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AN EVALUATION OF A PRESCHOOL TRAINING PROGRAM FOR CULTURALLY DEPRIVED CHILDREN. FINAL REPORT.

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TO FIND OUT IF CULTURALLY DEPRIVED CHILDREN SHOW CHANGE IN ACADEMIC READINESS AS A RESULT OF SPECIAL PRESCHOOL PROGRAMS, 3 GROUPS OF CHILDREN (14 TO 17 IN EACH) IN 3 DULUTH SCHOOL AREAS WERE PRE- AND POSTTESTED WITH THE STANFORD-BINET AND SRA PRIMARY MENTAL ABILITIES TESTS. A CONTROL GROUP OF 30 CHILDREN FROM THE SAME 3 SCHOOL AREAS WERE GIVEN THE TESTS BUT DID NOT ATTEND PRESCHOOL. THE REGULAR HEAD START CURRICULUM WAS USED IN 1 PRESCHOOL GROUP WHILE A SECOND GROUP WAS GIVEN SPECIAL CREATIVE MONTESSORI PLAY EQUIPMENT IN ADDITION TO THE HEAD START CURRICULUM. A THIRD GROUP OF CHILDREN HAD THE SAME EQUIPMENT AND EXPERIENCES PLUS A PARENT COORDINATOR WHO VISITED EACH CHILD'S PARENTS 3 TIMES DURING THE SUMMER PROGRAM IN AN EFFORT TO INCREASE FAMILY INVOLVEMENT. ALL CHILDREN WERE RETESTED AT THE END OF THE KINDERGARTEN YEAR TO SEE HOW THE EXPERIMENTAL AND CONTROL GROUPS COMPARED WITH EACH OTHER AND WITH KINDERGARTEN PUPILS IN PREVIOUS YEARS. ANALYSIS OF VARIANCE OF THE DATA SHOWED THAT THE ACADEMIC POTENTIAL OF DISADVANTAGED CHILDREN CAN BE INCREASED BY PRESCHOOL TRAINING INASMUCH AS THE CONTROL GROUP CHILDREN DID NOT SHOW IQ INCREASES WHILE THE IQ'S OF THE EXPERIMENTAL GROUPS INCREASED. THIS INCREASE WAS RETAINED DURING THE KINDERGARTEN YEAR. THERE WAS NO SIGNIFICANT DIFFERENCE IN THE EFFECTIVENESS OF 1 PROGRAM OVER ANOTHER ALTHOUGH TOO LITTLE TIME MAY HAVE ELAPSED FOR POSITIVE MONTESSORI AND PARENTAL INVOLVEMENT EFFECTS TO APPEAR. (MS)

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**FINAL REPORT**

**Project No. 3-290**

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**October 1967**

**U.S. DEPARTMENT OF  
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Project No. 3-290  
Contract No. OE-5-10-349

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Richard F. Weatherman  
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October 1967

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## Chapter 1

### INTRODUCTION

#### The Problem

It is well known that children from lower socio-economic families frequently experience difficulties and failure in school. The critical problem of providing these culturally deprived children with successful educational experiences is the focus of national attention; governmental and private agencies are sponsoring experimentation with special classrooms and novel educational procedures for them. The research literature indicates that these children do not function at the level predicted by their abilities and that they are frequently retained one or more grades, and often drop out. They tend to become marginally employable citizens and to create economic, social, and psychological problems for the society as well as for themselves.

The culturally deprived child has been defined as "the child deprived of a way of life that would encourage him to become a contributing member of our society, to achieve stature and self-reliance as a person, to have his own reason for being." (24,p.70) It appears evident that these children often enter the school situation without a sufficient background of the kind of readiness experiences that would enable them to succeed in academic programs. They may lack background information or vocabulary; they may have difficulty in communicating or in participating in groups; they may have assimilated parental attitudes of disdain or even hostility toward education, or come from homes where parents are unable to stimulate or motivate them.

There is a growing body of literature indicating that the lack of early parental and environmental stimulation is a prime factor in educational failure. Larson and Olson (22) point out that "while increased attention to disadvantaged children is important at any level, the experience of the past four years suggests that the prevention of educational disability is more logical and more feasible than the correction of it."

The magnitude and cost of this national problem are difficult to over-estimate. One estimate is that by 1970 in certain large cities there may be one culturally deprived child for every two children enrolled (33). Chansky (9) reports that the retained child is less mature and less well adjusted than the normal child. Other studies (9) indicate that failure or retention may have a strong detrimental effect on the child's motivation



to learn. While it is impossible to measure the emotional costs of retention, it is pertinent that in the City of Duluth, for example, the approximate cost to the schools per child per year retained is \$500. In the Retention Report<sup>1</sup> for the Duluth Public Schools, July 1, 1964, it is reported that a large percentage of Duluth high school dropouts had been retained one or more years in their early school experience. It is also reported that 43 kindergarten children were retained out of a total of 2,575. Thirteen of these or 31% of the retained kindergarten children, came from one school with a total kindergarten enrollment of 150, which is 8.6% retention as compared with a city kindergarten average of 1.6% retention.

Since failure for these culturally deprived children begins early and forms the basis for continued failure and since the evidence indicates the importance of early stimulating experiences to later school success, it becomes vitally important to attempt ways of providing appropriate preschool readiness experiences and to test their value in laying the foundation for successful educational experience.

#### Review of the Literature

In The Culturally Deprived: Educating the Disadvantaged, Charles Mitchell points out the fact that in large cities there are strong concentrations of families whose children are "---severely hampered in their schooling by a complex of community, home, and school conditions." (26) He also reports that one-third of our school children fall into this disadvantaged group.

What are the characteristics of the culturally deprived child? Deutsch (13) states that cultural deprivation causes frustration; the child does not understand and he does not succeed; he has a negative self-image and a low evaluation of his own competencies. Riessman and others (12, 13, 33) describe the culturally deprived child as typically slow, ineffective in reading, suggestible, inadequately informed. The Office of Economic Opportunity maintains that there is growing evidence for the following generalizations concerning "disadvantaged children":

They tend to do poorly in language; they have small vocabularies and often seem unable to speak up and out; they sometimes don't know the names of things, or even that things

---

<sup>1</sup> On file at the Administration Building, Duluth Public Schools

have names; they may not have experienced any environment other than their own house or apartment; they may appear to feel uncertain of who they are, what they look like; how they fit into their world; they often seem to be lacking in curiosity; they often have never before seen or worked with pencils, paper, crayons, scissors, puzzles, blocks, or books; and frequently they do not know how to use them in play; they often have difficulty with authority figures, so that having to do what the teacher expects, and class discipline requires, seems at first incomprehensible to them; they tend not to respond to the teacher until she proves herself trustworthy and sympathetic, and becomes the focal point for their school activities." (28)

Ausubel (3) reports that these children have poorer test-taking skills, are less easily motivated, and do not respond to speed pressure as well as do middle-class children. He states that even when these factors are controlled, basic intellectual differences remain. Shepard (36) reports that in the St. Louis, Missouri school area where extensive deprivation exists, a majority of the children from deprived homes fall into the lowest category when tested with the Iowa Tests of Basic Skills. In the Racine, Wisconsin "Pilot Kindergarten Project" four broad characteristics of the culturally deprived child were presented:

"Cultural deprivation was then defined as having its most noticeable effects on children in school along the dimensions of (1) underdeveloped expressive and receptive language skills; (2) a dimly perceived self-image; (3) minimal training in social skills, causing an inability to function effectively in a group; and (4) cultural differences which cause behavior and belief that may differ from those of the dominant group in the school. (22)"

Stendler (38) reports that the lower the socio-economic level, the less ambitious are the expectations of parents for their children. Crow (11) reports that the English spoken in these homes is not conducive to helping the children learn easily or well in school. Crow quotes Hunter as saying that low socio-economic level parents "--do not read much beyond the lowest level tabloid, if that. They do not know much about the world, or even the city and its problems and opportunities. They probably realize that education is important to getting ahead, but they do not see it as a real possibility for themselves or their kind. They do not provide a stimulus or encouragement for the child to benefit from his schooling." (11, p.42).

Furthermore, the deficits of the culturally deprived appear to be cumulative. Krugman (20) reviews various studies which deal with the effects of cultural deprivation. He claims that "...the deficit was seen to be cumulative, or increasing with time." Bloom states, in discussing Ausubel's article, that "The author suggests that possible irreversibilities in cognitive development may result from the 'cumulative nature of intellectual deficit.'" (6, p. 77)

A. B. Shaw reports that the "culturally disadvantaged" child has had meager school-like experiences and is often misunderstood by teachers and writers of textbooks. He comments that this disadvantage can be countered in part by nursery and kindergarten classes which are designed to broaden and enrich the child's experiences. (35) Deutsch (12) reports studies indicating that preschool and kindergarten experiences raise scores on group intelligence tests and that these increments are stable.

