of testers, coaching by parents or nursery school teachers, inadequate standardization of the tests used, inadequacies in statistical handling of the data, selective factors in the populations studies, and differences in parental characteristics. On the basis of the data available, it is probable that none of these is sufficient to have caused all the differences in results obtained--though in a specific study, one or more may have been operative. Important factors that should be more carefully considered are the specific nature and content of the program provided for the children, its relation to the changes expected, and its relation to the children's experiences outside the nursery. As generalizations about nursery school attendance, the results from these studies are inconclusive and contradictory. The possibility that certain nursery programs can contribute to increases in mental functioning, however, is not ruled out."

Visual-Motor Perception

Fewer studies have been completed concerning visual-motor perception than for the other measurable characteristics of culturally deprived children. This paucity has probably been prodmced by the unavailability of very many satisfactory instruments to measure status and change in perceptual growth. However, since the standardization of such tools as the Frostig Developmental Test of Visual Perception, heightened interest has been shown in this dimension, and a reasonable assumption would be that in the near future studies of perceptual adequacy will become more common.

This need for more research was reflected by Bloom (7). He commented that the work by Jensen (29), Hunt (27), Weaver (55) and Deutsch (15) was related to the importance of early visual discrimination experiences for children. Bloom concluded that the home and early environment of the culturally deprived child produced certain deficits in perceptual skills:

> "Beginning very early, the child comes to perceive many aspects of the world about him. This perceptual development takes place through the sensory modalities such as vision, hearing, touch, and even taste and smell. This development continues in more and more complex ways as the child approaches the beginning of formal schooling at age six. Perceptual development is stimulated by environments which are rich in the range of experiences available; which make use of games, toys, and many objects for manipulation; and in which there is frequent inter-action between the child and adults at meals, playtimes, and throughout the day. At the beginning of the first grade there are differences between culturally deprived and

> culturally advantaged children in the amount and variety of experiences they have had and in their perceptual development. Although differences in perceptual development are less evident by age nine, it is likely that the differences present at age six make for differences in school learning in the first few grades." (7, p. 13)

Boger reported on the results of a study designed to evaluate the effects of perceptual training on rural culturally deprived children in primary grades. Pre-test measures of the experimental and control children were made using the Otis Quick-Scoring Mental Ability Test and the California Test of Mental Maturity. During a five month training period practice was provided in following directions, noting details, perceiving spatial relationships, detecting likeness and difference in pictorial and geometric patterns, and developing increased co-ordination of eye and hand movements.

On the pre-test all of these groups of rural children were below average on the norms for the intelligence tests. Following the training period, all groups of experimental children showed significant increases on the post-test. A second post-test was given five months later; the results from it indicated that the gains had been maintained.

On the basis of these results, Boger suggested that training in visual perception could produce two types of change in rural pupils. "The extent of improvement as a result of training indicates (1) that scores from I.Q. tests often give an estimate of mental ability which is

an injustice to those pupils so far as actual ability is concerned, and (2) that perceptual training remedies some of the handicaps which influence performance of rural children on group I.Q. tests. It would appear that rural elementary school children are capable of responding to a more challenging school program than I.Q. scores derived from group intelligence tests frequently s em to justify." (8, p. 53)

Weaver, (55), working at the Early Training Project for the culturally deprived child, used the Illinois Test of Psycholinguistic Abilities to measure the sixty-one pre-schoolers and their controls. Prior to training he noted that both the experimental and control subjects were relatively higher in visual-motor patterns and relatively lower in auditory-vocal channels. Following the special treatment period, the experimental groups were significantly higher in a number of areas, among which were the two mentioned above, visual-motor and auditory-vocal.

Using kindergarten children, Covington (13) studied the effects of training on visual perceptual ability. Seventy-two children were divided into four groups, by social status and by treatment. On the pre-test the upper-status children scored significantly higher than the lower-status children. During the training period the experimental groups were shown pictures of a variety of abstract forms, whereas the control children were shown

ordinary pictures. In the post-test both upper-and lower-status experimental children showed gains in their scores. Moreover, the gains made by the lower-status children were significantly higher than the upper-status gains. The gains made by the upper-status group (comparing post-test and pre-test scores) were not significantly different; this suggested that the upper-status children had been functioning at near maximum before the training period. The unusually larger gains by the lower-status group were interpreted to mean that they had been more tractable to additional training. The upper-and lower-status experimental group scores were not significantly different following training. The conclusion was drawn that although the lower-status children were relatively deficient in their visual perceptual abilities before training, tney were quite responsive to training for the remediation of this deficit.

Morris and Morris (38), in a study of twenty-eight preschool children enrolled in an enrichment program, attempted to evaluate the status and trainability of visual-motor perception in culturally deprived children. Use of the Frostig Developmental Test of Visual Perception yielded evidence that these children as a group were retarded in visual-motor development. Of the twenty-eight, only three scored at or above their chronological age in perceptual age. When compared to their Stanford-Binet, L-M, mental age scores, three scored above their M.A.

score, three scored within plus or minus three months of their M.A. score, the remaining twenty-two scored six months or more less than their mental age score. A limited training program was begun in which the children were given ten minutes of practice with Frostig developmental materials every third day. There were five practice periods. Following a five day period of no practices, the Frostig test was administered as a post test. The average gain was computed, and one month was deducted to account for the lapse of time since the pre-test. The remaining average gain of four and one-third months was attributed to the training effects.

Deutsch summarized the information about the disadvantaged child and the learning process in which he considered the lack of readiness of the culturally disadvantaged child. One of the factors was the lack of stimulation in the home to visual, tactile, and auditory experiences. Deutsch indicated that there were few objects or experiences in the culturally deprived home to help develop visual discrimination. He then referred to data which indicated that class differences in perceptual abilities tended to decrease with age. (15, p. 163-180)

Summarization of these studies indicated that:

1) Culturally deprived children were perceptually deficit.

2) When given special training, culturally deprived children were able to benefit from this exper-

ience, i.e. to diminish the deficit.

Achievement

(The related literature for this section was interpreted to mean studies pertaining to preschool and primary age children in the area of language and form discrimination bearing on reading readiness.)

Data from most of the studies evaluating the status of language habits and skills have indicated that the culturally deprived children function with many verbal deficits when compared to the norms of the middle class school. Ausubel (4) concluded that delayed acquisition of formal language forms led to difficulty in transition from concrete to abstract modes of thought. A similar point of view was held by McCandless (37) who said the disadvantaged child tended to be more concrete and inflexible in his intellectual functioning than was the middle class child. Siller (44) studied the qualities of abstraction in children from higher and lower status classes. When higher-status children were matched with lower-status children on nonverbal scores, the higher status subjects were superior on verbal concepts. Deutsch (18) related these things to a study of tasks performed in the home. These tasks, which he felt stemmed from the undercurrent of their life-style, were related primarily to concrete objects and services. However, no evidence was given to indicate how these differed from

middle class tasks. Both Jensen (29) and John (33) noted deficiencies in the lower-class child's relatively poorer performance in auditory discrimination, in manipulation of language word forms, and in recognition of perceptual similarities. All of these have been found to be related to reading readiness. Previously a similar type of finding had been written up by John (33) and John and Goldstein (32) as a result of their intensive work on certain patterns of linguistic and cognitive behavior and social class level. The disadvantaged group, it was noted, had some limitations in their abilities to label, discriminate, categorize, and generalize.

Comparison of the speech of culturally deprived children in a Midwestern kindergarten was the subject of Thomas's study (51). He conducted a structured interview with each child in the sample and computed such measures as: length of verbal response, complexity of sentence structure, proportion of parts of speech, and types and frequency of grammatical errors. Thomas found that his subjects used significantly fewer words per remark than did a middle class group. The most important result relevant to reading readiness was the evidence that the subjects used only 50 to 80 percent of the words contained in five of the standard words lists considered appropriate for primary grades.

A study which also indicated a depressed vocabulary

among primary school disadvantaged children was conducted by Figurel (21). In a research project involving second grade children, an examination and comparison of the vocabularies of lower and middle class children led Figurel to report that the disadvantaged group had a vocabulary one-third the size of the middle class group vocabulary. He compared the vocabulary of the second grade disadvantaged child to that of the middle class preschooler: the ratio was 1:2. Many words considered common in school (sink, beef, honey, etc.) were learned one or two years later by the disadvantaged child. Figurel noted that some of the disadvantaged children had large vocabularies, but these were not the words needed for school success.

In keeping with the environmental emphasis of Hunt (27), evidence has been gathered which was supportive of the hypotheses that change could be produced in the characteristics of culturally deprived children. Brazziel and Terrell (10) conducted an experiment in the development of readiness in a disadvantaged group of twenty-six first graders. They reported that for six weeks the experimental group was in a special program to develop vocabulary, perception, word reasoning, and ability to follow directions. During these six weeks there were weekly conferences and meetings with the parents. At home the children watched thirty minute educational television programs. At the end of the special training period, the experimental group and the three control

groups were given the Metropolitan Readiness Test. The scores of the experimental group were comparable to the national norms, the average being at the fiftieth percentile. Scores for the control groups however, were significantly lower. Intelligence measures were taken on the experimental group at the end of seven months. The average score was 106.5 which was significantly higher than the assumed 90 for culturally deprived children.

Covington (13) performed an experiment in training visual perceptual ability in kindergarten children. Using a visual discrimination test in which children matched an abstract form to the same form in a cluster of three, she found that the upper-status children scored significantly higher than the lower-status children. During the training period, the control groups viewed pictures while the experimental groups viewed other abstract forms. All children were merely instructed to look at what was being projected before them. Both the upper-and lower-status experimental groups showed significant gains in their scores, whereas the controls showed little gain. The gains made by the lower-status experimental group were significantly higher than the gains made by the upper-status experimental group, suggesting that the lower-status group was more susceptible to training in this characteristic. The post-test scores of the experimental upper-and lower-status groups were not significantly different from each other.

Whipple (60) studied the possibility that socially adapted preprimer reading materials were more effective than traditional preprimers in producing reading readiness. Three preprimers were developed to meet multicultural conditions and to include the vocabulary and speech patterns which promote correct speech. A "classroom experiment" was conducted in which the performance of first-grade pupils using these readers was compared to that of first-grade pupils using the standard readers.

Using twelve classes whose total enrollment was two hundred fifty-two, Whipple assigned six groups to use the multicultural preprimers and six to use the standard preprimers. When the series of three texts were completed, the children were tested. The groups then exchanged texts. When they had finished the second series, they were evaluated again.

Some of the findings of the study were:

1. When word-recognition scores were compared for the multicultural and the standard preprimers, no significant difference was found. However the number of children receiving perfect word recognition scores on the multicultural preprimers was significantly higher (0.01 level) than on the standard preprimer.

2. Comparisons of mean number of errors in oral reading was significantly lower (0.05 level) for the boys using the multicultural preprimers. Highly significant differences (0.01) were found for Negro pupils in favor of the multicultural preprimers.

Because no attempts were made to account for differences within the groups other than ethnic origin, the

results of the Whipple study were interpreted by Wilkerson as worthy of "tentative interpretation", (61, p. 434).

In the study by Weikart, Kamii, and Radin (56) described previously, the Gates Reading Readiness Test was administered to Wave 0 and its control group in the spring of 1964 (after one year in nursery school and one year in kindergarten). On all five subtests, the experimental group scored higher. However, the differences were significant (0.05 level) on only two subtests: Picture Directions and Word-Card Matching.

Summarization of the studies on the status of the skills in language and perception related to reading readiness indicated that cultured deprived children rated consistantly lower than would a sample drawn from the normal population. It was also seen that when subjected to training periods, these children were able to make gains in these abilities, and these gains were usually appraised as significant.

Social Growth and Adjustment

Opportunity for growing and adjusting in peer relationships is one of the primary objectives of the preschool setting. This expectation has been the basis for many parents deciding to send a child to nursery school. It has been hypothesized that the opportunity to interact with other children in a controlled setting will produce

better social adjustment and increased acquisition of social skills.

Early studies in this area were of limited value as they consisted of repeated observations of the same children. In as much as the effects of maturation cannot be ruled out without the presence of either a matched control group or a standardized observation scale, the findings could be considered only as suggestive for future studies. Investigations included in this category were: Ezekial (20), Malloy (36), Andrus and Horowitz (3), Horowitz and Smith (26), Joel (31), and Vitz (53). Among the general conclusions were that preschool experiences led to a greater degree of socially outgoing behavior, that social skills were more satisfactorily used, and that greater maturity and independence emerged.

