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EVALUATION OF HEADSTART EDUCATIONAL PROGRAM IN CAMBRIDGE, MASSACHUSETTS. FINAL REPORT.

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BEGINNING WITH A REVIEW OF THE NURSERY SCHOOL MOVEMENT (FROEBEL, MONTESSORI, AND MCMILLAN,) THIS EVALUATION RELATES THE HISTORICAL MATERIAL TO HEAD START, SPECIFICALLY IN CAMBRIDGE MASS. DURING THE SUMMER OF 1965, MATCHED GROUPS OF 33 HEAD START CHILDREN AND 33 NON-HEAD START CHILDREN (CONTROL GROUP) WERE STUDIED. SCHOOL PRE-REGISTRATION LISTS PROVIDED NAMES AND SOCIO-ECONOMIC INFORMATION FOR BOTH THE HEAD START CHILDREN AND THE CONTROL GROUP CHILDREN. BOTH GROUPS WERE TESTED DURING THE TWO WEEKS BETWEEN THE CLOSE OF HEAD START SESSIONS AND THE FIRST DAY OF PUBLIC SCHOOL. SCORES ON MEASUREMENT INSTRUMENTS WERE ANALYZED ON THE BASIS OF (1) SEX, (2) MOTHER'S EDUCATIONAL LEVEL, AND (3) FAMILY INCOME LEVEL. THE MEASURE OF LEARNING RATE AS DETERMINED BY THE SEGUIN FORM BOARD WAS THE MOST CONSISTENT IN SHOWING DIFFERENCES RESULTING FROM HEAD START INTERVENTION. THE CHIEF DIFFERENCE SEEMS TO BE THAT HEAD START EXPERIENCE AIDED A CHILD IN ATTACKING LEARNING TASKS. FOLLOW-UP RESEARCH IS NEEDED INTO HEALTH, SOCIAL CASE WORK, EFFECTS ON FORMAL SCHOOLING, AND EVALUATION AND REFINEMENT OF THE PROGRAM. (LG)

FINAL REPORT

Title: EVALUATION OF HEADSTART EDUCATIONAL PROGRAM IN CAMBRIDGE, MASSACHUSETTS

Date: 7/1/65 - 1/31/66

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I. INTRODUCTION AND BACKGROUND:

There is considerable evidence that the early years of childhood are the most critical point in the poverty cycle. During these years the creation of learning patterns, emotional development and the formation of individual expectations and aspirations take place at a rapid pace. For the child of poverty there are clearly observable deficiencies in the processes which lay the foundation for a pattern of failure -- and thus a pattern of poverty -- throughout the child's entire life.

Within recent years there has been experimentation and research designed to improve opportunities for the child of poverty. There seems to be gathering 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.

Many communities have begun pre-school programs as a frontal attack on the "culture of poverty", aided in most cases by federal funds, available increasingly to those willing and able to commit themselves to the cause. In our rush to implement this idea it may be important not to neglect the historical route of the nursery education movement. It is significant to note that nursery education received its impetus from experiments carried on with the very children about whom we have recently become concerned.

Social conditions have acted to spur the educator and the doctor to practice his innovations in pre-school education; and the administrators and people in public life, to implement and support programs. The burst of current projects and programming needs to be placed in the context out of which it has grown. Froebel, Montessori, McMillan and the American modifications of their ideas are landmarks along the way. A brief review

will attempt to put into perspective the contributions that have lived on to lend us direction.

Friedrick Froebel was an educational philosopher whose writings were influential during the mid and late nineteenth century. They encompassed techniques of child rearing from infancy to school age that he hoped would encourage the intellectual and moral development of the child. Best known for the "kindergarten" curriculum he developed for four and five year olds, his ideas were revolutionary for the time.

Froebel's contribution lay in advocating that the child should have the freedom of movement to explore the world. In this notion he was influenced by Pestalozzi's educational experiments with children in Switzerland seventy years before. To Froebel the child was continually gaining new perceptual awareness through active movement of his limbs and his manipulation of objects. As the motor and sensory apparatus matured, new impressions were received from the external world. He hoped that the materials and techniques that he devised would emphasize an ordered outer world which in turn would make for an ordered inner world. The use of language during the child's explorations was aimed at making these impressions of the child conscious and unified. Much of our proposed practice with deprived children today stems from this thesis.