Another closely related approach to improving the educational experience of the culturally deprived has been to give teachers special training. It is suggested that a pupil's learning is largely a function of good teaching, and that specially trained teachers and improvements in the curriculum are very important. (14, 30, 40.)

One of the first to recognize the values of early training was Maria Montessori, who initiated a unique method of stimulating children through "education by self-activity." (37) The basic premise of the Montessori method is that a prepared environment will stimulate the children enough so that they will enjoy the learning process. This prepared environment is such that all materials lead to definite types of learning experience. These materials are called "didactic materials" and are designed to teach specific concepts and relationships such as size, space, and contour. (32,37). One example of these didactic materials is found in the manner in which the children learn to read. This is accomplished through tactual, auditory, and visual experiences such as tracing a sandpaper letter, hearing it pronounced, and seeing how it is formed. (32, 37) The purpose of this prepared environment is to augment the social as well as the familial situations which are non-stimulating to the child. This environment functions to help the child to help himself; she reports that the motivation comes from interest in doing the activity.(37) Standing says of the Montessori method "...the main purpose of the Montessori material--especially sensory material--is not so much to give the child new impressions as to give order to the impressions already received." (37, p.30) A study done at Ohio State University extends the idea of a prepared environment to each grade level and to each subject area. (15)

Piaget emphasizes early stimulation in asking the question, "For how could the four year old child think without having reference to objects having form and invariable dimensions, and how could he adapt his belief without a long preliminary development by the sensorimotor?" (31) Hebb (18) agrees with Piaget that lack of stimulation in early life has lasting detrimental effects. Lovell concludes his extensive studies on the growth of logical thinking in children with the following statement:

"It is our opinion that the cultural milieu, climate of opinion, of the general experience to which the person is subjected, is of the greatest importance in developing thinking skills." (23, p.151)

The Gestaltists state that a high degree of transfer may be expected if the individual is allowed to work out his own solutions to cognitive problems. They point out, "Thinking takes the form of a perceptual reorganization of the problem in a series of hierararchically related solutions which tend to become increasingly more specific." (10, p. 294-5)

Kersh (19) reports that learning by self discovery seems superior to learning through external direction in that it increases the students' motivation to continue in the learning situation. Bruner (7, 8) states that this form of self discovery in learning benefits the learner in four basic ways:

1. "increases the learner's ability to learn related materials,
2. fosters an interest in the activity itself rather than in the rewards which may follow the learning,
3. develops ability to approach problems in a way that will more likely lead to a solution,
4. tends to make material that is learned easier to retrieve or reconstruct."

In relation to the present study, it is reported by Riessman (33) that culturally deprived children learn better if they can manipulate the materials or learn on a more concrete basis. He also claims that these culturally deprived children are deficient in what he calls "school know how." This is one of the difficulties which hamper the child tremendously in the school system.

Kathryn Daniels stresses the importance of ego development in school programs designed to help the "educationally deprived" child. She points out that these children are raised under conditions of failure, poverty, and parental absense or neglect. It is up to the school under these conditions to present a



positive picture of satisfying rewards for the child as well as helping the child learn how to learn. (4)

Bringing the classroom to the home is an important aspect of a project to develop readiness. The Walking Teacher Project initiated in Rochester, New York, and the Learning Caravan in Syracuse, New York, are examples of projects which are attempting to reach out and involve the parents in the school's projects. Martin Deutsch suggests, "Though many parents will share in the larger value system of having high aspirations for their children, they are unaware of the operational steps required for the preparation of the child to use optimally the learning opportunities in the school." (29, p.168) Hanson (17) says that a good portion of the problem of educating these disadvantaged children is establishing and maintaining contacts with the parents. These parents often have made little, if any, endeavor to understand the school and the place their child holds in relation to the school. The Learning Caravan, mentioned above, stressed the importance of the child having a good start in school through helping the parents understand what the school is doing. (21)

In summary, the culturally deprived child lacks appropriate readiness experiences when he enters school and quickly develops educational deficiencies that interfere with or prevent his having a successful educational experience; any attempt to correct or prevent these deficiencies must begin early and consider not only the child but his teachers, his parents, and his environment.

#### Purpose

The basic purpose of this investigation was to explore ways of modifying the detrimental effects of cultural deprivation. These methods included a regular summer Head Start program and also certain additional techniques and procedures, and were intended to:

1. stimulate the child so that he wants to achieve;
2. allow the child to progress at his own rate, thus letting him achieve without external pressures;
3. give the child group experience to better prepare him to accept and handle the kindergarten situation;
4. give the child an opportunity, though proper direction, to overcome any negative feelings he may have had concerning the school situation;

5. teach (in two of the classrooms) specific concepts or relationships such as size, space, contour through the use of special Montessori toys;
6. provide individual parent contacts and conferences to one group in order to modify negative parental attitudes;
7. enhance the child's self-concept through these rewarding experiences.

### Hypotheses

The hypotheses tested were that greater degrees of involvement (i.e., noninvolvement, Head Start preschool program, Head Start plus Montessori toys, Head Start plus Montessori toys plus parent contacts) are related to greater degrees of improvement in the following characteristics of culturally deprived children:

1. mental maturity and readiness for academic learning, as measured by the Stanford-Binet Intelligence Scale and the Primary Mental Abilities Test;
2. success in kindergarten as measured by promotion

Although the original research proposal called for a fourth measure, social maturity using the Vineland Social Maturity Scale, this test was abandoned because the parents' reports turned out to be unreliable, and it would have been too time-consuming and costly to have observed each child long enough to correct the parents' misperceptions. (The tendency of these parents to exaggerate what their children could do may reflect differences in the way these parents perceive their children as compared with the standardization population for the Vineland Social Maturity Scale.)

## Chapter 2

### METHOD

The general design of this study was to determine changes in academic readiness of culturally deprived children enrolled in special preschool programs, by means of pre- and post tests and by a comparison of success in kindergarten of the experimental groups with control groups and with pupils in previous years.

#### Population and Sample

The City of Duluth was funded for Head Start training for the summer of 1965, and the selection of children to participate in this special project was made from the total population eligible for Head Start training. The criterion of eligibility for project Head Start was an annual family income of \$3,000 or less. From the total population of approximately 200 children, 75 were selected for the special project. These 75 children lived in three elementary school areas serving the lowest income groups in the city, and three experimental groups were formed, one from each school area. In each school, 14 to 17 children were selected to participate in the project. Approximately 30 children from the same three areas were selected for the control group; these 30 children did not participate in any type of preschool program.

#### Procedures and Statistical Treatment

At each of the three schools, a different preschool treatment program was administered in conjunction with Project Head Start, and carried out by teachers trained for Head Start. One group, located at Lincoln Elementary School, received no special classroom experiences beyond the regular Head Start Program curriculum. The second group, located at Nettleton Elementary School, was given special creative Montessori play equipment in addition to the regular Head Start program. The teacher was informed as to the goals and procedures of the Project, as described in the research proposal (S-195-65), and methods of reaching these goals were discussed. The third group, located at Franklin Elementary School, was given identical toys, equipment, and experiences, and in addition, the parents of this group were involved in a parent visitation program under the direction of a parent coordinator. The parent coordinator contacted all of these parents at least three times during the summer program. A further contact was made at the end of the program and prior



to the first day of kindergarten. Still another contact was made with the parents over the Christmas holidays. These contacts included helping the parents realize such things as the value a proper education has for their children, the influence of the home and community environment upon the child, proper physical and mental hygiene for the child, and helping them to better understand ways of supporting their child's efforts to succeed in school. The parent coordinator also offered to help parents to interpret their children's progress or lack of progress in the preschool program. The parents also were invited to observe their children in the classroom situation and were given proper explanations as to classroom procedures.