A second set of research studies have been carried out in which preschool attenders have been compared to preschool non-attenders. These have been conducted by Walsh (54), Cushing (14), Hattwick (25), Jersild and Fite (30), Van Alstyne and Hattwick (52), and Brown and Hunt (11). Most of these used teacher's ratings of the several dimensions of social behavior in their attempts to assess social adjustment. Direct observations were collected by Jersild and Fite to produce their data. Still other studies have tried to identify the effects of preschool training on social growth and adjustment in elementary grades. Among these were Allen and Masling (1)

and Bonney and Nicholson (9), who used sociometric techniques to assess popularity along with teachers' ratings.

Although a number of the above studies have reported findings supportive of the hypothesis of better social adjustment following preschool experience (Walsh, Cushing, Hattwick, and Allen and Hasling), others have not (Bonney and Nicholson, Brown and Hunt, and Andrus and Horowitz). In their series of three studies, Bonney and Nicholson concluded that the data collected from the four groups did not lend support to the idea that attendance at a preschool would be associated with better personal-social adjustments over a period of several years. Negative support to the hypothesis was produced by the Brown and Hunt study of kindergarten adjustment. Their findings indicated, "Non-nursery children were perceived by their teacher to be better adjusted than nursery school children in personal adjustment, relations with other children, and participation in group activities." (11, p. 595)

Possible factors producing the variance in the findings were: different indices of adjustment used by the investigators; differences in the raters' abilities to be objective and valid; differences in the school environment encountered after preschool; and factors operative in the initial decision to have the child attend preschool.

Several precautions must be observed before the

results of these studies could be applied to culturally deprived children:

(1) These studies were usually done with middle and upper class children whose parents chose to use preschool experience and to pay for these services.

(2) These studies did not specify the type of preschool activities which were effecting these changes, and they did not elaborate upon the type of school experience which followed. It was also pointed out that should certain relationships exist between the preschool objectives and activities and those for the school, that negative transfer could have occurred.

CHAPTER III

THE DATA

The purposes of this study have been to determine whether significantly different increments or differences were observed for the children who participated in Project Head Start during the summer of 1965, and their non-Head Start controls in the areas of intellectual ability, visual-motor perception, achievement, and social growth and adjustment in the course of their kindergarten experience. In addition to the data relating the Head Start children to their controls, information was also gathered to relate these groups to the total kindergarten population in achievement and visual-motor perception. A secondary purpose of this study was to gather data relevant to the quality of responses which culturally disadvantaged children make to visual stimuli of variable fidelity. For those children who did not enter kindergarten a case study approach was utilized as the number in the group became extremely small before the experimental period was completed.

Objectives:

A.) The central objective of this research was to investigate whether enrollment of four and five year old children in the Head Start preschool enrichment program in Kearney, Nebraska, resulted in significant differences and increments in measured intellectual functioning,

visual-motor perception, achievement, and social growth and adjustment.

This objective was tested through the following null hypotheses:

1) There will be no significantly different increments evidenced by each Head Start child when compared to his selected non-Head Start control child in Kearney, Nebraska, a) in intellectual functioning, b) in visual-motor perception, c) in achievement, and d) in social growth and adjustment.

   a) There will be no significantly different increment in measured general intellectual ability between each Head Start child and the selected non-Head Start control child.

   b) There will be no significantly different increment in the measured visual-motor perception between each Head Start child and his selected non-Head Start control child.

   c) There will be no significantly different increment in the measured level of achievement between each Head Start child and his selected non-Head Start control child.

   d) There will be no significantly different increment in the measured level of social growth and adjustment between each Head Start child and the selected non-Head Start control child.

2) There will be no significant difference in the mean increments between the two groups, Head Start children and non-Head Start children, in a) intellectual ability, b) visual-motor perception, c) achievement, and d) social growth and adjustment.

B) The secondary objective of this research was to investigate whether the Head Start children and their controls constituted different populations than did the

balance of the public school kindergarteners regarding their visual-motor perception and achievement.

The following null hypotheses were tested in order to accomplish this objective:

1) There will be no significant difference in the measured visual-motor perception between the group composed of Head Start children plus their controls and the balance of the kindergarten class for
   a) the Fall testing
   b) the Spring testing

2) There will be no significant difference in the measured achievement between the group composed of Head Start children plus their controls and the balance of the kindergarten population for
   a) the Fall testing
   b) the Spring testing

3) There will be no significant difference in the measured visual-motor perception among the Head Start children, the control group, and the balance of the kindergarten population for
   a) the Fall testing,
   b) the Spring testing

4) There will be no significant difference in the measured achievement among the Head Start children, the control group and balance of the kindergarten population for
   a) the Fall testing
   b) the Spring testing

C) The additional objective of this research was to investigate whether disadvantaged children were able to respond to low fidelity visual stimulus items with the same effectiveness that they responded to similar stimuli of high fidelity.

The following null hypotheses were tested in order to accomplish this objective:

1) There will be no signifi ant difference between scores earned by the Head Start

children on the low fidelity stimulus tasks and the high fidelity stimulus tasks.

2) There will be no significant difference between scores earned by the non-Head Start control children on the low fidelity stimulus tasks and the high fidelity stimulus tasks.

3) There will be no significant difference in the responses to low fidelity stimulus tasks between the Head Start children and the non-Head Start control children.

4) There will be no significant difference in the responses to high fidelity stimulus tasks between the Head Start children and the non-Head Start control children.

Procedures

The objective of determining whether Head Start children and matched non-Head Start children would show different increments in measured intellectual functioning, visual-motor perception, achievement, and social growth and adjustment during their kindergarten year was by nature, experimental. The same was true for the objective developed through the hypotheses related to visual stimulus fidelity.

A) General Design

The independent variable for both objectives in this study was participation in the Kearney, Nebraska Head Start project during the summer of 1965. The dependent variables were 1) the amounts of growth evidenced by the Head Start children in intellectual functioning, visual-motor perception, achievement, and social growth and adjustment, and 2) the differences between performances on the high and low fidelity visual stimulus tasks.

B) Population and Sample

The twenty-four four-and five-year-old children enrolled in Project Head Start class in Kearney, Nebraska, during the summer of 1965 were the experimental group of subjects. A matching group of children not enrolled in Head Start or other preschool enrichment programs were selected to serve as a control group. Each Head Start child beginning kindergarten was matched with a non-Head Start child upon the basis of age (plus or minus three months), sex, language spoken in the home, intelligence level, (below average, average, above average and/or ± 5 I.Q. points), and occupational level of the guardian or parent as defined by the Warner, Meeker, and Eels Occupational Rating Scale.

C) Data, Instrumentation, and Analysis

1) Data for the first four hypotheses was derived from the use of four different instruments.

a) The intellectual functioning of the subjects and their controls was measured by means of the Stanford-Binet Intelligence Scale, Form L-M. The increment in intellectual ability of each Head Start subject was compared to the increment of the selected non-Head Start control subject for the period of the school year 1965-66. The appropriate statistical procedure used to test the significance of the incremental differences was the Wilcoxon Matched-Pairs Signed-Ranks test.

b) To identify the increments in visual-motor perception, the Frostig Development Test of Visual Perception was used. The perceptual gain of each Head Start child was compared to that of his selected non-Head Start control and the significance of the differences in these gains was analyzed by the Wilcoxon Matched-Pairs Signed-Ranks Test.

c) The test of achievement used was the Metropolitan Readiness Test, Form R. Gains in raw scores for each of the subtests were statistically analyzed for each Head Start child and his selected non-Head Start control. The significance of the differences was derived using the Wilcoxon Test.

The supplementary test in the Metropolitan Readiness Test was the Drawing-a-Man Test. This test was given and scored according to the descriptive categories suggested in the manual. The nature of the changes in category ranking for each Head Start child and his selected non-Head Start control was analyzed by use of the Wilcoxon Matched-Pairs Signed-Ranks Test.

d) The Kearney Pupil Progress Report was the measure proposed to evaluate the social growth and adjustment of the experimental and control subjects. The nature of the changes evidenced between the fall and spring measure for each Head Start child and his selected non-Head Start control was tested by the Wilcoxon Matched-Pairs Signed-Ranks Test.

The hypotheses appearing under Objectives: A2, a-d utilized the increments shown by the groups, Head Start and non-Head Start. The correlated t-test was used to evaluate the significance of the differences in the means and variances of the gains in the two groups.

The instruments for the hypotheses stated in the Objectives: B were those specified previously for hypotheses 1, b and c, the Frostig Developmental Test of Visual Perception and the Metropolitan Readiness Test, Form R. The significances of the difference between and among the groups were evaluated by analysis of variance, with the appropriate correction for different sized groups.

2) The instrumentation of the objective related to responses to high and low fidelity visual stimuli was as follows:

The Hiskey-Nebraska Test of Learning Aptitude, revised and restandardized in 1965, is composed of items which are presented without speech being required of the subject or the examiner. Because the Hiskey-Nebraska has been designed for the child without hearing or speech, visual

stimuli are relied upon. Four subtests were selected from the Hiskey-Nebraska:

a) picture identification
b) block patterns
c) picture associations
d) visual attention span

Each of these is presented to the child in the form of black and white line drawings. For the purposes of this experiment, these Hiskey-Nebraska subtests was defined as the low fidelity visual stimulus task.

The high fidelity visual stimulus task used was the Morris adaptation of the Hiskey-Nebraska subtests. Each drawing that appears in the Hiskey-Nebraska subtests has been produced as a full color 35 m/m transparency of the real object. For example, where a black and white line drawing of an alligator appeared on the Hiskey-Nebraska, a full color 35 m/m transparency of a live alligator appeared on the Morris adaptation.

Use of the t-test was proposed to evaluate the significance of the differences of the scores earned by the experimental and control groups for each stimulus fidelity condition. To evaluate each child's performance on the two stimulus fidelity conditions, the Wilcoxon Matched-Pairs Signed-Ranks Test was used. In order to control possible practice effects between the Hiskey-Nebraska and the Morris adaptation of the Hiskey-Nebraska, two precautions were observed:

a) a table of random numbers was consulted to determine which test would be administered first for each pair of subjects
b) a controlled period of time was allowed to elapse between administration of the two tests.

All examinations were given by certified psychometrists except the Metropolitan Readiness Test and the Kearney Pupil Progress Report. These two instruments were designed

for use by a classroom teacher. Accordingly, the teachers and the psychometrist cooperated on these evaluations.

The initial Stanford-Binet scores for the Head Start children were ascertained in June in the first days of the Head Start program. The assumption was made that these scores could be prorated on a mental age basis to September, the rationale being that without the special experimental effect of the Head Start program, the intellectual growth of this group would not have reasonably varied from the intellectual growth of the control children.

CHAPTER IV

FINDINGS OF THE INVESTIGATION

To facilitate the presentation of the results of the thirty-some analyses of the characteristics of the Head Start children, the control children, and the balance of the kindergarten population, the hypotheses have been rearranged so that discussion of them parallels the review of the related literature. The discussion of the tests of change and difference in intelligence appear first, followed by review of the results of the tests related to the changes in visual-motor perception, in which, as in the case of reading readiness, all kindergarten children participated. The third section reports the results of tests of reading readiness given both fall and spring. Discussion of the status and changes in social growth and adjustment comprises the fourth section. The final discussions incorporate the results of the measures of the effects of variable fidelity in visual stimuli. The tables summarizing the data given in these sections appear at the end of this chapter.

The latter part of this chapter is a series of brief case studies of the six children who were too young to enter kindergarten in the fall following their Head Start summer experience.

Status and Change in Intelligence

At the beginning of the summer 1965 program all

Head Start children were given the Stanford-Binet, L-M. The I.Q. scores earned ranged from 55 to 115 with a mean of 89.3. When the Stanford-Binet, L-M, was given at the end of the kindergarten year, the I.Q. scores ranged from 69 to 117 with a mean of 99.2, the increment being 9.9. Examination of the differences in individual scores revealed that the greatest increments occurred more frequently for the children whose initial scores were below the standardized mean. For those children whose initial score was at or above the national mean, the subsequent increments were within the standard error of the mean.

The control children were identified as indicated in Chapter III, either as being in the same intelligence level (average, above average or below average) and/or within plus or minus 5 I.Q. points. The range for the initial Stanford-Binet, L-M, scores was from 55 to 115 with a mean of 89.8. The scores earned by the controls at the end of the kindergarten year ranged from 67 to 120 with a mean of 97.7, an increment of 7.9. No observation could be made about which children changed most on the basis of visual inspection of scores. It was noted however that fewer control children than Head Start children made gains greater than ten points. The only loss in I.Q. score, a minus six points, occurred for one of the control children.