Froebel's program took place in a room with children seated in a circle around the teacher. She and the child were to be bound in the process of observation, more particularly to watch the influence of action; rather than the more traditional approach of the day which emphasized lessons and rote exercises. But the children more often experienced things one step removed. Nature, for example, was learned about through songs for which the teacher taught appropriate hand motions. Extolled were the virtues

of the workman, the rabbit, the growing flower, etc. Crafts were never considered for their own end, but as a way of showing the relationship of mathematical form to living form and to forms of beauty. String beads, making paper boxes, weaving, drawing, modeling clay were all used as activities designed to demonstrate angles, squares and triangles.

Whether in actual practice Froebel's techniques and materials were meeting his objectives is doubtful. None the less Froebel had planted an important idea; Given materials that were appropriate to the child's stage of development, he could learn because of his own interest in seeing and doing. This fact Montessori was more clearly to develop and demonstrate.

Maria Montessori began her work with slum children in 1907 at the invitation of the Director General of the Roman Association for Good Building to organize infant schools. In her Casa die Bambini she hoped to show that children were capable of learning in the pre-school years. Montessori was acutely aware of the disadvantages of growing up in slum areas. Her observations ring true today: "In the tenements exist crowded and expensive living conditions, promiscuity and crime. The lack of privacy, light, air and water is much in evidence."

Extending some of Froebel's ideas, Montessori scaled her program to the size, interest and needs of the child. In a major innovation she brought the child's senses directly in contact with meaningful materials. No longer was the child to sing and make motions of filling a pail full of water, or to detail the virtues of the rabbit. He was to confront the objects directly. She agreed in allowing the child the freedom to explore and teach himself. To this end her didactic materials were more manageable and easier to control. The environment was more in tune with the child's size; the furniture was miniature, a novel idea at the time. The traditional

child's group was abandoned; the child was left alone to pursue his own interests. He was free to solve problems as they were presented, without interference (though they were not self-generated yet).

The program itself was considered reality-bound with no opportunity to play "house" or with "dress-ups". The child cleaned and dusted the room, fed the animals, polished shoes and practiced buttoning with material placed on wooden frames. Repetition was encouraged for the pleasure it gave the child. But the tediousness of teaching children how to wash a table in ten or however many steps was not emphasized as it is by the present day Montessori followers. Reading, writing and numbers were taught in rather formalistic terms in kinaesthetically oriented activities and structural materials specially designed for the purpose. Through the challenge posed by the teacher verbally and her continual use of specific, information-giving words, the child was encouraged to use his powers of observation and express himself effectively and meaningfully.

In brief the children were "learning to learn". Their senses were being trained to perceive selectively; words were used to convey specific communicable meanings. Montessori had added much to Froebel's philosophy. She had described a program of instruction for pre-school children, more specifically children from the slums of Rome. At a similar time an English educator was also demonstrating the effectiveness of nursery education and adding some poignant, far sighted ideas of her own regarding the nursery school in the community and teacher training.

Margaret McMillan was influential in setting in motion the American nursery school movement. She and her sister Rachel worked with pre-schoolers from age one to six in a slum district of London. Begun in January 1900, its popularity reached a peak when the British Parliament

passed the Education Act of 1918 providing tax money for nursery services to children ages two to five when the community so requested. Despite the fact that funds were never fully appropriated, news of the laws passage and the writings of Margaret McMillan were received, initially with curiosity, then with eagerness in America.

McMillan insisted that the child's lack of cognitive growth always be viewed in the context of his family and neighborhood background. In this regard she went further than Montessori who turned to work with the child in isolation, providing him the appropriate cognitive stimulation. Her concept of the nursery school which made up for the effects of social deprivation included provision for medical and dental care, for intellectual stimulation and for work with families. She initiated monthly group meetings with the mothers. Mothers talked about their children; teachers listened and suggested child rearing methods and games that the mother might introduce to the child. Visits to the home were not uncommon to reach the parent emotionally, and especially when child or parent attendance was sporadic. No child was excluded no matter how difficult the situation.

Teachers-in-training were required to live in the neighborhood so that they might understand better the problems of the family: The housing conditions, the cost of food, the needs of the family which lives always on the "brink of financial precipice". To man the centers McMillan instituted a three year course for "free-lance probationers". Of the first three girls trained for the job two had not attended any school after their fourteenth year. In fact, McMillan felt strongly that the young girl had a natural gift with children that she might lose as a more mature woman. Any girl over the age of fourteen could be selected as a

probationer so long as she was modestly bright and had a temperament that abounded in patience. This was on-the-job training in the best tradition; trainees were paid while learning by doing. Besides living in the community they served a part-time three month rotation in the medical and dental clinic in order to increase their observational skills and to enable them to refer the appropriate case from the nursery school.