The Lincoln group was given no further supervision than the regular Head Start Program. The Franklin and Nettleton groups, however, were given a more specific program and more intensive observation as well as supervision. The Franklin and Nettleton groups were encouraged to provide experiences which would help develop and coordinate large muscles through such activities as running, climbing, jumping, balancing, as well as other activities involving the whole body. The Montessori toys given to these two groups are designed to help the child acquire self-confidence through control over small muscles. This is accomplished through the manipulation of blocks, cutting and pasting, using crayons, painting, working with clay, building in the sand, and other activities. More specifically, these toys are designed to teach specific concepts and relationships such as size, space, and contour (37). The children learned care of belongings, habits of personal cleanliness, and the value of regular eating and sleeping habits. The teachers were instructed to allow the children to work at their own pace and in their own manner in an attempt to allow them to participate in activities that would bring them pleasure as well as satisfaction. An attempt was made to develop skills of expression and verbal communication. This took the form of conversations with the teacher, psychometrists, the other children, and with any other adult who happened to enter the room. To compensate for the varied developmental levels of the children as well as for their other individual differences, different forms of play as well as the more structured activities were allowed in the classroom. The less mature children who may have preferred more solitary play were allowed certain times of the day when they could play alone. The more mature children who preferred the group activities were given sufficient opportunity to participate in such activities. The children were also given sufficient opportunity to play as well as work in both small and large group situations. These were usually guided by the teacher. Although unstructured activities were stressed, more formal activities were also utilized. Story-telling, general conversation, learning

songs, prereading experiences, musical and rhythmic play as well as problem solving groups, were part of the more formal activities.

The tests which were used in an attempt to determine academic readiness were the Stanford-Binet Intelligence Scale, Form L-M, 1960 revision, and the SRA Primary Mental Abilities Test, for ages 5-7.

The first two sub-tests of the Primary Mental Abilities Test were used, the Verbal-Meaning (V) test and the Perception (P) test. The verbal-meaning test is one of the abilities which Thurstone and Thurstone report is a measure or factor of "intelligence." "Young children high in V should, barring physical or emotional handicaps, learn to read easily, to communicate their ideas well, and to comprehend oral directions." (41) The second sub-test, Perception, (P), is designed to measure the child's ability to recognize likenesses and differences between pictorially presented objects and symbols.

The initial testing was completed the first week of July, 1965, one week prior to the beginning of the Head Start Program. A second testing was completed in September, 1965, after the conclusion of the Head Start Program and approximately one week prior to the beginning of the regular kindergarten class. The third testing was completed in June of 1966 at the completion of the regular kindergarten school year.

Personal and family information on the children used in this study was obtained through the Duluth Board of Education. The Board of Education also supplied the classrooms, supplies, and basic equipment used for this study at the various schools.

Analysis of variance was used in testing the research hypotheses. Two factors were examined: (a) treatment groups, and (b) successive administrations of a test. Both of the factors were defined as fixed effects. The subjects constituted a third dimension which was treated as a random effect.

The first hypothesis tested was that involvement in preschool training, as contrasted with non-involvement, is related to improvement in the following characteristics of culturally deprived children:

- a. academic potential as measured by the Stanford-Binet;
- b. academic achievement as measured by the PMA;
- c. school success as measured by promotion-nonpromotion

The second hypothesis tested was that the kind of treatment of children in preschool training is related to the amount of improvement in the following characteristics:

- a. academic potential as measured by the Stanford-Binet;
- b. academic achievement as measured by the PMA;
- c. school success as measured by promotion-nonpromotion

## Chapter 3

### RESULTS

In the analysis of the data collected for this study, academic potential as measured by the Stanford-Binet, academic achievement as measured by the Primary Mental Abilities test, and school success as measured by promotion-nonpromotion were treated as dependent variables. It was assumed that changes in these variables would be effected by programs such as are described in this study.

#### First Hypothesis

The first hypothesis tested was that involvement in preschool training, as contrasted with noninvolvement, is related to improvement in the following characteristics of culturally deprived children:

- a. academic potential as measured by the Stanford-Binet;
- b. academic achievement as measured by the PMA Verbal test;
- c. academic achievement as measured by the PMA Perceptual test;
- d. school success as measured by promotion-nonpromotion.

#### Test of Hypothesis I,A

In Table 1 are shown the results of the test of the statistical hypothesis that there is no difference in the rate of improvement of academic potential in the experimental and control groups.

TABLE 1

Analysis of Variance of Academic Potential of Children  
Classified as Experimental and Control for Three  
Administrations of the Stanford-Binet Test.

Source of Variance	F	p(probability)
Groups (E and C)	1.38	N.S.
Administrations (1, 2, 3)	8.44	.01
Interaction, groups	5.42	.01

The hypothesis is rejected at the .01 level; the groups differ in the amount of improvement in academic potential as indicated by the interaction. Further clarification of the results is provided in Figure 1 and in Table 1,A. showing the t-tests between groups and administrations.

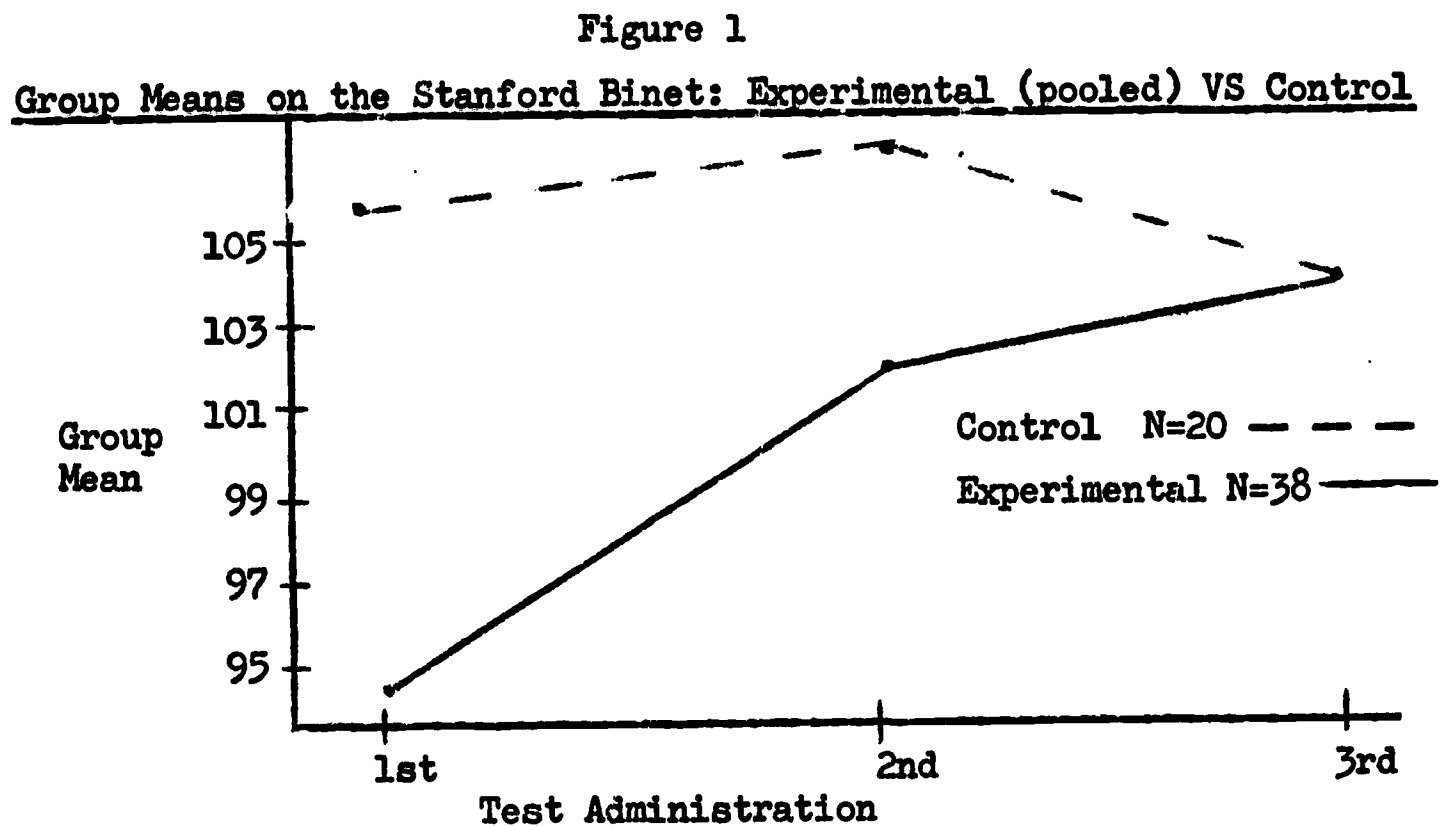


TABLE 1,A

Summary of t-tests of Academic Potential for E and C groups,  
three Administrations

	Adm. <sub>1</sub>	t-tests, A <sub>1</sub> and A <sub>2</sub>	Adm. <sub>2</sub> <sup>1</sup>	t-tests, A <sub>2</sub> and A <sub>3</sub>	Adm. <sub>3</sub>
Exp.	M=95	N=42 t=3.98 p=.01	M=101 M=101	N=38 t=2.10 p=.05	M=104
t-test E vs. C		t=2.61 p=.01	t=1.35 n.s.		t=.01 n.s.
Con	M=105	N=25 t=.72 n.s.	M=107 M=106	N=20 t=.94 n.s.	M=104

<sup>1</sup> Some children left the community, so that the N for 2nd and 3rd administrations is slightly smaller and there may be two means shown for the "second administration." It should be noted that it was necessary to use the reduced number when carrying out the Analysis of Variance.