The significance of the difference in gains between the two groups was tested first by use of a correlated

t computation. The results of the analysis indicated that the null hypothesis of no significant difference in gains in mental age scores between the two groups was to be rejected at the 0.05 level. The gains made by the Head Start children exceeded those of the control children. To test the significance of the gain in mental age of each Head Start child with that of his control child, the Wilcoxon Matched-Pairs Signed-Ranks test was used. In this analysis, the null hypothesis was rejected at the 0.02 level of significance on a two-tailed test, once more indicating greater gains on the part of the Head Start children.

At this point evaluation of the significance of change for each group was indicated. Using the correlated t-test, it was found that the spring scores of the control group were significantly higher than the fall scores. The t of 4.406 with seventeen degrees of freedom was significant beyond the 0.001 level. A similar computation for the Head Start children yielded a t of 5.421. At seventeen degrees of freedom, the t was significant beyond the 0.001 level. Once more, the greater t indicated that the larger gains occurred for the Head Start children. Therefore, it was concluded that these fall and spring scores did indeed represent different populations with respect to performance on the Stanford-Binet, L-M, for the two groups.

Status and Change in Visual-Motor Perception

To test the significance of the gains in scores earned by each Head Start child and his control, the Wilcoxon Matched-Pairs Signed-Ranks technique was used. The analysis was done on the raw score data from the subtest, Eye-Motor Coordination, of the Frostig Developmental Test of Visual Perception. The T that was computed exceeded the table value for significance, and accordingly, the null hypothesis was not rejected. The correlated t-test was used to evaluate the changes made by the two groups, Head Start and Control. It was found that the means were so similar that the t became less than unity. Therefore the null hypothesis of no significant difference was not rejected.

The data for the fall testing was also analyzed by analysis of variance. Grouping the Head Start children and their controls together and comparing them to the balance of the kindergarten children produced an F of 10.82 which was highly significant. The null hypothesis was thus rejected. When the Head Start children, the controls, and the rest of the kindergarten were considered separately, the F became 5.91, still highly significant. The mean fall scores in visual-motor coordination were: Head Start, 9.6; controls, 8.6; others, 11.0.

In the spring similar computations were performed. The F determined when the Head Start children and their controls were considered as one group was 15.36. This

highly significant value led to the rejection of the null hypothesis. When each group was considered separately, the F was 7.73, a highly significant value; consequently the null hypothesis was again rejected. The mean spring scores by groups were: Head Start, 11.1; Controls, 10.9; others, 13.3. From the fall and spring means scores the mean gains were figured: Head Start, 1.5; Controls, 2.3; others, 2.3.

Status and Changes in Achievement of Reading Readiness

As indicated in Chapter III, the measure of change in readiness for reading was the Metropolitan Readiness Test, Form R. These tests were given in the fall before readiness instruction was begun, and again in the spring near the end of the last month of school. All four subtests related to reading were administered. These were: Word Meaning, Sentences, Information, and Matching. (Word meaning is a picture vocabulary test in which the children are asked to mark a given picture. In the next subtest a sentence is read and the children mark the picture related to it. Information is the third subtest; here the children are to mark the picture about which a certain statement was true. In the last subtest, Matching, the children mark one of four figures which is identical to the example.) A test total score was also computed. The results of testing the hypotheses have

been organized by this subtest order.

Word Meaning:

Analysis of each Head Start child's gains compared to the gains made by his control was accomplished by use of the Wilcoxon Matched-Pairs Signed-Ranks test. Because four pairs of scores did not differ in their gains, the computed T of 22 for fourteen pairs was not significant, and the null hypothesis was not rejected. When the two groups were compared by a correlated t-test, it was found that the t of 1.90 at seventeen degrees of freedom was significant at the 0.10 level with the higher gains occurring in the Head Start scores. The null hypothesis was not rejected.

Comparison of the Word Meaning scores for the Head Start children, the controls, and the balance of the kindergarten children was accomplished by analysis of variance. In the fall, the F test of the scores of the group made up of Head Start children plus their controls compared to the balance of the kindergarten was highly significant, (F=27.80). When the three groups were considered separately the F was still highly significant, F=14.08. The average word meaning scores were: Head Starters, 13.8; Controls, 14.2; others, 15.9.

Spring scores were similarly analyzed. The F was highly significant whether the Head Start children were considered separately or with their controls. Average scores for the spring measure on word meaning were:

Head Starters, 15.8; Controls, 14.4; others, 16.9. Gains for the year by group in word meaning were: Head Starters, 2.0; controls, 0.2; others, 1.0.

Sentences:

Each Head Start child's sentences score gain was compared the gain of his control by use of the Wilcoxon Matched-Pairs Signed-Ranks test. Although the matched pairs were of less weight in favor of the Head Start children, the T of 51.5 with N=14, was not significant, and the null hypothesis was not rejected.

Testing the significance of the mean increments of the groups, Head Start and control, was done through the use of the correlated t-test. The difference between the mean gains was so small that t was not significant, and the null hypothesis was therefore not rejected.

Comparison of the fall Sentence scores for the Head Start children plus their controls and the balance of the kindergarten yielded a highly significant F of 25.32. When the three groups were considered separately, the F of 12.90 was still highly significant. Mean fall scores for Sentences were: Head Start, 7.9; control, 7.4; others, 9.7.

Similar analysis of the spring Sentence scores yielded a highly significant F of 18.62 when the Head Start children were grouped with the controls, and a highly significant F of 9.73 with each group appearing separately. Mean spring Sentences scores were: Head Start, 10.0;

controls, 9.4; others, 11.1. Mean gains for the year in Sentences were: Head Start, 2.1; control, 2.0; others, 1.4.

Information:

The gain of each Head Start child was compared to the gain of his control on the Information subtest. The test of significance used was the Wilcoxon Matched-Pairs Signed-Ranks. Although there was a slight tendency for the scores in favor of the Head Start children, the differences were not significant, and the null hypothesis was not rejected. Next the group gains were compared by use of the correlated t-test. The slight superiority of the Head Start children was in evidence, but the t of 1.08 was not sufficient to reject the null hypothesis.

The null hypothesis of no significant difference in the fall Information scores for the combined group of Head Start plus control children and the balance of the kindergarten was rejected when F was computed at 23.54, a highly significant level. When the three groups were analyzed separately, an F of 11.75 was produced, indicating that highly significant differences did exist in the fall measure. For the three groups, the mean scores were as follows: Head Start, 10.4; controls, 10.3; others, 12.4.

Parallel computations were made using the spring data. The F test produced from grouping the Head Starters and their controls and comparing them to the balance of the kindergarten was 52.81. The null hypothesis was therefore

rejected on the basis of this highly significant F. A similar conclusion was reached when the three groups were considered separately and a highly significant F, 28.00, was found. Information mean scores for the spring measures of the three groups were: Head Start, 11.9; controls, 11.1; others, 13.3. From this the mean gains were computed: Head Start, 1.5; controls, 0.8; others, 0.9.

Matching:

Gains in Matching for the two groups of individuals, Head Start and control, were analyzed by the Wilcoxon Matched-Pairs Signed-Ranks test. Although this weighting indicated a slight advantage for the Head Start children, the T test revealed no significant differences, and accordingly the null hypothesis was not rejected. When the group gains were investigated by use of the correlated t-test, it was found that the differences between the means was so small that the t value became insignificant. The null hypothesis was therefore not rejected.

Analysis of variance was the method used to evaluate the significance of the fall matching scores. The Head Start children and the controls were grouped together and compared to the rest of the kindergarteners. The null hypothesis of no differences in scores was rejected when an F of 49.90 was computed and appraised as highly significant. Considering the Head Start children and

the control children as separate groups and comparing them to the other kindergarteners yielded on F test of 24.88. This too was highly significant and led to the rejection of the null hypothesis once more. Mean fall scores for the Matching subtest were: Head Start, 7.0; controls, 6.8; others, 12.5.

In the spring when this subtest was readministered, the scores of the group, Head Start plus control children, was again compared to the scores of the other children. The null hypothesis of no significant difference was rejected at the highly significant level when an F of 15.48 was computed. On the basis of separating the Head Start children, their controls, and the rest of the kindergarteners, another test of no significant difference in scores was made. The F determined was 8.00 which exceeded the tabled highly significant F value of 4.71. The null hypothesis of no significant difference was therefore rejected at the 0.01 level of confidence. The mean Matching scores for the spring measures were: Head Start, 14.0; control, 13.2; others, 16.0. The mean increments were indicated as: Head Start, 7.0; controls, 6.4; others, 3.5.

Totals:

Use of the Wilcoxon Matched-Pairs Signed-Ranks test was made to analyze the gains of the individual pairs of Head Start and control subjects. The null hypothesis of no significant difference was rejected at the 0.02 level

on a two-tailed test; it was concluded that significant differences did exist in favor of the Head Start group. Comparison of the group gains was accomplished through the correlated t-test. The hypothesis of no significant differences in gains was rejected at a highly significant level. The larger mean value belonged to the Head Start group.

The fall total scores of the Head Start children, grouped together, were compared to the scores of the rest of the kindergarteners by analysis of variance. The hypothesis of no significant difference was rejected at the 0.01 level when an F of 48.17 was computed. When the Head Start children were in a separate group from the control children, and the analysis of variance computed for three groups, F was determined as 24.01. Because this exceeded the highly significant value of F at 2 and 293 degrees of freedom, the null hypothesis was rejected once more. The mean fall Total scores were: Head Start, 39.1; controls, 38.8; others, 50.5.

When the measures were repeated in the spring, similar analyses were performed. The F value found when the Head Start and control children were grouped together and compared to the balance of the kindergarteners was 38.50, and accordingly this highly significant F led to the rejection of the null hypothesis. Grouping the Head Starters and the controls separately and comparing them to all of other kindergarteners produced an F of 20.53.

On the basis of this, the hypothesis of no significant difference in scores was rejected at the 0.01 level.

The mean spring total scores were computed for the three groups: Head Start, 51.7; controls, 48.2, others, 57.4. The mean increments for the year by group were: Head Start, 12.6; control, 9.4; others, 6.9.

Drawing a Man:

The Drawing a Man subtest to the Metropolitan Readiness Test was administered both in the fall and spring. At the time the fall drawings were scored, it was noted that the Head Start children and their controls received quite similar evaluations. In many cases the pictures received the same rating, and about an equal number received poorer ratings as better ratings. The Wilcoxon Matched-Pairs Signed-Ranks test was used to evaluate the significance of the gains in drawing ratings. Seven of the pairs made identical amounts of change. Analysis of the differences of the remaining eleven scores yielded a T of 25. This was not significant. The hypothesis of no significant difference in gains was therefore not rejected with the observation that the higher ratings were found among the control group.

Social Growth and Adjustment

On the basis of the ratings given the children by the teachers on the Kearney Public School Pupil Progress Report in the fall and in the spring, gains in social

development were computed. When the gain of each Head Start child was compared to the gain of his control by the Wilcoxon Matched-Pairs Signed-Ranks test, the differences were found to be non-significant. Similarly, a correlated t-test of the group data yielded a non-significant test.

At this point it seemed reasonable to ask if these children actually constituted a different population in social development at the end of the year. A correlated t-test was done to identify how much change had occurred over the school year. The findings indicated that the changes in ratings for the control children were significant at the 0.05 level. The changes occurring in the Head Start group were significant at the 0.02 level. Therefore it was concluded that although both groups of children made significant changes during the year, the Head Start children made slightly more progress.

Effects of Variable Fidelity in Visual Stimuli

The last four analyses were concerned with the nature of effects on responses produced by changing from black and white line drawings to full color photographs of objects. The question was: Did preschool experience affect the ability of children to respond to lower or higher fidelity stimuli? The test used has been described in Chapter III. The four subjects used were:

Picture Identification - matching one picture to an identical one in a set of four.

Block Patterns - constructing block designs from simple towers to complex solids.
Picture Association - selecting the picture from a set of four which "goes best" with a given pair.
Visual Attention Span - short span memory items in which pictures shown, and then covered, must be selected from another set.

The first comparison was made of the responses of the Head Start children and the control children to the low fidelity stimulus tasks. In all subtests the results of the correlated t-test were non-significant. The null hypotheses were therefore not rejected. When the responses to the high fidelity tasks were investigated, the same relationships were found to exist and, accordingly, for all four subtests, the null hypothesis was not rejected.