The schools in which the teacher, probationer and child worked were located on lots on which a building had been erected primarily for shelter. McMillan saw the centers as being mainly outdoors. Play was encouraged in the herb, vegetable and flower gardens, in the sand box, and in the junk heap that was prevalent in England. After reading of these centers some Americans attempted to visit them and they were astonished to learn that they had not spread across England. Dr. Abigail A. Eliot of Boston was the one pioneer of American nursery education who studied and worked with McMillan.

By about 1922 five nursery schools were operating in this country; one started by Dr. Eliot at Ruggles Street in Boston; other, at Iowa University, Merrill-Palmer of Detriot, the Bank Street School and Teachers College of Columbia University in New York City. Much of the further development of program support around the country stemmed from aid given by the Office of Education in the 20's and early 30's. Later the Works Project Administration, in 1936 alone, directed 1500 nursery schools in order to stimulate education and relieve unemployment.

As the years coursed by the major clientele for the nursery school came out of the middle class. Considering the historical underpinnings of the pre-school education movement, this is hard to explain. Some of the reasons point to the flow of our population towards the city with its

limited play area and the swelling number of women who seek employment outside the home. One other consideration involved a wish to increase the opportunity for the child's emotional and social development. The reflection is seen here of the influence of Freud's writings which were popularized in the 20's and 30's.

A profound change occurred as emotional well-being became the clearly defined goal of the nursery school program in all social classes. Visits to the zoo or firehouse are arranged for the whole class to develop a feeling for community life. Expressive experience in art, music, dramatics, as well as science and social studies, are broadened in scope and view. But the all embracing intent is the sound development of the child's relationship to his peers and to adults. He is given the freedom to experience and to identify his emotions and to put them into words, though not destructive acts. In his play simple equipment and everyday materials encouraging constructions, as well as lifelike replica of home furniture are supplied to encourage the acting out of his fantasy life, to further his identification with the members of his family and his view of their work patterns in daily life.

The gamut has clearly been run over the past hundred years from structured to free play, from intellectual to emotional focus as though the two were poles apart. During the past forty years we have witnessed the increasing interest in the emotional life of the child and his parents, indeed his whole familial complex, as proper subject for scrutiny. This is as significant as the realization one hundred years ago that the preschool child, of his own intrinsic motivation, could learn about the external world. By sensory training he differentiated form, color, texture and shape; by expressing this knowledge in speech and writing he elaborated

his motor response to the stimulus. The challenge remains to integrate these two approaches in furthering cognitive and emotional growth.

In The Widening World of Mastery Lois Barclay Murphy and her collaborators comment on this question:

> "Increasing flexibility in understanding children has gradually come from different sources. We are learning to look at both the organism and the milieu with which it is interacting more perceptively than was possible in earlier times, even though Freud, Adolf Meyer, Karl Menninger, Gardner Murphy, Erikson, and others have long emphasized the necessity of giving weight to each. But from the time of Rousseau's insight into the natural growth of a child it has taken nearly two hundred years for the psychological sciences to be able to identify with the young child enough to try to understand his efforts to deal with the world in terms of his childish experience of it. A wide variety of forces have biased our interpretations toward normative, moralistic, and clinical evaluations. None of these has much to do with the child's own need to make himself at home in the world, to find ways of coming to terms with it, and to manage his relation to the environment. To do this we have to observe what is going on, how the child seems to be experiencing a situation, and how he deals with it ...."

This then is the frame of reference for this Headstart research.

The concept behind Project Headstart was a disarmingly simple one, but one which caught and held the imagination of a varied group of people. Politicians, educators, physicians, social workers, and parents were some of those who found real promise in the proposal to take great numbers of children from big city slums and economically depressed back-wash areas of the nation and give them two summer months of pre-school experience plus medical care and social welfare benefits just before they were to enter kindergarten or the first grade.

In Cambridge, Massachusetts, led by the social services coordination agency, Cambridge Community Services, the School Department, the Family Society, the Mental Health Center, and the Health Department pooled their experience and knowledge of the community, plus their commitment to the value of this concept to provide service to children and their

families. The local funding agency for Poverty Bill programs came into existence after the ground swell of enthusiasm and involvement had produced an organizational structure and some initial though tentative constructs of program, staff and facility consideration.