The figures in Table 1,A indicate that the experimental group gained significantly between the first and second, second and third, and first and third administrations while the control group showed no significant change.

#### Test of Hypothesis I,B

Table 2 shows the results of the test of the statistical hypothesis that there is no difference between the academic achievement of the experimental and control groups as measured by the PMA-Verbal test.

TABLE 2

Analysis of Variance of Academic Achievement of Children Classified as Experimental and Control for Three Administrations of the PMA-V Test

Source of Variance	F	p
Groups (E and C)	.26	n.s.
Administration (1, 2, 3)	124.69	.001
Interaction (Grps. & Admin.)	3.74	.05

The hypothesis remains in doubt. The interaction term suggests (at the .05 level) a relationship between group and amount gained. A significant gain by both groups between administrations is also indicated. Further clarification of these results is provided in Figure 2 and Table 2,A.

Figure 2

#### Group Means on the PMA-V: Experimental (pooled) VS Control

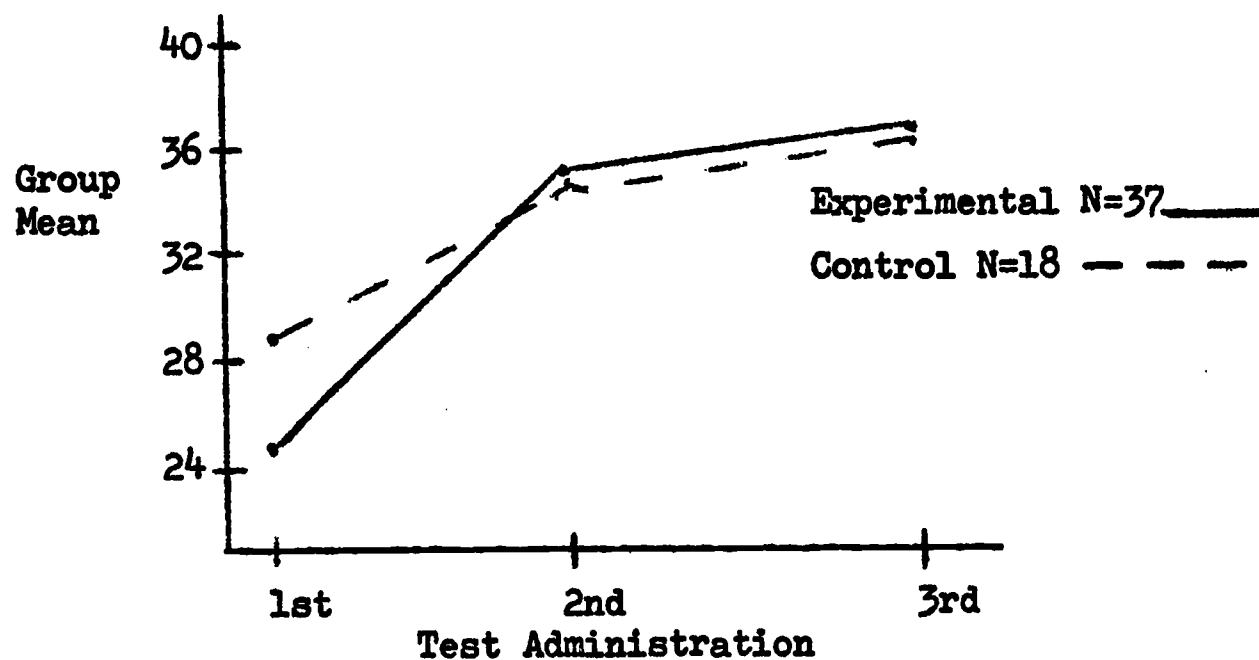


TABLE 2,A

Summary of t-tests of Academic Achievement for E and C groups,  
Three Administrations, of the PMA Verbal Test

	Adm. 1	t-tests, A <sub>1</sub> and A <sub>2</sub>	Adm. 2	t-test A <sub>2</sub> and A <sub>3</sub>	Adm. 3
Exp.	M=25.026	N=38 t=9.923	M=34.815 M=34.36	N=38 t=5.790 p=.01	M=37.97
t-test E vs. C		t=.975 p=n.s.	t=.299 p=n.s.		t=.195 p=n.s.
Con	M=27.291	N=24 t=6.158 p=.01	M=34.666 M=34.789	N=19 t=3.025 p=.01	M=38.368

As is shown in Table 2,A both groups gained significantly between all administrations: When these results are shown graphically in Figure 2, they suggest that the experimental group gained more than the control group between the first and second administrations.

#### Test of Hypothesis I,C

Table 3 shows the results of the test of the statistical hypothesis that there is no difference between the academic achievement of the experimental and control groups as measured by the PMA-Perceptual Test.

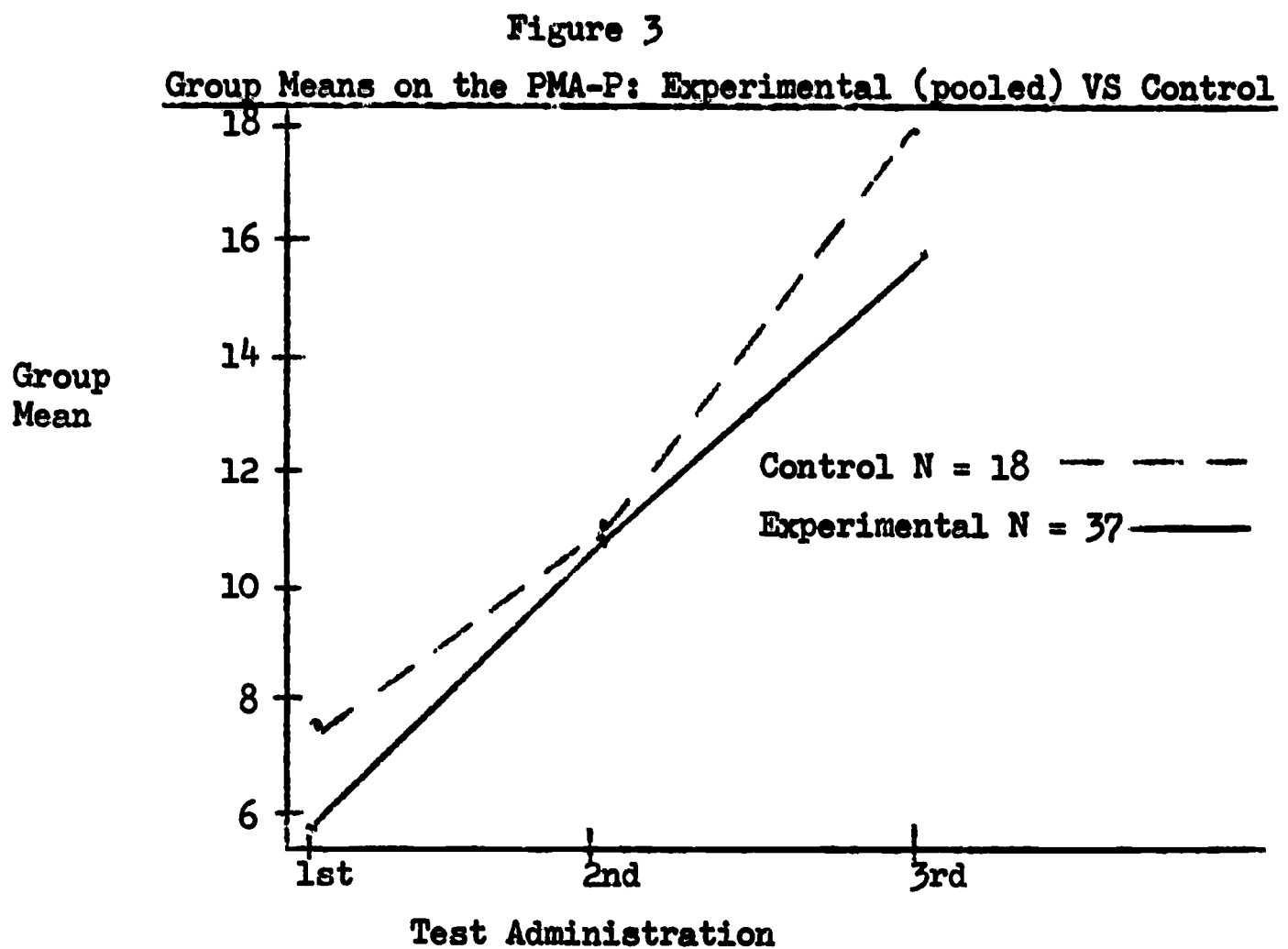
TABLE 3

Analysis of Variance of Academic Achievement of Children classified as Experimental and Control for Three Administrations of the PMA-P Test.