The question was also raised whether the children in each group would respond the same to the high visual fidelity tasks as to the low visual fidelity tasks. For the Head Start children it was determined by use of the correlated t-test that no significant differences were found in Picture Identification, Block Patterns, or Visual Attention Span. However, on the subtest, Picture Association, the correlated t value was 2.80 which was significant at the 0.02 level. Therefore the null hypothesis was rejected, and the significant difference which existed was associated with better scores occurring on the low fidelity items (black and white line drawings.) When similar procedures were followed for the control

children, the same level of significance was found for low fidelity task items on Picture Association. On the subtest, Block Patterns, the high fidelity tasks were scored higher. The level of significance was at the 0.10 level and the hull hypothesis was therefore not rejected.

The conclusion from the four sets of correlated t-tests was that only in the subtest, Picture Association, did the Head Start and control children show a difference in their responses to high and low fidelity visual stimuli; the higher scores favored the low fidelity tasks.

Case Studies of the Four-Year-Old Children

The six brief case studies of the children appearing in this section were collected and written when it became apparent that this group would be too variable and too small to study by an experimental technique. All of the children attended the 1965 summer Project Head Start and were evaluated then. They were visited in their homes three or four times during the winter following. During these visits the Hiskey-Nebraska Test of Learning Aptitude, the Morris adaptation, the Stanford-Binet, L-M, and the Frostig Developmental Test of Visual Perception were given.

Five of these children were enrolled in the 1966 summer Project Head Start. During the last week the Binets and the Frostigs were given once more. Although there was some possibility of practice effects contributing to the last Binet score, it was assumed that since more than two months had elapsed since the previous measure, the effects would be minimal.

Boy C was just four years old when the first Project Head Start began in 1965. He was an outgoing child who was not afraid at all of his new situation. C was the third child in a family of four. Although their home was not large, it did have three bedrooms. There was evidence of consistent work by the parents to improve the appearance and convenience of the rooms. Each time the home was visited there was painting or sanding going on.

Some of this work was done by the mother, but the heavier aspects were the father's efforts.

In the Head Start setting, C was quite self-assertive. His voice loudly proclaimed what he was doing, what others should do, and what belonged to him. Moreover it was not easy to get him to play more quietly or share toys more readily. When this was discussed with the mother she admitted that she was not able to handle him, and that she had to rely on the father for discipline. In response to the question, "What do mothers do?" C replied, "Say, 'settle-down'. Mama, I don't like you."

The psychologist enjoyed a good relationship with C. He responded to her jovial acceptance of his loud, aggressive ways. In each interview with him during the period covered by the study, he was found to be alert, intent, and eager to work. The Stanford-Binet was given early in the summer of 1965. The results of that testing were as follows:

The basal age was established at Year 3-6. At Year 4, C missed naming objects from memory and pictorial identification. Credit was earned at Year 4-6 for aesthetic comparison and three commissions. C was able to assemble the rectangles and give definitions thereby earning two months credit at Year 5. Year 6 was the ceiling. The total mental age was 4-2. C was 4-1 at the time, and his deviation I.Q. was therefore 101.

The second Binet was given in the spring of 1966 at

C's home. Their home was a "busy" place, but the mother slowed everything down enough that C was able to concentrate well on the test. Because the picture vocabulary was missed at Year 4, the basal was established at Year 3-6 again. Opposite analogies were the only incorrect item at Year 4-6. At Year 5 pictorial similarities and differences were missed as was the assembling of rectangles. Successes at Year 6 were differences between two things and the maze drawing. There were no successes at Year 7. At this testing the mental age was 4-11, the same as the chronological age. Accordingly the deviation I.Q. was 100.

The last Binet was given at the end of Project Head Start 1966. This time the basal age was 4-6. Definitions, copying a square, and pictorial similarities and differences were correct at Year 5. At Year 6, differences and maze drawings were scored upon. The picture absurdities were detected at Year 7; no credit was earned at Year 8.

Each time the Binet was given the Frostig Developmental Test of Visual Perception was also administered. The scores were: summer 1965, 3-0; spring 1966, 4-0; summer 1966, 4-3. All of these scores were earned during periods of no training in perceptual skills.

In addition to the comments made earlier about C's social development, it was noted that he did not complete the last weeks of the 1965 program. C decided he simply

wasn't going any more. Nothing the mother could do (threats, bribes) would persuade him to do otherwise. By the summer of 1966, C was still his former self except that he was a little quieter and a much better listener. In the classroom he got along far more smoothly. C was more purposeful in his approach to toys, and more sociable with his peers and the staff. If he were asked to play less roughly or to ride the wagon slower, he was likely to comply.

During the winter the Hiskey-Nebraska and the adapted Morris version were given. These scores were compared to each other and to the summer Hiskey-Nebraska scores. The scores from the previous summer had indicated that C was developing at a normal rate. By winter consistent small gains had been made on both versions such that the scoring once more indicated normal development.

Summarizing the information about C would tend to suggest that he was developing normally intellectually and had lost no progress during the year away from Project Head Start. Perceptually he was somewhat retarded in his visual motor development, but the psychologist felt that the stimulation of kindergarten would probably accelerate his progress here. Socially C was quite normal in his relationships with the other boys and girls and the staff. Evidence indicated that he would have minimum difficulty adjusting to public school.

Girl R. was just four years old when the first Project Head Start began in the summer of 1965. She came from a Spanish family of fourteen children, mother, and father. The language in the home was usually Spanish although some English was also spoken. Living conditions were somewhat cramped as the family occupied a five room house.

R. was a hostile child who was quite suspicious of the staff members. When physically near them she would stare coldly from the sides of her eyes. She seemed to feel her world was quite a restrictive place, that adults were likely to cause trouble or discomfort: doctors and nurses give shots, policemen put people in jail, mothers and fathers "hit 'em", and soldiers "shoot in stomach". She was mildly indifferent to her peers.

The Stanford-Binet was given to R. early in Head Start. The results were as follows:

The basal age was established at Year 3 when the responses to pictures were missed at 3-6. At Year 4-0, she earned credit for naming objects from memory, pictorial identifications, and discrimination of forms. Aesthetic comparison was scored correctly at Year 4-6, and definitions at Year 5. No credit was earned at Year 6. The total mental age was 3-10; the chronological age was 4-3. The resulting I.Q. was 89.

R. was also given the Binet in late winter. She was much friendlier this time, perhaps because the testing was at her house. She spoke more freely and seemed

less suspicious of the psychologist. The basal age was 3-6. At Year 4 she missed opposite analogies and comprehension. Credit was received at Year 4-6 for pictorial similarities and differences. Three months credit was earned at Year 5 for picture completion, folding a triangle, and definitions. No credit was received at Year 6. The resulting mental age of 4-1 at her chronological age of 5-1 produced a deviation I.Q. of 78.

The final Binet was given at the end of the 1966 Project Head Start. R. had become quite friendly to her peers and the staff by then. She followed the psychologist around in hopes of "looking at more pictures" or making clay cookies. She was pleased when it was her turn to go with the psychologist. Year 4 was the basal age at this testing. Materials and comprehension were missed at Year 4-6. At Year 5, R. earned credit for completing the man, folding the triangle, and giving definitions. No credit was earned at Year 6. R. was 5-4 at this time and earned a mental age of 4-7. The resulting I.Q. was 84.

The Frostig Developmental Test of Visual Perception had also been given at the time of each Binet. The summer 1965, spring 1966, and summer 1966 test scores were, respectively, 3-6, 3-3, and 4-3.

The Hiskey-Nebraska Test of Learning Aptitude was given in the summer of 1965 and again during the winter. These scores were compared to the Morris adaptation of the

Hiskey-Nebraska. It was noted that R. had not made any noteworthy gains from summer to winter. On two of the subtests the score actually decreased. (The 1965 summer scores had indicated that R. was in the average range of intellectual development.)

Reviewing the information about R. suggested the following interpretations:

Socially R. has made quite satisfactory progress from one year ago. At that time she had not been very interested in her peers and was noticeably suspicious of the staff. By the end of the summer of 1966 she had learned to play with her peers and to be quite friendly to the staff. Increased skills in English have made her more conversant with her friends.

Intellectually, R. may not be developing satisfactorily. Initially she was below average on the Binet but not on the Hiskey-Nebraska. This, plus an inspection of her Binet failures, would tend to indicate that bilingualism was interfering with part of her potential. During the winter she showed a definite drop in her scoring, earning a 78 which was definitely a lower I.Q. than would have been predicted. However there was also some lowering in the Hiskey-Nebraska scores. When the summer Binet was given R. had regained at least part of her loss and earned an 84, a score not appreciably different from the first one earned. The psychologist who had visited the home four times during the winter felt this depressed

scoring might be related to the non-stimulating environment which existed there.

R's visual-motor scores showed some retardation. It was recommended that she be given a program aimed at developing perception. Perhaps this need will be met in kindergarten. The psychologist indicated that R. was bright enough to benefit from this kind of experience.

Girl E. came from a family of Spanish extraction. Her father was a laborer. The family unit was composed of the father and mother and their eleven children. There was one other child, a girl, who was married and living away from the home. The home itself was a large old house located on a spacious lot. The house was not in a good state of repair and its appearance was not enhanced by the presence of one bed in every room except the kitchen. The mother wished her children to "speak American", but part of the conversation did go on in Spanish. For Girl E. this meant limited skill with English. When she first entered Project Head Start in the summer of 1965, she cried for days and would not respond to consolation or mothering. Finally she began to be merely subdued, following along with the activities of the others without actually joining in. When she was asked to do something she would shake her head "no". If the request was repeated she would sit quietly and soon large tears would course down her cheeks. The psychologist interpreted

her actions to mean that E. was so concerned about whether she could do the task or not that she was unwilling to risk failure. This response was particularly related to speaking, as E. was willing to take the non-verbal and the visual-motor tests, but not the Stanford-Binet.

Accordingly, no Stanford-Binet was given the first summer in Project Head Start. The results below were for the late spring, 1966, Stanford-Binet testing:

E. was started at Year 4 where she responded correctly to objects from memory and discrimination of forms. (These two items required relatively little speech compared to the other four which were missed.) At Year 3-6, E. missed response to pictures and comprehension, while scoring on the other four which required less speech. Full credit was earned at Year 3 for a basal age. There was only one verbal item on that level, picture vocabulary, and only ten pictures had to be identified. Aesthetic comparison, pictorial similarities and differences, and three commissions were done correctly at Year 4-6. E. also earned credit for a speech item, comprehension, by responding for "eyes", "see the clock." At Year 5, E. scored on folding the triangle, copying the square, and putting the rectangles together. No credit was gained at Year 6. The total mental age was 4-1; E's chronological age was 5-6. The deviation I.Q. yielded was 71.

The Standord-Binet was also given at the end of Project Head Start, 1966. E. had been less shy and reserved

during this summer than during the 1965 program. However, she had not played an active part in the activities. There had been a passive compliance to suggestions concerning puzzles, cutting, painting, pastings, etc. She spoke seldom. When given the Binet, E. was much the same as before in her manner. The scoring was the same from Years 3 to 4-6. At Year 5 she added the man completion to her scoring. She also earned credit on tying a knot, given instead of definitions. The maze was drawn properly at Year 6, and the ceiling was established at Year 7. The mental age from this testing was 4-4. For her chronological age of 5-9, the resulting I.Q. was 73.

The Frostig Developmental Test of Visual Perception was given in the summer 1965, late spring 1966, and summer 1966. The visual-motor perceptual ages earned, respectively, were: 3-3, 5-0, and 4-9. (The differences in the last two scores were within the standard error.) The mother observed the giving of the second Frostig. She commented that E. should do well on that as ever since the one older brother had begun a class for trainable mentally retarded children, they had played constantly with pencils.

During the winter, the Hiskey-Nebraska and its Morris adaptation had been given. These scores were compared to the previous summer scores on the Hiskey-Nebraska. During the summer of 1965 E. had scored about

six months below her chronological age. On each subtest her winter scores were somewhat higher so that in total neither loss nor gain was actualized and her median score was still about six months below her chronological age.

Interpretation of the information on E. would indicate that she was retarded in her intellectual development on the basis of her language disability. The somewhat consistantly higher non-verbal ability scores tended to indicate that E. was probably at least of low normal intelligence. There was reason to believe that a year in kindergarten will help E. actualize more of her abilities by increasing her acculturation.

E. was slightly below average in her visual-motor development as measured by the Frostig. She appeared to be a child who would be much benefitted from a program aimed at developing perceptual abilities. Conceivably the kindergarten year might provide the necessary stimulation.

Socially E. operated at a definite disadvantage. Limited speech ability in English coupled with a shyness born of many years of disability in English made her reluctant to attempt social relationships. Perhaps in kindergarten she will develop more speech skills and begin to make the social gains that were too slow coming in Project Head Start.