Source of Variance	F	p
Groups (E and C)	.76	n.s.
Administration	74.25	.001
Interaction (Grps. and Admin.)	.61	n.s.

The hypothesis is accepted; the test provides no evidence of differences in achievement. The test also indicates that both groups gained significantly between administrations. In Figure 3 and Table 3,A further clarification of these results is provided.





**TABLE 3,A**

Summary of t-tests of Academic Achievement for E and C groups,  
Three Administrations, of the PMA Perceptual Test.

	Adm. 1	t-test, A <sub>1</sub> and A <sub>2</sub>	Adm. 2	t-test, A <sub>2</sub> and A <sub>3</sub>	Adm. 3
Exp.	M=52	N=38 t=5.092 p=.01	M=10.315 M=10.289	N=38 t=5.213 p=.01	M=15.657
t-test E vs. C		t=1.596 p=n.s.	t=.418 p=n.s.		t=.958 p=n.s.
Con	M=7.916	N=24 t=2.465 p=.01	M=10.666 M=11.052	N=19 t=4.611 p=.01	M=18.052

As is shown in Figure 3 and Table 3A the groups did not differ between them, but both groups gained significantly between test administrations.

### Test of Hypothesis I,D

In the three schools in which this study was carried out, all but nine children were promoted from kindergarten to the first grade, and four of the nine were not involved in the study. Four children from the experimental groups and one from the control group were not promoted, as shown in Table 3,B.

TABLE 3,B  
Number of Pupils Promoted and Not Promoted in the  
Experimental and Control Groups

	Experimental	Control	Total
Promoted	34	18	52
Not Promoted	4	1	5
Total	38	19	57

Even applying Yates' correction to the chi-square test, the one small cell frequently raises some doubt as to the probability estimate, but the very small obtained chi-square (0.03) leaves no alternative but to accept the hypothesis that involvement in preschool training was not related to school success as measured by promotion-nonpromotion.

### Second Hypothesis

The second hypothesis tested was that the kind of treatment of children in preschool training is related to the amount of improvement in the following characteristics:

- a. academic potential as measured by the Stanford-Binet
- b. academic achievement as measured by the PMA Verbal test
- c. academic achievement as measured by the PMA Perceptual test
- d. school success as measured by promotion-nonpromotion

### Test of Hypothesis II,A

Tables 4A and 4B show the results of the test of the statistical hypothesis that there are no differences in improvement in the academic potential of the three experimental groups.

TABLE 4A

Analysis of Variance of Academic Potential of Children Classified by Three Experimental Treatment Methods for Two Administrations of the Stanford-Binet (beginning and end of treatment)

Source V	F	p
Treatment groups	3.68	.05
Administrations (1st,2nd)	15.72	.01
Interaction	.24	n.s.

TABLE 4B

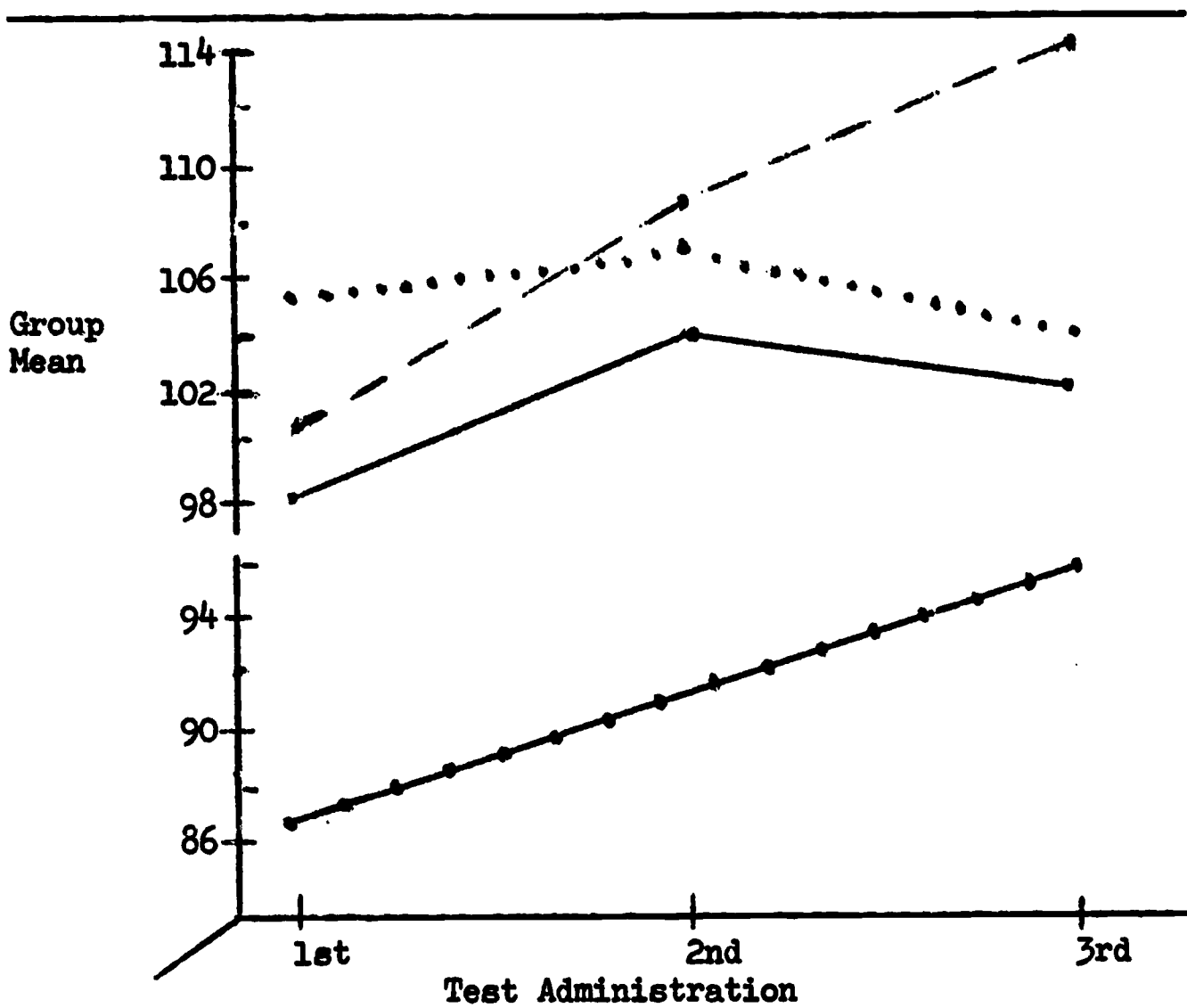
Analysis of Variance of Academic Potential of Children Classified by Three Experimental Treatment Methods for Two Administrations of the Stanford-Binet (end of treatment, end of following school year)

Source V	F	p
Treatment groups	4.33	.025
Administrations (2nd,3rd)	4.49	.05
Interaction	2.19	n.s.

The hypothesis is accepted; the test provides no evidence of differences in the amount of improvement in academic potential among treatment groups. The test further indicates that the groups differ in potential and that all groups gained significantly over time. In Figure 4 is provided further illustration of these findings.

Figure 4

Group Means on the Binet for Franklin, Lincoln, Nettleton Schools and controls for the three testings.



Franklin	N = 13	—————
Lincoln	N = 12	- - - - -
Nettleton	N = 13	.....
Control	.....(not included in the test)	

### Test of Hypothesis II,B

Tables 5A and 5B show the results of the test of the statistical hypothesis that there are no differences in the academic achievement of the three experimental groups as measured by the PMA Verbal test.