Boy D. was just four when the first Head Start pro-

gram began. He was very small for his age both in height and weight. He had a severe speech defect related to a cleft-palate condition which had been surgically corrected at a state hospital. He was fairly well socialized in the school setting so far as the other children and the staff were concerned, but his general manner was very young. In no way was he negative, rather he simply "went along".

D. lived with his paternal grandparents and their retarded son. Their home was not neatly kept or particularly clean. It might be said that they cleaned only enough to go on living there. The grandfather worked days and the grandmother worked nights. In the mornings it was necessary for D. to arise early as the grandmother drove the son to another town where he had a job. The grandmother then rested as she could during the day. The psychologist reported that during visits to the home the grandmother would excuse herself as quickly as possible and go into the bedroom. That she was taking these opportunities to rest was evidenced by the sound of loud snoring.

It seemed reasonable to assume that D.'s home life was not a very stimulating one. Although the grandmother seemed good-hearted and sincere, there was no doubt that she was very weary from playing the many roles which had fallen due her. Another non-stimulating feature of D.'s environment was the presence of the retarded uncle. The

uncle had a speech defect not unlike D.'s, leading the psychologist to estimate that only part of D.'s speech problems were caused by the cleft-palate.

When D. was first seen by the 1965 Project Head Start psychologist, he was given the same set of tests as the others. He did well enough on these, scoring at an age appropriate level. On the Stanford-Binet the results were as follows:

The basal age was established at Year 3-6. At Year 4, he earned half credit by naming objects from memory, identifying pictures, and discriminating forms. (His speech was poor on picture vocabulary, and the examiner could not be sure whether the answers were correct or not). At Year 4-6, one month credit was earned by pointing to the "prettier" figures. One month was also received for folding the triangle, at Year 5. Year 6 was the ceiling. The total mental age was 3-11 at a chronological age of 4-0. The resulting deviation I.Q. was 96.

When D. was seen in the late spring to evaluate how he had fared during the year, the Stanford-Binet was given again. He was once more a cooperative, pleasant subject. D. had grown a little, but was still small for his age. The most remarkable change was in his speech. Through the encouragement of the psychologist and the state orthoped. hospital, D. had begun taking speech lessons. His enunciation was almost clear and a listener could be reasonably sure of what he was saying.

Such remarkable gain was not shown on the Binet however. D. once more basaled at Year 3-6. At Year 4 he added comprehension to his scoring, but dropped pictorial identification. Comprehension, pictorial similarities and differences, and three commissions were answered correctly at Year 4-6, but he missed the item he received credit for earlier; aesthetic comparison. Once more at Year 5, D. folded the triangle correctly, his highest success. He was then 4-10 and had earned a mental age of 4-1; the resulting deviation I.Q. was 83, considerably below the 96 earned before.

At the end of the summer 1966 Head Start program, D. was readministered the Binet. The same test taking characteristics of pleasantness and cooperativeness remained, but he seemed far more mature and self-possessed than at earlier interviews. The speech lessons had been discontinued and his speech was again less clear. His basal age was 4-6. At Year 5 he earned credit for paper folding, definitions, and copying a square. Two months credit was earned at Year 6 for telling the differences between a bird and a dog, and wood and glass. The ceiling was at Year 7. His chronological age was 5-2, and his mental age was 4-11. The deviation I.Q. produced was 94.

During the winter visits, the Hiskey-Nebraska and the Morris adaptation tests had been given. His scores were better on the low fidelity version, and slightly better than they had been during the 1965 summer testing.

The Frostig Developmental Test of Visual Perception was given at the same time the Stanford-Binets were. The perceptual age scores were: summer of 1965, 3-9; April, 1966, 3-9; summer of 1966, 4-0.

The interpretations given to the above observations were:

Intellectually, D. was probably an approximately average child. The one score which would indicate otherwise was earned in April of 1966 when he had been at home with little in the way of a stimulating environment. It was the psychologist's impression that the dullness of his surrounding had contributed much to his depressed scoring.

Perceptually, D. was in a poorer status at age 5 than at age 4. At 4, his scores had been age appropriate. However, perceptual development, according to the authors of the test, is greatly influenced by the experiences the child has. In his non-stimulating home environment, he failed to make any gains over a nine month period. Although there was no special program aimed at developing perception in Project Head Start in Kearney, in 1966, D. did make a small gain of three months during a three month interval.

Socially, D. has not experienced any major problems. He has been "young-acting" as though he were about six months younger chronologically, but this immaturity has never appeared in socially negative ways such as crying

or withdrawal. The one social disadvantage he did have was his speech problem. The psychologist noted that so much improvement was made while D. was receiving speech therapy. Accordingly, the recommendation was made that he continue to have this special service.

Girl H. was born to parents of Spanish extraction. The parents have since separated, and the mother has become associated with another man. There are a number of older children in the home. Although their relationship was not precise, they acted as would brothers and sisters. Spanish was the common language in the home, but English was common too. The psychologist noted that the members of the family, while watching an English-speaking program, would discuss it in Spanish.

H. entered Project Head Start in the summer of 1965. She was a friendly, out-going child who was quick to play but just as quick to defend her rights to toys or other materials. Other than this her relationships with the staff and her peers was fine. A pretty, well-developed child, H. was neatly dressed. Her long black hair was braided in a handsome heavy rope down her back. When she was seen in late spring of 1966 she was quite eager to return to school. She had much the same personality qualities. However, her personal appearance had changed considerably. She no longer wore the long, neat braid but rather had a short, frizzy hair cut that evidenced

little brushing. Her clothing was also neither clean nor pressed.

Shortly before the 1966 Project Head Start began, Mrs. S., her mother, informed the director that they were moving to another town. Therefore H. did not attend the same program as the other children being written up.

The Stanford-Binet, L-M, was given to H. early in the 1965 program. She was an excellent subject, attentive, interested, and alert. Her one disadvantage was in the English language. Early in the interview a pencil rolled off the table. H. was asked to get it from "under the bed". (This occurred in the nurse's room). H. did not know where to look. Although H. knew unusual words like "camel" in English, she did not know the every day words. The results of the Stanford-Binet were as follows:

H. answered all items correctly at Year 3-6, giving both enumeration and interpretation on responses to pictures. At Year 4-0, she missed the picture vocabulary by one word, but received credit for naming objects from memory and comprehension. Two months were earned at Year 4-6 on pictorial similarities and differences and comprehension. H. was able to draw a man well enough to earn one month credit at Year 5. She attempted to describe what she was drawing, but had no English words for arms, hands, or hair. Another month was earned on pictorial similarities and differences. No credit was earned at Year 6. The mental age was 4-0 for a chronological age of 4-1; the

resulting I.Q. was 98.

When the Binet was given in late spring, H. was quite a different child. In addition to the appearance changes already mentioned, her manner seemed flighty and confused. She was easily rattled by her own ideas or other objects in the room. Although her dog had not barked, several times she said, "Penny, shut up, shut up." Once more she basaled at Year 3-6. At Year 4-0, she made the same errors on picture vocabulary, thereby receiving no credit. She did respond correctly to objects from memory, pictorial identification, and discrimination of forms. At Year 4-6, H. earned credit on aesthetic comparison, pictorial similarities and differences, and three commissions. (She did not score on comprehension as she had before). Although earlier H. had earned credit for the man drawing, this time she outlined the figure instead of completing it. At Year 5 she also scored on paper folding and three definitions. Again, no credit was earned at Year 6. The total mental age score was 4-2 at a chronological age of 4-11; the deviation I.Q. was therefore 83.

During the late winter the high and low fidelity tests, Morris adaptation and Hiskey-Nebraska, respectively, were given. These scores were compared to each other as well as the scores earned on the Hiskey-Nebraska given the summer before during Head Start. They were all quite close together, indicating not only little preference

for either high or low fidelity items but also, the occurrence of little growth since the previous summer.

H. was also given the Frostig Developmental Test of Visual Perception. During the Project Head Start program she scored perceptual ages of 3 years 6 months and 4 years 0 months, both of which were very close to her chronological age. By late spring her Frostig score was 5-0, again quite age appropriate. Her mother, watching her draw, commented that the brothers and sisters let her "write" while they did homework. They may have contributed to her visual-motor skill.

Summarizing the information available on Girl H. would indicate that intellectually she had gone from a normal level of functioning to a level, which if persisted, would be the basis of a recommendation for EMH education. The psychologist in her evaluation of the home felt that there was little there to stimulate H. to develop the potential she had. Conceivably when she begins kindergarten this fall, H. will find a stimulating situation which will assist her in re-establishing her former rate of development.

Perceptually, H. has made normal progress. Perhaps this has been due to the experiences given her by brothers and sisters, but she does have average development in visual-motor skills.

Socially, H. has shown satisfactory skills and attitudes when around other youngsters. At the first Head

Start program she played happily and constructively with the other children. The only exception to this was if she felt someone meant to take her things. In such a case she would hit and scream; however, that was not inappropriate at age four. The later developing flighty, confused mannerisms recorded by the psychologist on three separate monthly visits might have been the product of a long winter and being confined to a stuffy apartment with no out-of-doors play area. This too, may be remedied by entering kindergarten.

Girl W. was four and one-half when she entered the first Head Start enrichment program. At that time she was a very thin, pale child who was subject to severe kidney infections requiring considerable medical attention. In school she wept and sulked excessively so that finally she was placed in another room where she could be with an older, neighborhood girl. Here she did not cooperate consistently with the program's activities; neither was W. self-directive enough to initiate her own activities. When she was requested to do something she was most likely to shake her head in a coy fashion. Should the requestor persist, W. was likely to break into tears, wailing loudly.

W's inability to become a part of the Head Start Project brought her to the attention of the psychologist. When the mother became aware that the services of a psychologist were available at the Project, she became very

anxious to have W. examined. Among W.'s older siblings were three retarded brothers, one of whom was institutionalized. The other two were in educable mentally handicapped classes. At the Nebraska Psychiatric Institute, W.'s mother had been advised to have her examined every two years. Previously, the mother said, W.'s development was six months retarded at two years of age. Pursuing the mother's wishes, the staff of the Project waited for one of W.'s better days, at which time the Stanford-Binet, L-M was administered. The results were as follows:

The basal age was established at Year 3-6. At Year 4, W. was able to respond correctly to only 12 of the picture vocabulary items, thereby failing to score on that item. The other item missed at Year 4 was form discrimination. At Year 4-6, she missed aesthetic comparison, opposite analogies, materials, and comprehension. The Man (Year 5) was given a leg and ears but no arms; the square was drawn three times as a circle; pictorial similarities and differences and patience: rectangles were also missed. No credit was earned at Year 6. The total mental age was computed as 4-2 for a chronological age of 4-7. The resulting deviation I.Q. was 90.

Throughout the test W. was flighty. She was easily distracted by her own thoughts or objects in the room. W. disliked any task which she could not accomplish readily, but gave little indication that she cared if her

responses were correct or not.

(The mother requested information about the results of the testing. She was told that W. had scored "within the normal range" and if she continued her present rate of development would not require EMH classes as had the brothers. There was considerable relief evidenced by the mother upon hearing this report. The psychologist later received a call at home requesting the results once again.)

W. was seen several times during the winter at which times the Hiskey-Nebraska and the Morris adaptation were given. She evidenced the same test behaviors that were reported during the Binet interview. Her manner toward the testing was so variable that the psychologist felt the results were unreliable. Other aspects of her social behavior were more mature as evidenced by her showing of new possessions and telling of recent experiences.

In late April the psychologist once more visited W. Prior to the visit she had talked to W. on the phone and was invited and encouraged to come. At this visit the Stanford-Binet was given again. W.'s manner toward the testing was more serious and determined than before, but her scores were not improved. Her basal age was still 3-6 as the picture vocabulary was not responded to at a high enough level at Year 4-0. All items were correct at Year 4-6. At Year 5 one item was added to the previous scoring; an elongated rectangle about one-third

again as long as it was wide was drawn. No credit was earned at Year 6. The resultant deviation I.Q. was 86, 4 points less than the earlier measure.

W. also participated in a second Project Head Start (1966). At that time she was observed to be much more interested and active in the school activities. She was not only more cooperative with the staff and other children, but also more vigorous about finding interesting things to do. W. shared her painting shirt with children who had none, even without a specific request to do so. She welcomed the psychologist to her room and inquired if she couldn't take some more "tests and things". W. was told that "we might some other day" and from then on never failed to inquire if this was the day. When finally at the end of the program, the psychologist did come for her, W. was quite pleased. Her test behavior was much more directive than before. She proceeded more purposefully than before and refused only one item, the maze tracing. When encouraged to try, W. turned to weeping, and the item was left. This time W. scored her basal at Year 4-6. At Year 5, she failed the copying of a square by excessive elongation; the rectangles (patience) were also missed. Once more no credit was earned at Year 6. The earned mental age was 4-10; the chronological age was 5-7. The resulting deviation I.Q. was 85.

The Frostig Developmental Test of Visual Perception

had been administered each time the Stanford-Binet was given. The perceptual ages earned on the eye-motor test were: 4 years, 6 months; 5 years, 0 months; and 5 years, 0 months.

The interpretation placed upon these observations were as follows:

Intellectually, W. has scored consistantly in the low normal range. Although the scores have not deviated greatly, one from another, there was a gradual lowering present. This was probably more important in as much as the practice effect would have tended to have produced gradually increasing scores. Socially, W. has made her best gains. Perhaps this has been facilitated by her increasingly better physical condition, but whatever the causes, the effects were pronounced. At the end of the second Project Head Start, W.'s social behavior was age-appropriate in most ways.

Perceptually, W. was still retarded in her visual-motor development. There was only a marginal differential between her MA, CA, and PA in the 1965 summer Project. However, in the course of one year, only six months of credit were made on the Frostig test. This left W. about one-half year perceptually deficit.

The general observation indicated by the review of the six case studies was that the year spent at home after the first attendance at Project Head Start was not a

profitable one. Of the six children, five showed deterioration in their test scores over the period. The one child who did not show a depressed scoring came from a home which had the characteristics of upward mobility. On the basis of six subjects only tentative conclusions could be drawn, but these were suggestive of a need existing to have Project Head Start be a continuing experience lasting until entry into school.

CHAPTER V

DISCUSSION OF THE FINDINGS

The specific results for each hypothesis in this investigation were presented in Chapter IV. This discussion of the findings will therefore be of a general interpretive nature, accompanied by the implications of the study. The organization of the discussion will parallel that used in Chapters II and IV.

Intellectual Growth and Change

There were two considerations raised by inspection of the findings. The first of these involved the differences in gains between the Head Start children and the control children. As indicated previously, the Head Start children made intellectual gains significantly larger than those of the control children. Starting with nearly identical ranges and means, the Head Start children were able to make an average mean increment 2.0 I.Q. points greater than that of the controls. That this gain was statistically significant was verified by the correlated t-test of the group data and by the Wilcoxon Matched-Pairs Signed-Ranks T test of the paired data. The interpretation suggested by the findings was that significantly greater growth in intellectual ability was associated with attendance in the Project Head Start summer enrichment program.

The second consideration presented by the data was that both the Head Start children and the control children, separately, made highly significant gains in mental growth during the school year. This conclusion was derived from correlated t-tests of fall to spring gains by each group. The rejection of the null hypothesis was at the 0.001 level; the gains evidenced by these data could have occurred on the basis of chance factors only once in one thousand times. The interpretation to be placed on this evidence was less specific than for the previously discussed consideration. However, conceivably, the kindergarten experience was a highly stimulating one for both groups of disadvantaged children, and accordingly, following the thinking of Bloom (6) a higher rate of development occurred.

The findings of this part of the study were essentially in agreement with those of studies quoted from the Iowa Child Welfare Research Station and the experiments done by Gray and Klaus (23), Smilansky (49), Deutsch (15), and others. While no comparable study existed relevant to the gains made by the control children in kindergarten, Deutsch (16) had indicated that there were positive effects of kindergarten associated with the intellectual growth of culturally disadvantaged children.

Perceptual Growth and Change

Perceptual growth and change was evaluated through

the use of the Frostig Developmental Test of Visual Perception. This instrument was administered to all kindergarteners in the spring and the fall, allowing for comparisons within the total group entering school in Kearney in the school year, 1965-1966, as well as the comparisons of the Head Start children with their controls.

The gains made by the Head Start children and their controls were evaluated by two techniques. The correlated t-test was used to appraise the differences in gains between the two groups. The resulting t value was less than unity, indicating that no significance could be attached to the small differences that did exist between the two groups. The value of the differences between the pairs was assessed by the Wilcoxon Matched-Pairs Signed-Ranks test; here again no significant difference was identified. The indication was therefore that the gains in visual-motor development were no greater for one group than for the other.

At the time of the fall testing, highly significant differences were found between the other kindergarteners and the Head Start children plus their controls. This information would tend to indicate that these two groups of culturally disadvantaged children were not representative of the normal Kearney kindergarten population in visual-motor development. When the Head Start children and the control children were compared as separate groups

to the balance of the kindergarten, the differences were still significant. These findings were in basic agreement with those of Bloom (7), Covington (13), and Deutsch (15) who had also identified perceptual deficits in culturally deprived children.

No special training program existed in the Kearney Public School kindergarten curriculum for the development of visual-motor perception; the training that was given occurred because it was implicit in other programmed activities. When the spring testing was done, the differences in the groups were still highly significant. In addition to this observation, it was noted that the F values had increased, indicating even greater differences among and between the groupings. The head Start children who had initially higher scores than their controls made smaller gains than did the controls so that the spring means were quite similar. The balance of the kindergarten, composed largely of those coming from average and superior cultural environments, made gains no greater than those of the controls. However their initial scores were considerably higher and therefore their final scores were also.

It has already been seen from the experimental results of Boger (8), Covington (13), Weaver (55), and Morris and Morris (38), that culturally deprived children who are initially low in visual-motor perception have, when special training programs were available, made gains which brought them into closer agreement with normal

scores. However, these changes were conditional upon the existence of the special training program. In the kindergarten under discussion such a program was not explicit. Examination of the data and of earlier research would tend to suggest that if culturally deprived children are to acquire normal visual-motor perception, training programs relevant to this objective must be instituted.

Achievement Growth: Changes in Reading Readiness

According to the authors of the Metropolitan Readiness Test, each subtest contributed to the evaluation of a separate aspect of readiness for reading. The subtests have therefore been kept separate in the discussion of the findings. In concurrence with this it was noted that there was considerable variation in the means of the three groups (Head Start, Control, and the balance of the kindergarten) from subtest to subtest. Emperically, therefore, it appeared that there was indeed evidence to support the assertion that the four subtests measured more or less mutually exclusive parameters of readiness.

Word Meaning:

Although the differences in gains in word meaning between the Head Start children and their controls were not statistically significant at a level appropriate for rejection of the null hypothesis, it was noted that the

larger gains were in favor of the experimental group. The extent of these non-significant differences were reflected in the spring F values which were smaller (although still highly significant) than were the fall F values. Other evidences of these differences were indicated by the gains for the year of the three groups. These data would tend to indicate that the Head Start children were in the most desirable position to gain in word meaning. At the same time it should be noted that in spite of these gains, the Head Start children, as well as their controls, had spring scores which were lower than the other kindergarteners' fall scores.

These data were essentially in agreement with Siller (44), John and Goldstein (32), Thomas (51), and Figurel (21) who found that the culturally disadvantaged child had poorer verbal abilities than did his classmates from middle-class homes. Thomas and Figurel were particularly explicit about what this vocabulary deficit meant to the culturally deprived child as he began to read words that probably held very little meaning for him.

Sentences:

In the subtest, Sentences, it was once more found that the Head Start children were slightly above the control children in their scores. This difference was not statistically significant, and accordingly no conclusions were made concerning the two groups. However when these

two groups were compared, whether separately or together, with the other kindergarteners, very marked differences were noted. In both the fall and spring analysis, the F values were highly significant. Examination of the means indicated a situation much like that in the subtest, Word Meaning. Good sized gains were made by not only the Head Start group, but also the control group. Moreover these gains were larger than the gains of the other kindergarteners. The source of the continued differences lay in the initial scores of the disadvantaged children. These were so low that even the large gains made were not sufficient to make the spring scores appreciably larger than the fall scores of the average and privileged cultural group.

The findings of this subtest therefore were supportive of the conclusions drawn by Thomas (51), who had found culturally deprived children weaker than middle class children in sentence structure. The data relevant to the gains made by the culturally deprived children was in general agreement with the findings of the Brazziel and Terrell study (10). They found that with special training culturally deprived children could be stimulated to compare favorably to national norms whereas the control children were significantly lower. Essentially the same results were tabulated in the Weikert, Kamii, and Radin experiment (56); the experimental children scored higher than the control children on the various readiness subtests.

It should be noted at this point that the Kearney Public School had no specific kindergarten training program for the disadvantaged children; they participated in the same sorts of readiness activities and did the same workbook exercises as the rest of the kindergarten. Nonetheless they were able to make greater gains than did the more privileged children.

Information:

Although there was a slight superiority shown by the Head Start children over the Control children, the most notable point in the information subtest was the relationship of the scores of the culturally deprived children to those of the culturally advantaged. In the fall measures the disadvantaged children scored approximately two points less than the other kindergarteners. During the year, the Head Start children made good progress, making a mean increment of 1.5 while the controls gained 0.8 and other kindergarteners gained 0.9. This gain for the Head Start children was therefore quite noteworthy. However, their gains were not great enough to bring their spring scores up to the mean fall scores of other kindergarteners. The culturally disadvantaged children who had not attended Head Start had fallen still farther behind by virtue of their small increments as evidenced by the mean scores for fall and spring and the increased size of F in the spring analysis. The data

suggested therefore that in spite of the relatively greater gains by the Head Start children, these were not sufficiently large enough to put them on a competitive basis with the other kindergarteners. The culturally disadvantaged children who did not attend Head Start fared still less well in their level of information.

These conclusions were supported by other research in this area. The barren experiential background of the culturally disadvantaged child has been recounted by Deutsch (16, 17). Their lack of information about the world was related to their depressed abilities to categorize and generalize according to the studies by John (33) and John and Goldstein (32). Vocabularies have also suffered from the delay and paucity of experiences. That these deficits can be corrected has been demonstrated in earlier research by Weikart, Kamii, and Radin (56) and Brazziel and Terrell (10), provided special programs were utilized.

Matching:

Although there were no significant differences between gains made by the experimental and the control children, unusually greater progress was made by the culturally deprived children on this subtest than on the other parts of the Metropolitan Readiness Test. Whereas in the previous subtests the spring scores of the culturally disadvantaged children barely approximated or

failed to reach the fall level of the other kindergarteners, in the Matching subtest both groups of disadvantaged children doubled their fall scores by spring. In so doing they surpassed the fall scores of the other kindergarteners. These remarkable increments of nearly 100% were compared to the 28% gains of the other children. In as much as all groups were exposed to the same readiness materials, the conclusion suggested by the data was that the culturally advantaged children came into kindergarten with a greater portion of their ability to match abstract figures already developed, hence the smaller gains during the year. Following the same line of reasoning, it was suggested by the data that the culturally disadvantaged children made comparatively large gains as evidenced by the mean gains (Head Start, 7.0; Control, 6.4; others, 3.5), and also by the change in the F values from fall (49.90) to spring (15.18). There was also some suggestion from inspection of the readiness materials that the training received by the children in this area was more relevant to the Matching subtest than it had been to the other subtests.

Review of related literature had revealed findings not dissimilar to these. Jensen (29) and John (33) had noted deficiencies in the lower-class children's ability to detect perceptual similarities. A limitation in their ability to discriminate had been found by John and Goldenstein (32). These deficits for culturally deprived children have been quite responsive to specific training

according to another research study which also used the Metropolitan Readiness Test (10). Covington (13), using materials designed to attract attention to abstract figures, found that lower-status children, who were initially significantly lower than upper-status children, made large enough gains that their scores were not significantly different at the end of the experimental period.

Totals:

Although no significant differences appeared for each of the subtests in the Metropolitan Readiness Test, there had been in each a small lead favoring the Head Start children over the control children. The cumulative effect of this was to produce a total difference between the two groups which was appraised as being significant at the 2% level by the nonparametric test and as highly significant (1% level) by the t-test. The evidence therefore supported a conclusion of superior gains in reading readiness by the Head Start children.

Comparisons of the culturally disadvantaged children with the other kindergarteners led to results with other implications. In the fall measure the mean readiness score for the disadvantaged children was rated as "low normal" whereas for the other children it was rated as "average". During the year the Head Start children made a mean increment of 12.6 points compared to 9.4 for the controls and 6.9 for the others. These gains were great enough to allow

the Head Start children, but not the control children, to surpass the fall scores of the other children. However, the gains of the other children were great enough to cause them to be classified as "high normal" while both groups of disadvantaged children were rated as "average" in the spring. Inspection of these data therefore indicated that although the culturally disadvantaged children, particularly the Head Start group, were able to make considerable gains over their own fall scores, their spring scores were nonetheless best compared to the other children's fall scores.