TABLE 5,A

Analysis of Variance of Academic Achievement of Children Classified by Three Experimental Treatment Methods for Two Administrations of the PMA-V (beginning and end of treatment)

Source of Variance	F	p
Treatment groups	5.17	.025
Administrations (1st and 2nd)	121.08	.001
Interaction	5.10	.025

TABLE 5,B

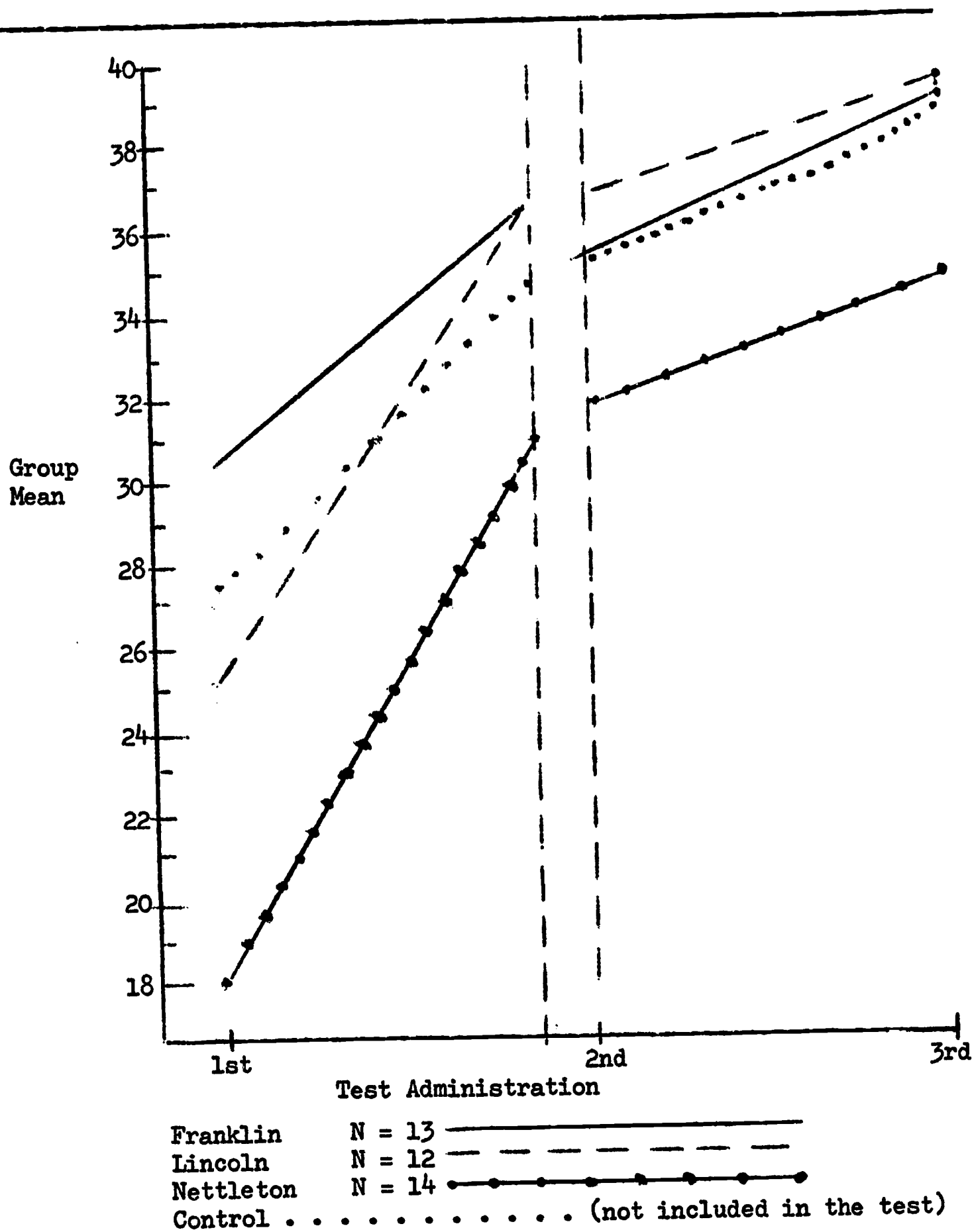
Analysis of Variance of Academic Achievement of Children Classified by Three Experimental Treatment Methods for Two Administrations of the PMA-V (end of treatment, end of following year)

Source of Variance	F	p
Treatment groups	1.82	n.s.
Administrations (2nd and 3rd)	33.58	.001
Interaction	.22	n.s.

For the treatment period (1st and 2nd administrations) the hypothesis remains in doubt (.025); there appear to be differences in academic achievement. For the period following (2nd and 3rd administrations) the hypothesis is accepted; the test shows no differences in achievement. The test indicates significant gains by all treatment groups. Figure 5 illustrates the pattern of gains, and shows the least gain by the Franklin group during the treatment period.

Figure 5

Group Means on the PMA-V for Franklin, Lincoln, Nettleton and Controls



### Test of Hypothesis II,C

Tables 6A and 6B show the results of the test of the statistical hypothesis that there are no differences in the academic achievement of the three experimental groups as measured by the PMA-Perception test.

TABLE 6,A

Analysis of Variance of Academic Achievement of Children Classified by Three Experimental Treatment Methods for Two Administrations of the PMA-P (beginning and end of treatment)

Source of Variance	F	p
Treatment groups	2.51	n.s.
Administrations (1st and 2nd)	26.05	.001
Interaction	.55	n.s.

TABLE 6,B

Analysis of Variance of Academic Achievement of Children Classified by Three Experimental Treatment Methods for Two Administrations of the PMA-P (end of treatment and following year)

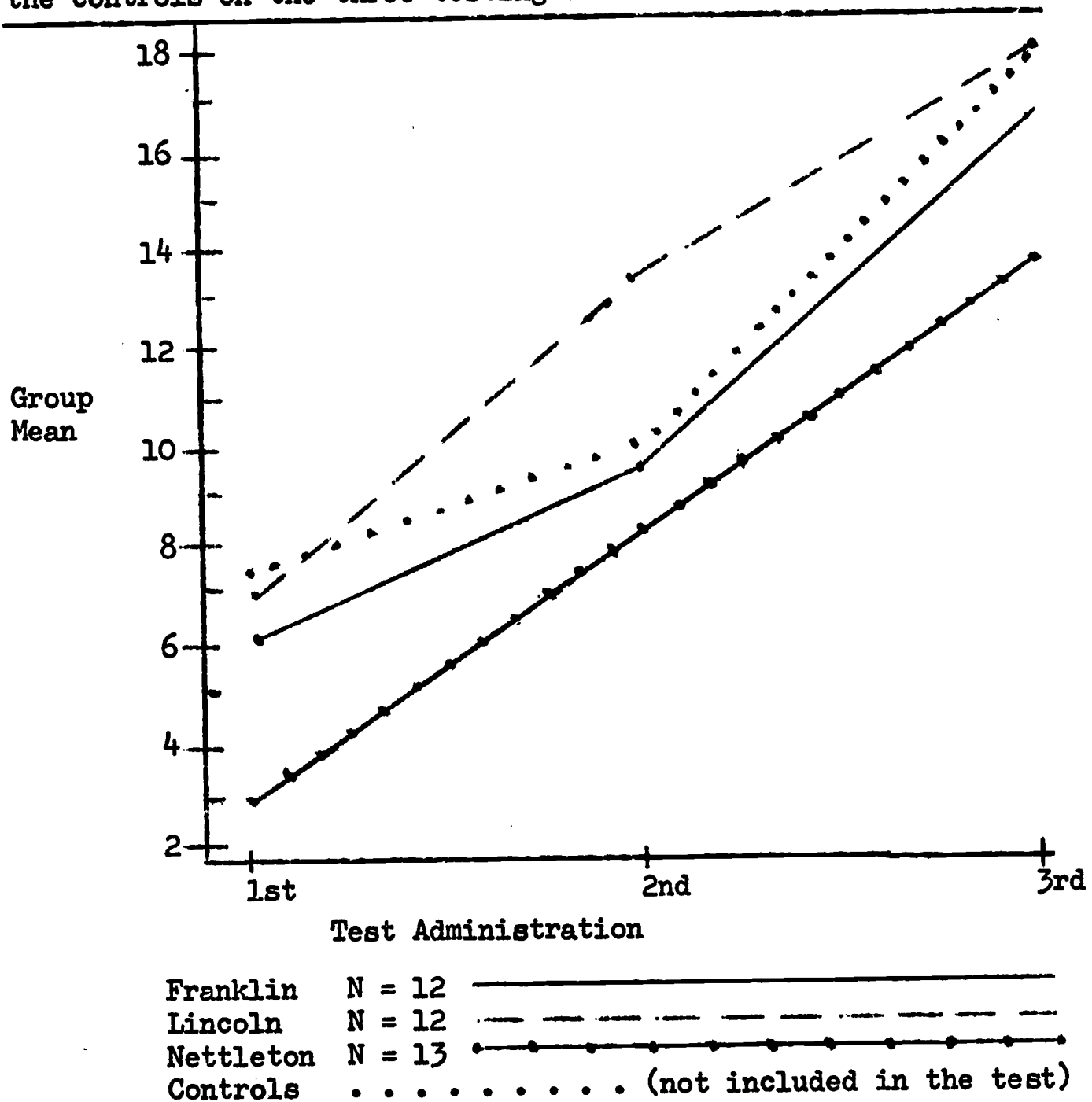
Sources of Variance	F	p
Treatment groups	1.87	n.s.
Administrations (2nd and 3rd)	28.44	.001
Interaction	.25	n.s.