These results were in general similar to those of other reported researches. In the Ypsilanti study (56) using the Gates Reading Readiness Test, it was reported that the experimental children scored higher than the control children on all five subtests. Similar results had been found when an experimental group of disadvantaged children were given a special training program in readiness while the controls received the traditional readiness experiences (10).

The evidence of this study and the reviewed researches would tend to indicate that greater gains in reading readiness were associated with attendance in special preschool or enrichment experiences. There was also some suggestion that the stimulation of kindergarten produced substantially large gains even without prior attendance in an enrichment program. The higher initial scores and lower

gains of the privileged kindergarteners were suggestive of the conclusion that these children had actualized much of their potential before entering school and consequently had only a small amount to actualize through the year. Tentatively, it might be interpreted, the gains were due somewhat to the stimulation of kindergarten but due more to maturation.

Drawing a Man:

In the fall, the drawings of the Head Start children and the control children were quite similar. Improvement occurred in the drawings of both groups throughout the year. However, the larger gains made by the control children were not enough greater to be found significant. Why such a gain should have appeared at all was a point of interesting specualtion. The balance of the achievement and aptitude data would have more likely predicted greater gains in the Draw-a-Man subtest for the Head Start children. Conceivably other factors were operating when the children were requested to "draw a man". One of these may have been described by such terms as "freedom to express oneself rather than submit to the request of an authority figure". Perhaps the scoring suggested by the Metropolitan Readiness Test was not close enough to the Goodenough and Harris standards to infer directly a measurement of intelligence from the drawing ratings. The most reasonable conclusion suggested by these data was that

additional studies would be necessary to determine whether this detected difference was a product of chance, of the permissive atmosphere of the Head Start school operating in a latent fashion, of the scoring criteria, or of some other factor not discerned during this study.

Social Growth and Adjustment

Evaluations of the gains in social growth made by the Head Start and the control children were evaluated by both parametric and non-parametric tests. In neither case was there indication of any significant differences in gains existing. This finding was not in agreement with the literature reviewed earlier in Chapter 2. Therefore, another question seemed appropriate in the investigation: Had the two groups of children made significant gains during the year when compared to their own earlier ratings? The correlated t-test was done for each group to compare fall scores to spring scores. For the Head Start children the differences in the two sets of scores were significant at the 2% level, i.e., the differences that were noted could have existed on the basis of chance twice in one hundred samplings. A t value significant at the 5% level was identified for the control children. The conclusion suggested by these data therefore was that although both groups made significant gains in their social growth and adjustment during the school year, there was no significance in the differences of the gains between the two

groups. The evaluations did detect a slight superiority on the part of the Head Start children. Observations made by the investigators in the classroom settings led to the following evaluation of the social climate of the kindergarten classes: the overall air was one of relaxation and permissiveness within bounds. Visiting and interaction were quite common and generally accepted so long as they did not interfere with the activities otherwise. The approach of the teachers was to substitute desirable activities in place of undesirable ones instead of resorting to negative reinforcement. The children were quite outgoing, lively with a measure of self-discipline, happy, and receptive to suggestions and requests. The effect of such a kindergarten environment would therefore be not unlike the atmosphere of a preschool program. Conceivably it was because this environment was so beneficial to both groups of culturally disadvantaged children that no significant differences existed between them by the end of the school year.

Effects of Variable Fidelity In Visual Stimuli

The only significant difference found in all of the tests run between and within the two groups with the high and the low fidelity pictures was in favor of low fidelity pictures in the subtest, Picture Association. In other words, black and white line drawings were utilized better than full-color photographs when both groups of

these culturally disadvantaged children were required (a) to look at a pair of pictures and identify a common concept, i.e., both are fruit, both make music with strings, etc., and (b) to indicate from another set of four pictures the one which also shared this concept. This finding raised more questions than answers, but there were at least three general considerations which should be mentioned at this point as possible explanations. Conceivably one or more of these could have been operating during this experiment:

1) In the construction of the low fidelity pictures which were black and white line drawings, the artist may have had the concept embodied in the item fixed in his thinking. Were this the case, it would be quite plausible to believe that he drew with an intent, whether conscious or unconscious, to make that concept a central theme in the pictures involved in the item. Possibly the outcome of this would have been to make the item easier.

2) On the other hand, it has been asserted that the culturally disadvantaged child is perceptually deficient, that is, he looks but does not see. This is only another way of saying, "The child does not separate the figure from the ground." Examination of the high fidelity color photographs indicated that much more ground was used in making these stimulus figures, i.e., the frog sat on a leaf-covered log. This would tend to add perceptual complexity to the task.

3) A third possibility might be based on the general ideas concerning the age at which children respond to color and the age at which they respond to form. However, before this possible explanation can be evaluated with any degree of confidence some experimentation will have to be done to identify this color/form significance among culturally deprived children. To the degree that it might be a function of experience, the developmental rate for disadvantaged children might vary from that of average or privileged children.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purposes of this study were to assess the effectiveness of the Head Start preschool program in preparing four-and five-year-old children for school experiences and to evaluate certain perceptual characteristics of the disadvantaged children who had been enrolled in this program. This research was a continuation and an extension of evaluations initiated during the Project Head Start in Kearney, Nebraska, during the summer of 1965.

The aspects of development assessed in the research study were a) intellectual, b) perceptual, c) acheivement, and d) social. The instruments used to assess this development were, respectively, the Stanford-Binet, L-M, the Frostig Developmental Test of Visual Perception, the Metropolitan Readiness Test, and the Kearney Public School Pupil Progress Report. The perceptual responses to stimuli of variable fidelity were assessed by two tools, the Hiskey-Nebraska Test of Learning Aptitude, and the Morris adaptation of it.

A. Intellectual Development. Previous studies, typically done in large city areas with slum children as subjects have indicated that significant mental growth was fostered when children were enrolled in enrichment programs. Usually these were programs of greater than eight week duration. The average I.Q. of deprived children, on the

basis of these studies, has been estimated as about 90. At the end of the enrichment period the children tended to score somewhat higher so that the mean came closer to the national norms.

In the present study, the control children and the Head Start children began with almost identical means and ranges of scores on the Stanford-Binet, L-M. The mean score for the Head Start children was 89.3; it was 89.8 for the controls. At the end of the kindergarten year, the Stanford-Binets were repeated. By this time both groups neared the national norms. However, the Head Start children, with a new mean of 99.2, were statistically significantly higher than the control group with a new mean of 97.7. The significance held true whether the scores were examined on a group basis with a correlated t-test or on an individual basis with a non-parametric T test. Now scores of both groups were higher than their original scores; the t-test for this exceeded the 0.001 level of significance. The conclusion reached therefore was that the changes occurring in the culturally deprived children in this study were comparable to those in metropolitan studies.

B) Perceptual. The concensus of earlier studies in the literature indicated that culturally deprived children were perceptually deficit. Other studies gave evidence which supported the position that these deficits could be remedied if programs existed aimed at that objective. In

the Kearney schools no such program was included in the kindergarten curriculum. The Head Start children came into kindergarten from Project Head Start where they had been given special training in visual-motor perception. At the beginning of the year they were about three months ahead of the controls in their perceptual age. Without the benefits of a perceptual development program, they lost this lead by the end of the year by virtue of the greater development of the control children. The culturally average and advantaged children who had been significantly higher in the fall made gains too which kept them significantly higher in the spring. These results would tend to suggest therefore that if disadvantaged children are to make and hold gains in visual-motor skills, they must participate in a program designed for this.

C) Achievement. The results of earlier studies have observed that culturally disadvantaged children tended to lag behind the rest of the population in the level of achievement attained. However, where these children have been given special enrichment programs aimed at correcting these deficiencies rather startlingly large gains have been made. Some of the gains have exceeded those made by the children who were culturally average or advantaged.

Similar findings held true in this study. Although there was no special enrichment program continued into kindergarten, the Head Start children and their controls did make larger gains in achievement over the year than

did the other children not judged culturally deprived. The Head Start children however, made significantly greater gains than did the control children; the difference in gains was highly significant.

In spite of these gains which ran from one and one-half to two times larger than those of the other kindergarteners, the culturally disadvantaged children fared poorly in their spring scores. The reason for this was that the fall test scores were so low that even these great gains were not large enough to put the culturally deprived child into a competitive relationship with the other kindergarten children. The spring mean score of the Head Start group exceeded the fall mean score of the balance of the kindergarten by 1.2 points. The spring mean score of the control group was smaller than the fall mean score of the balance of the kindergarten by 2.3 points. In other words, the culturally deprived children, after a full year of schooling, were no better equipped to begin reading than the average and advantaged cultural group was when kindergarten started.

D) Social Growth. Variable results have come from studies of social growth and adjustment among children who attended nursery schools. Some research concluded that the effects of nursery school were positive. Other researches have found that the ratings favor the children who did not attend nursery school. At any rate, these researches have been done primarily with middle class

children, and therefore the results were of dubious relevance. The results of the present study have supported neither position. The psychologist, in making observations of the kindergarten room climates, found that the class environments were so favorable for social interaction that they could not be distinguished from a desirable nursery school climate. The conclusion was made, therefore, that while the Head Start children had slightly greater gains in social adjustment, these did not become significant because the control children too had been exposed to a highly desirable environment.

The second purpose of this study was to identify whether changes in the quality of a visual stimulus would produce changes in the responses of culturally disadvantaged children. The results of this study indicated that it made no difference whether the stimulus was a low fidelity black and white line drawing or a high fidelity color picture of the real object when the children did the subtests requiring them to:

1. Identify the one picture in a set of four which was identical to a stimulus picture.
2. Construct a block arrangement like the one shown.
3. View pictures for a controlled period of time and then identify them in another group.

However, when the children were asked to view a pair of pictures having a common concept, and then select from four other pictures one having the same concept, the

children were significantly higher on the low fidelity stimuli.

Why this should have happened was a fertile field for hypothesizing. Three possible answers were given: 1) The clues in an artist's drawings might be more "to the point" than in a photograph. 2) Because there was necessarily more "ground" in the photograph, the "figure" may have been less distinquishable. Possibly the inability to separate figure from ground is a perceptual deficit of the culturally deprived child. 3) There have been researches done to identify the ages at which children prefer form or prefer color. These studies probably have been done with middle class children. Conceivably, the developmental stages in lower class children may be different from the groups included in such studies. Accordingly, it may be that the form versus color conflict emerged on this subtest. Resolution of these hypotheses would require additional studies, however.

Beyond these rather precise conclusions based upon the results of this experimental study there were other more general, but nonetheless, pertinent and important, conclusions suggested by a combination of the evidence from the study and the observation made by the persons conducting the study.

Although Kearney has no great blighted areas like those found in metropolitan areas, the effects of cultural

deprivation were found in the lives of the children in this study. The same characteristics noted in earlier studies conducted in large cities were found for the children of this small, rural town located in a rich Midwestern river valley. The researchers were surprised to visit "passable looking" houses and find plaster missing from the walls or the dirt showing through a hole in the wooden floor. One day while visiting a rather run-down home located among some others of rather average appearance, the psychologist witnessed the family tom cat catching a mouse on the kitchen table (much to the amusement of the housewife.) The prey was then taken to the bedroom for eating. In another home the kitchen table had to be scrubbed before the psychologist could put her materials down. Apparently the encrusted egg had come from another day's meal as that morning's fare, cereal, was still on the table. Do children coming from these environments have a different experiential background than the girl trudging to school in her "Winnie the Pooh" dress, album under arm? It seems reasonable to conclude that they do. The culturally deprived child has had a wealth of experiences but these are probably not the ones contributing to success in school, or for that matter, to success in intelligence tests.

Can these experiential deficits be altered? Study after study, including the present one have suggested that given special education these culturally deprived child-

ren do learn, and that they make gains even greater than those of the average and advantaged cultural groups. In the present study, as in others. it was found that the children given the enrichment program plus kindergarten were able to make significantly greater gains than the controls who had only the kindergarten experience.

The challenge at hand is how to implement what has been established regarding these children. The observations of the persons making the present study have led them to recommendations similar to those made by Bloom, Davis, and Hess (7, pp. 17-19) in their book, Compensatory Education for Cultural Deprivation.

1. "Nursery school and kindergartens should be organized to provide culturally deprived children with the conditions for their intellectual development and the learning-to-learn stimulation which is found in most favorable home environments."

That these will be different from the nursery schools conducted for the usual middle class child cannot be stressed too much. Culturally deprived children are not immature middle class children. They have a wealth of experience and skills: however, these are not the ones which contribute to success in school. Accordingsly, their preschool education is "compensatory", and is aimed at giving the child the experiences and skills that he would have acquired otherwise from a middle-class rearing. In addition to the good experiences with puzzles, stories, blocks, etc. already found so beneficial in Head Start Projects, these preschools should also provide for:

a. Opportunities to expand their vocabularies to cover the objects in their experiences and the relationships within their experiential world.

b. Development of language in terms of units of whole thoughts rather than only isolated words or phrases.

c. Development of their perceptual potential so that they look and see and know what they have seen, so that they hear, and identify the sound, and so that they can coordinate the various aspects of their perception.

d. Stimulation of interest in the world about them so that this interest leads to a desire to know more, to examine more carefully, and to learn more about related learnings. With these interests will come the larger spans of attention so necessary for future education.

2. "A national commission composed of teachers and other specialists should be created to coordinate and to develop curricular guidelines, materials, and methods for this special type of nursery school - kindergarten."

Because the culturally deprived child does not have the same background as the middle class child, those designing the curricular ideas for these schools may not be the same persons who design other curricular materials. One set of individuals upon whom such a commission would lean heavily would be teachers who have demonstrated success in working with young, culturally deprived children. When considering the kinds of materials to be used for the children, the values of the lower class families must be respected. Although they may see little value in art projects which show much individualism, there is no need to scrap these projects if they are defensible in terms of program objectives. The need does exist however to teach these children things of concrete, workable

significance for as Riessman (42) has pointed out, things that work are things of value in a culturally deprived family. So far as methods are concerned, very good suggestions abound. One of the most likely of these may be the Montessori method which has been found successful with slum children in Italy as well as middle-class and upper-class children in the United States.

3. "The teacher for this new type of nursery school-kindergarten should be carefully trained for the very specific set of tasks they must assume. Essentially, these teachers should be trained to do for many children what very good parents can do for a small number of their own children."

In the recent Project Head Start programs there have been short teacher training programs preceeding the eight weeks of school. There was little question that these have been helpful. On the otherhand, these teachers were still somewhat inexperienced and have needed resource persons to answer special questions. It is unlikely that the educational system can hope to produce the number of teachers needed to work with culturally deprived children. Therefore, it will also be necessary to look for staff among the untrained and the partially trained, adolescents and housewives, and so on as well as among the professionals.

4. "The parents must be sufficiently involved in the nursery-kindergarten to understand its importance for their child and to give support and reinforcement to the tasks of these special schools. The parents should be so committed to this type of school that they are willing to do everything possible to insure the continuity of the child's school experience."

Experiments have been reported in which the homes of the culturally disadvantaged children were regularly visited. This technique was associated with large gains on the part of the children. In the present study there were five children who went to the 1965 and 1966 summer programs. Unfortunately there was no program available for them in the intervening winter. Four of the five who returned to their homes with no outside educational program scored lower on the tests of intellectual ability by spring. Had there been a program which would have sustained the interest of the parents this might not have happened. Another point to consider concerning these parents was that they too may need the supportive help that comes from an enrichment school for their children. As Riessman has pointed out, they must cope with a very difficult environment.

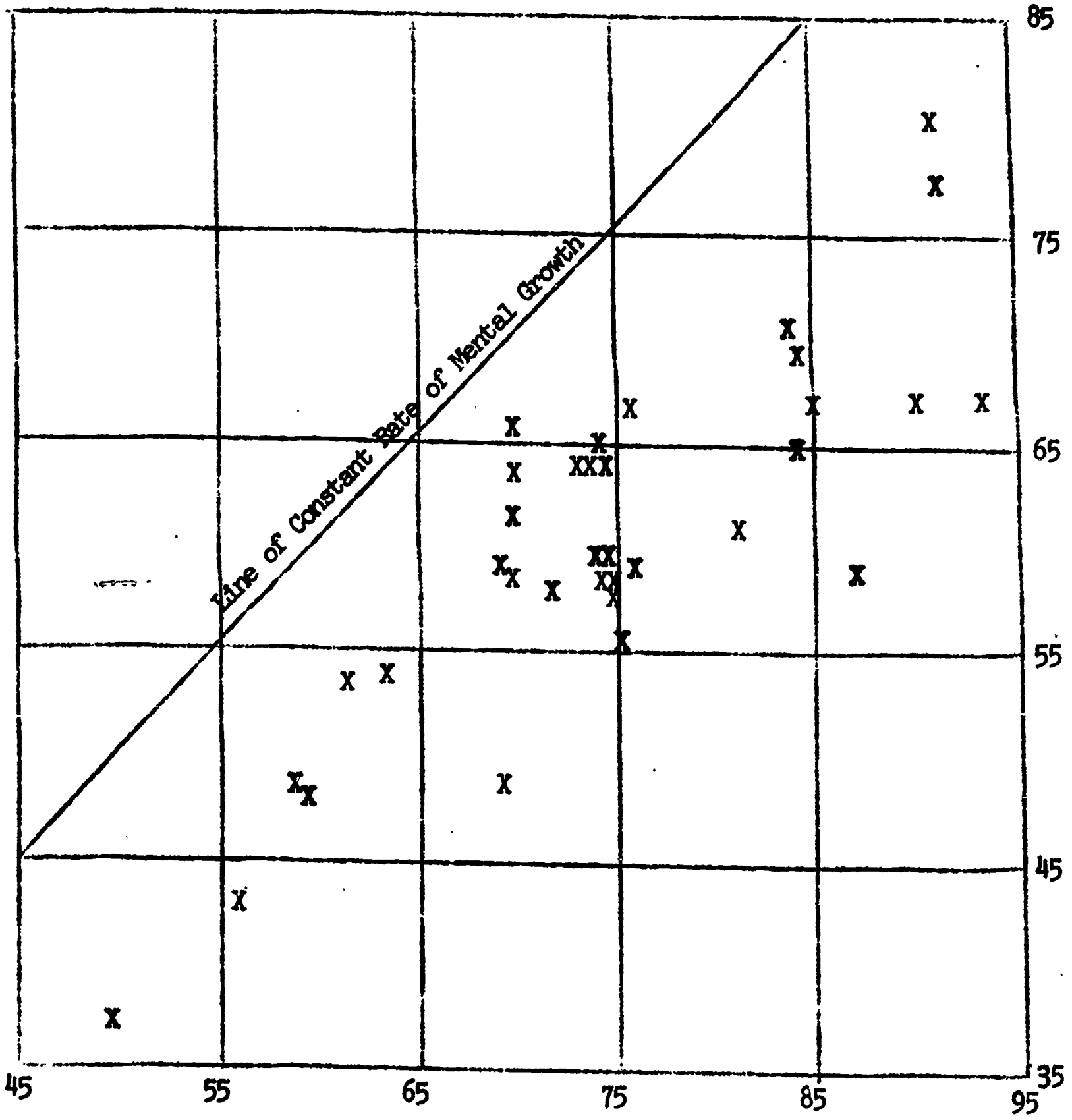
In summary of the present study, it can be stated that the children who were enrolled in the Project Head Start enrichment program did gain significantly more in their kindergarten year than their controls who had no enrichment experience. It was also concluded that these two groups of culturally disadvantaged children made greater gains during the year than did the culturally average and advantaged children. However, despite these large gains, there was evidence to indicate that as a group they did not resemble the balance of the kinder-

garten children either in their visual-motor perception or their achievement.

The evidence gathered relative to stimulus fidelity indicated a need for more studies concerning the visual perception development of culturally disadvantaged children and their ability to abstract a concept from high and low fidelity pictures.

Chart 1

Scattergram of Stanford-Binet
Fall and Spring Mental Age Scores



Spring Mental Ages on Stanford-Binet

Blue Control
Red Experimental

TABLE 1

Wilcoxon Matched-Pairs Signed-Ranks Tests
of Gains in Measured Variables
for Head Start and Control Children

Characteristic	Number	T	Level of Significance
1. Stanford-Binet Mental Age	17	33.0	0.02
2. Frostig Visual-Motor	17	54.5	
3. Metropolitan Readiness Test			
a) Word Meaning	14	22.0	
b) Sentences	14	51.5	
c) Information	16	50.5	
d) Matching	16	55.0	
e) Total	18	30.0	0.02
f) Drawing a Man	11	25.0	
4. Social Growth	16	64.0	

TABLE 2

Correlated t-tests of Increments Made
by Head Start and Control Children

Characteristics	t-value at 17 degrees of freedom	Level of Significance
1. Stanford-Binet Mental Age	2.36	0.05
2. Frostig Visual-Motor	.78	
3. Metropolitan Readiness Test		
a) Word Meaning	1.90	
b) Sentences	0.	
c) Information	1.79	
d) Matching	.45	
e) Total	3.33	0.01
4. Social Growth	.20	

TABLE 3

Analysis of Variance of Frostig Visual-Motor Scores for Head Start, Control and Other Children

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Fall Testing			
Groups	2	129	64.50
Within	279	2982	10.69
Total	281	3111	
$F_{2,279} = 6.03^{**}$			
Spring Testing			
Groups	2	169	84.50
Within	288	3070	10.77
Total	290	3239	
$F_{2,288} = 7.85^{**}$			

TABLE 4

Analysis of Variance of Metropolitan Readiness Test Scores for Head Start, Control, and Other Children

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
WORD MEANING	Fall Testing		
Groups	2	119.66	59.83
Within	293	1244.98	4.25
Total	295	1364.64	

$F_{2,293} = 14.08^{**}$

WORD MEANING	Spring Testing		
Groups	2	122.41	61.21
Within	292	1410.80	4.83
Total	294	1533.21	

$F_{2,292} = 12.67^{**}$

SENTENCES	Fall Testing		
Groups	2	138.01	69.01
Within	293	1566.91	5.35
Total	295	1704.92	

$F_{2,293} = 12.90^{**}$

SENTENCES	Spring Testing		
Groups	2	63.84	31.92
Within	292	959.19	3.28
Total	294	1023.03	

$F_{2,292} = 9.73^{**}$

TABLE 4 (cont.)

Analysis of Variance of Metropolitan Readiness Test Scores for Head Start, Control, and Other Children

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
INFORMATION	Fall Testing		
Groups	2	129.51	64.76
Within	293	1615.82	5.51
Total	295	1745.33	
$F_{2,293} = 11.75^{**}$			
INFORMATION	Spring Testing		
Groups	2	108.64	54.32
Within	292	565.25	1.94
Total	294	673.89	
$F_{2,292} = 28.00^{**}$			
MATCHING	Fall Testing		
Groups	2	976.36	488.18
Within	293	5749.48	19.62
Total	295	6725.84	
$F_{2,293} = 24.88^{**}$			
MATCHING	Spring Testing		
Groups	2	184.41	92.21
Within	292	3367.04	11.53
Total	294	3551.45	
$F_{2,292} = 8.00^{**}$			

TABLE 4 (cont.)

Analysis of Variance of Metropolitan Readiness Test Scores for Head Start, Control, and Other Children

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
	Fall Testing		
TOTAL			
Groups	2	4212.2	2106.1
Within	293	25700.9	87.72
Total	295	29913.1	

$F_{2,293} = 24.01^{**}$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
	Spring Testing		
TOTAL			
Groups	2	1903.0	951.50
Within	292	13534.6	46.35
Total	294	15437.6	

$F_{2,292} = 20.53^{**}$

TABLE 5

Mean Scores and Increments for
Mental Age, Visual-Motor Perception
and Reading Readiness

Characteristic	Fall Mean Score			Spring Mean Score			Increments		
	HS	C	O	HS	C	O	HS	C	O
1. Stanford-Binet, I.Q.	89.3	89.8	-	99.2	97.7	-	9.9	7.9	-
2. Visual-Motor Perception	9.6	8.6	11.0	11.1	10.9	13.3	1.5	2.3	2.3
3. Reading Readiness									
a)Word Meaning	13.8	14.2	15.9	15.8	14.4	16.9	2.0	0.2	1.0
b)Sentences	7.9	7.4	9.7	10.0	9.4	11.1	2.1	2.0	1.4
c)Information	10.4	10.3	12.4	11.9	11.1	13.3	1.5	0.8	0.9
d)Matching	7.0	6.8	12.5	14.0	13.2	16.0	7.0	6.4	3.5
e)Totals	39.1	38.8	50.5	51.7	48.2	57.4	12.6	9.4	6.9

HS - Head Start
C - Controls
O - Other Kindergarteners

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