The hypothesis is accepted; the tables show no difference in achievement among the three groups. All groups showed significant gains. Figure 6 illustrates the pattern of gains.



Figure 6

Group Means on the PMA-P for Franklin, Lincoln, Nettleton, and the controls on the three testings.



#### Hypothesis II,D

The hypothesis that the kind of treatment was differentially related to school success as shown by promotion-nonpromotion was not supported. With only four experimental students failing, no pattern related to treatment could be ascertained.

## Chapter 4

### DISCUSSION

The most clearcut positive finding of this study was the support given to the hypothesis that academic potential (as measured by the Stanford-Binet test) can be increased by preschool training programs of the kinds described in this study. While the average IQ of the control group remained constant through the three testings, as would be expected, the mean IQ of the experimental groups increased significantly (six points during the eight-week Head Start program and three more points during the following academic year in which the children were enrolled in kindergarten).

From these results it appears that not only is the gain which occurs in preschool training stable, but that it provides a basis for further gains in later school training. There is no evidence of similar gains by the control group.

In the initial testing, the mean IQ of the control group was significantly higher than that of the experimental groups. By the time this research proposal was approved and funded, the City of Duluth had obtained a grant for Project Head Start. In keeping with the socially admirable intent of that project, as many eligible children as possible were enrolled. As so frequently happens in similar circumstances, the activities with the more immediate and apparent social utility took precedence over research activities, so that instead of randomly assigning eligible children, it became necessary to seek controls from as nearly similar socioeconomic circumstances as was possible. However, both groups were within approximately one standard error of measurement of the national mean score.

It may be that the preschool programs increased these children's ability to function in the social milieu of the classroom, increased their social maturity, their self-confidence, their confidence in relationships to adults, their test-taking attitudes, or certain skills. Whatever the underlying factors may be, the fact remains that the preschool experiences did significantly raise their scores on an instrument that predicts academic success, and that these scores continued to rise during the following year. Thus, one may predict with greater confidence that these children will continue to have success in school. Conversely, the scores of the children without preschool training did not increase during the following year. Had these scores been initially as low as those of the experimental group, results similar to these would have shown an increasing, cumulative deficit in academic potential. The results

here indicate that even a rather brief preschool experience of the Head Start type may reduce and probably reverse this trend.

The findings with respect to the Verbal subtest of the Primary Mental Abilities Test are not as clearcut. Both groups showed substantial and significant gains, with the experimental group gaining more (at the .05 level) than the controls. As is shown in Table 2, the controls were again initially higher and the difference in gains occurred during the Head Start period, with no differential increase during the following year. This test is a paper and pencil test involving the identification of objects, activities similar to those taught in regular kindergarten classes. The results suggest that preschool training of the Head Start type provides initially disadvantaged groups an opportunity to catch up with more average groups, and that this equality is maintained when the two are provided similar classroom experiences. No further advantage appears to accrue during the following year; it would appear that the initially more average group is able to make up during this year for the lack of preschool experience. Nevertheless, the value of preschool experience for the disadvantaged is again demonstrated.

The findings with respect to the Perceptual subtest of the Primary Mental Abilities Test indicate that both groups gained significantly between the first and second and the second and third testings, but that there is no difference in the amount of gain, and no difference between the two groups at any point.<sup>1</sup> This test requires the child to recognize differences and likenesses among pictorially presented materials. It seems evident that improvement in the skills measured by this test is more a function of the passage of time than of the experiences provided in the Head Start program. The assumption underlying the use of this test to measure academic achievement was that exposure to enriching sensory experiences, and particularly to the Montessori-type of didactic materials for teaching concepts relating to space, dimension, contour, size, and the like, should be reflected in greater ability to recognize pictorial objects. The negative results may be due to lack of sensitivity in the test, but they may also indicate that cultural deprivation as defined for Head Start purposes does not handicap children in perceptual areas in the same manner that it does in the verbal areas.

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<sup>1</sup> Figure 3 shows an apparent difference, with the control group having a higher mean score; however, as is indicated in Table 3,A, the differences could be due to sampling errors.

The final hypothesis in this subsection was that involvement in preschool training would result in better school success as indicated by promotions. The small number of nonpromotions is a limiting factor in the interpretation of chi-square, but it is evident that no meaningful difference existed. Identification of the nonpromoted children indicates that two of the experimental children not promoted had measured IQ's below 70 and the other two below 80, while the one control had a measured IQ below 80. It seems evident that the brief preschool training was not sufficient to overcome the very low initial ability of these children. In the previous year, 16 children had been retained in kindergarten in the schools included in the study, while only nine were retained in the year following Head Start. It appears probable that the advent of Head Start, as well as the greater national focus on the problems of disadvantaged, may have created greater teacher awareness and sensitivity to the needs of these children and resulted in changes in promotional practices. While this change, if it occurred, is probably a very real plus factor, it does tend to invalidate promotion-nonpromotion as a measure of the success of Head Start.

In addition to comparing experimental and control groups, further hypotheses were tested concerning the differential effects of different kinds of preschool programs. The differences in these programs (Franklin, Nettleton, Lincoln) were described earlier.

All of the analysis of variance tables from 4A through 6B may be summarized by saying that no evidence was found of any difference in the effects of the three programs that could not be accounted for by chance factors. The tests further indicate that all three groups gained significantly on all three measures during the preschool training period and again during the ensuing school year.<sup>1</sup> Further, the tests indicate that there were differences among the three groups in academic potential as measured by the Stanford-Binet, and also in academic achievement as measured by the PMA-Verbal test. The latter differences disappeared after the preschool training, however. Figures 4, 5, and 6 illustrate the means used in the analysis of variance. The control group means are also shown for illustrative purposes only; they were not included in these analyses.

Again, the practical consideration of placing the eligible children into the school nearest their homes made it impossible

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<sup>1</sup> The gain in IQ during the following academic year is least certain, since the beginning to end difference is significant only at the .05 level.



to select matched groups for each of the three treatments. However, there is no evidence that the initial differences in test scores made a difference during treatment, since there is no tendency for either the initially highest nor the initially lowest groups to gain more or less than the other groups.

There are many possible explanations of the lack of differential effects despite the differences in treatment. The most obvious and parsimonious, probably, is that the addition of Montessori-type toys and home visits does not, in fact, add any significant dimension to the enriching experiences offered in a good Head Start program. There are, however, other factors that need to be considered. One is the fact that differences did exist among the children, differences that may have countered the influences of the special treatments. Another is that there was easy opportunity for communication among the teachers, and the possibility that suggestions as to methods and techniques furnished to two of the teachers may have been picked up by the third. The possibility of different teaching effectiveness, or effectiveness in relationships with young children among the different teachers and their aides cannot be overlooked. Different measuring instruments might have revealed differences that were not picked up by the instruments used. It is also possible that more time is needed to permit differences to show up, particularly if the home visits did in fact have any effect on parental attitudes and behavior. Whatever factors were at work, the conclusion from this study must be that the Montessori materials and methods approach and the home visits did not appear to add to the value of the regular Head Start program.

With only four experimental pupils failing and at least one of them coming from each of the three schools, promotion-non-promotion is of course of no value as a criterion of differential success, at least at the kindergarten level.

## Chapter 5

### CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS

A proposal for a pilot study of enriched preschool training for culturally disadvantaged children was proposed to the U.S. Office of Education before the inception of the Head Start program. However, the proposal was funded after Duluth had been approved for Head Start and had begun the selection of children. As a result, the pilot study was modified and adapted as well as possible to the Head Start program already being planned, with some accompanying loss of freedom and control in the selection of children to participate and to serve as controls.

The results of the study, as reported above, suggest the following conclusions:

1. the Head Start program and similar preschool experiences, even when provided for a limited period of time as was the case here, do significantly increase the academic potential of culturally disadvantaged children, as measured by the Stanford-Binet test;
2. the advantage gained is not only retained but appears to provide a basis for further gains in the kindergarten year;
3. the question as to whether such programs significantly affect academic achievement as measured by the PMA-Verbal test remains in doubt, and there is no evidence to indicate special value in such programs for achievement in a non-verbal area as measured by the PMA-Perceptual test;
4. no evidence was found to indicate that the addition of Montessori materials and home visits to a good Head Start program increases the advantage that accrues to children in such programs, at least when the programs are of short duration and the children are followed up for only one year.

#### Implications

Considering the fact that the Stanford-Binet is probably the most accurate predictor of academic success available today, the clear implication of the findings of this study is that Head Start or similar preschool programs should be continued and extended for the culturally disadvantaged.

Another implication, not nearly as clearcut, but still implied by the results, is that children who are "culturally disadvantaged" as currently defined are disadvantaged in verbal areas but not necessarily as much disadvantaged, if at all, in nonverbal perceptual functions such as those measured in the study.

The apparent implications of the lack of differential gains from exposure to Montessori materials and home visits need to be considered very cautiously.

The basic assumption underlying the use of Montessori materials, that intensive and extensive sensorimotor stimulation at an early age is essential to full development, has received support from studies by Piaget, Hebb, and others cited earlier. In light of this fact, several explanations of the negative results suggest themselves. Perhaps the training period was too short to effect significant changes. Perhaps changes occurred but will not show up in measurable form until later. Perhaps the measuring instruments were not sensitive to such changes. It also seems possible that the materials were not strongly stressed or used by the teachers who were, after all, trained to carry out standard Head Start procedures and possibly viewed the use of these materials as somewhat peripheral to the task for which they were being paid, despite the instructions provided them. Another hypothesis is that the kinds of sensorimotor experiences provided by these materials are not experiences in which these children are handicapped, and hence that the additional experience did not really give them an advantage over the controls. Middle-class children's activities are often circumscribed, supervised, and restricted by cautious parents, while these children tend to be free to roam and explore with little supervision or restriction.

Considering all of these possibilities, it seems imprudent to infer from the negative results that these materials are not, in fact, of educational value.

With respect to home visits, the situation is somewhat different. The evidence indicates that parental attitudes of culturally disadvantaged children do contribute to their lack of success; therefore, changes in parental attitudes should be of value. The most likely explanations of the negative results appear to be that there was not enough time to affect deeply ingrained attitudes, that the effects of attitude change will not show up so soon, that the measuring instruments were inadequate, or that the worker simply was not effective in his attempts to change attitudes. The most obvious implication is that more research is needed in this area.



## Recommendations

An obvious recommendation is that this study be replicated, using larger numbers of children, longer periods of training, and more precise controls. The basic value of Head Start programs has by now been well established by reports across the nation, and the pressure will be great to use all available funds to get on with the task, to reach as many children as possible, rather than deliberately depriving some children of an experience that has proved to be of value. Difficult though it is to resist pressures resulting from such kind and humane motives, they must be resisted if the programs to which we are now committing vast amounts of money and effort are to be really maximally effective. It is clear even from this small pilot study that very much more needs to be known about the relative effectiveness of various approaches, and that simply going ahead and doing what seems theoretically good will never provide us with the needed information.

Two lines of evidence from this study suggest that while the culturally disadvantaged child may be seriously disadvantaged in the verbal area, he may be less disadvantaged, if not even "advantaged" in certain kinds of sensorimotor development. The first bit of evidence is that no differences were found between experimentals and controls in perceptual development; the second is that the Montessori materials did not seem to add to the value of the preschool training. While these findings are indeed tenuous, they do lead to the recommendation that the hypothesis advanced here be examined carefully, using a study in which both culturally deprived children and children not so deprived be used both as controls and experimental subjects, in training programs where one group receives primarily verbal training and another primarily training to develop the sensorimotor.

It is recommended that special preliminary studies be made to locate and, as necessary, develop appropriate sensitive instruments to measure the changes that the programs are intended to bring about.

It is recommended that the children in such studies be followed through school with ongoing measurements to assess changes as they mature.

Finally, there is enough evidence available now as to the importance of the personality, the warmth, openness, flexibility and accepting nature of the teacher as an important variable in early childhood relationships to prompt the recommendation that particular attention be paid to the selection of teachers used in such studies.

## Chapter 6

### SUMMARY

It is well-known that children from economically and culturally disadvantaged homes often experience serious difficulty in adjusting to and benefiting from their educational experiences, that these children frequently are retained one or more grades and drop out of school before completing their high school education, and that they may later have serious difficulties in attaining their maximum potential and becoming contributing members of society. In recent years, the costs of such educational failure have been recognized and massive preventive and remedial measures have been undertaken.

There is a growing body of research literature pointing to the lack of environmental and parental stimulation as prime factors in these children's lack of success in school and later life. The lack of verbal skills and readiness resulting from a culturally disadvantaged environment are perhaps most often mentioned, but the lack of other kinds of sensorimotor experiences relevant to learning is also frequently mentioned, as is the indifferent or even hostile attitude of parents toward formal schooling, and their defeatist attitude regarding the value of education as a step toward success in life.

It was the principal objective of this study to explore ways of extending the limits of academic potential and achievement set by the restrictive backgrounds of culturally deprived children. The subjects were four-year-old children eligible for and enrolled in Project Head Start in three Duluth schools in the lowest socioeconomic area of the city, schools which typically have had disproportionately large numbers of children retained in kindergarten and first grade.

Three different types of presumably enriching experiences were provided. All three schools carried out all regular Project Head Start activities. Two of the schools were provided, in addition, a supply of Montessori toys and materials and the teachers instructed in their use for the provision of stimulating sensorimotor experiences. In one of the latter two schools parent visits and parent counseling were provided as an additional factor. This counseling program, intended to aid parents to encourage and support their children's educational efforts and to change attitudes, was carried out by a former social worker and settlement house director from Appalachia. Thus, three levels of intensity of preschool training were used. A control group of children from the same geographic area was selected and measurements taken equivalent to those made on the experimental groups.

The measuring instruments were the Stanford-Binet as a measure of academic potential, and two subtests, Verbal and Perceptual, of the Primary Mental Abilities test, as measures of academic achievement. A further measure of academic achievement was promotion-nonpromotion at the end of the kindergarten year. The tests were administered at the start of the eight week Head Start program, at the end of the program, and at the end of the following (kindergarten) year. The Vineland Social Maturity Scale was also given but the results proved too unreliable to be used.

The first hypothesis tested was that involvement in pre-school training, as contrasted with noninvolvement, is related to improvement in academic potential and achievement as measured. The Stanford-Binet test showed that the preschool training groups gained significantly in academic potential during the training period, and continued to gain the following school year, while the control group remained unchanged. Both groups gained significantly on the Verbal test, with the preschool groups showing larger gains (at the .05 level) than the control group during the preschool training period. Both groups gained significantly on the Perceptual test, with no difference in the amount of gain. There were no significant differences in the proportion of promotions in the two groups: The total number of nonpromotions in kindergarten in the three schools involved dropped sharply from previous years.

The second hypothesis tested was that the level of involvement in preschool training (Head Start, Head Start plus Montessori toys, these two plus home counseling) is related to the amount of improvement in academic potential and achievement as measured. No significant differences in improvement were found on the tests or in promotions.

One of the limitations of this study was the lack of initial equivalence among the groups of children. By the time this study was funded, the City of Duluth was preparing to launch its first summer Head Start program, into which were placed as many as possible of all eligible children in each neighborhood. As a result, the three experimental groups had to be accepted as intact neighborhood groups. Further, it was impossible to locate really equivalent controls in these neighborhoods. While the differences did not appear to invalidate the positive results of the study, it is believed that initial equivalence might have revealed effects in areas where none were found.

Considering that the Stanford-Binet test is probably as good a predictor of academic success as we have available, the results indicate that not only is there very real value in Head Start-type preschool programs for the culturally deprived, but that this experience appears to make possible further gains during the ensuing school year. Another implication is that the gains are largely verbal, and that either the measures used in this study were inadequate to detect sensorimotor gains or that children from low socio-economic levels do not, in fact, incur deficits in other sensorimotor areas equivalent to those incurred in verbal areas. This hypothesis is suggested not only by the lack of differential gain in the perceptual test but also by the seeming lack of value of the sense-and-muscle-oriented Montessori materials. While this is a tentative suggestion indeed, there is a need to carry out further studies to test the hypothesis of differential disadvantage.

It is also recommended that further research be conducted on the question of the effectiveness of trying to modify parental attitudes. The negative results from this study may well be due to the limited time given for modifying life-long attitudes, the limited time in which changed attitudes could manifest themselves, or ineffective techniques for changing attitudes.

In summary, this study presents evidence of the value of pre-school training of the Head Start type for culturally disadvantaged children, but does not provide evidence of the value of special techniques for sensorimotor experiences using Montessori materials, or of home visits to change parental attitudes. More research in these areas is needed.



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