Without chronicling the hectic and confusing preparations, reflected everywhere in the observational and anecdotal accounts now readily available in press and periodical, let us look at the operational picture.

A few children short of 500 were enrolled in 12 centers distributed through the four action areas designated as eligible for assistance through Federally financed programs. These centers included public and private schools, settlement houses, churches and a volunteer agency from Harvard University. In each center maximum use was made of the facility and the staff through separate morning and afternooon groups, each participating in two and a half hour sessions. Around each group of fifteen children clustered four adults, a professionally trained teacher, an assistant who was generally of college age, and two neighborhood mothers who were provided employment in the program. The latter pair functioned as teacher's helpers and as communicants between the teacher and the parents of the children. Social work support and direction was provided, in addition to curriculum specialist assistance, in early childhood education. Patterns of communication were formulated which would enable the staff to support and learn from one another while developing a truly interdisciplinary functioning, although eight weeks was barely time to get underway. Separating the morning and afternoon sessions by a two and a half hour interval was a key mechanism in facilitating this process while providing rest and reflection for teachers, many of whom had no previous experience with pre-school children.

Partly because of the inability of the public school teachers who were employed by the School Department to participate in the training programs established for Headstart teachers at local institutions, the first week of the eight week program was set aside for orientation and preparation for the staff. The program model that was pursued by administration and support people was one in which the youngsters were surrounded by loving and understanding adults who strove to help them develop relationships with their peers, as well as with adults, based on respect and concern for the individual. In addition, an attempt was made to provide a rich environment of materials and equipment so that the child would be encouraged to explore his world. The acceptance and encouragement of diversity in children's interests and pursuits was a primary goal in program planning. Teachers were encouraged to give themselves and the children time -- time for them to satisfy surface interest in their surroundings, time for themselves to observe and interpret what was going on in the actions, the thinking, and the expressions of the ... feelings of the children.

The parents of the Headstart children were made welcome in the Center classrooms for the first two days in shortened sessions. Teachers were encouraged to confer with each set of parents, home visits were made in many cases, and evening meetings were held in a variety of patterns through the city. It is patently clear from the attendance of parents at these meetings that the schools, in the case of Headstart centers at least, were places that these families could trust and respect.

The screening procedures which were a part of the Headstart program were carried out in full with effective coordination of the agencies involved, considering the reality situation, the short time interval

available, the intrusion upon teachers who were in many cases struggling to take on a new stance, a changed way of looking at and thinking about the learning and living patterns of children younger than those familiar to them. Those defects and problems identified have been catalogued by now and the relevant local agency has assumed responsibility for follow-through, while waiting for Federal funding to provide the resources required.

2. SAMPLE SELECTION

The Headstart program in the City of Cambridge was limited to four large areas judged to be areas of greatest need. These action areas included 8 of the city's 30 census tracts. Other census tracts which were similar to these in demographic characteristics served as control areas (see Figure 1). The ideal strategy would have been to select randomly from all of the eligible children in the action areas. Children from the control groups would be watched on selected characteristics with these enrolled Headstart children. However, complete census data for these purposes was not available and there was neither time nor money to undertake this project prior to the beginning of the Headstart program.

There did exist, however, the possibility of selecting a sub-sample of the total pre-school population. In May, parents were asked to pre-register their child for kindergarten for September enrollment. With the cooperation of the Cambridge School Department, these registration lists were obtained for the Headstart and control areas. The percentage of early registration varied from census tract to census tract, and in all the areas, action and control, approximately 40% of the children were

pre-registered. These lists gave a very selected population. However, by using similar registration lists for the control sample, the bias operated for all children selected.

During the month of June, children were actively recruited for Headstart by a doorbell ringing campaign. In the action areas there were 243 children pre-registered for kindergarten. A 100% sample was taken and all of these families were visited at least once and urged to participate in Headstart. One hundred and forty-one children were enrolled in Headstart by this means. Only 20 families were frankly disinterested in the program. The remaining families either could not be contacted or had summer plans that would have conflicted with attendance in the program. Approximately 10% of the population sampled rejected participation in the Headstart program (Table 1). If the family desired to participate in Headstart, enrollment was accomplished at the time of the home visit and a simple questionnaire administered. This questionnaire gave socio-economic information on which to base the election of the control population (see Appendix 1). The criteria for the match are listed in Table 2.

With 141 children enrolled in Headstart on whom the above socio-economic information was available, a control population was identified from the control areas that could be matched to a reasonable number of these Headstart children. As previously stated, there were similar areas in Cambridge not involved in Headstart, and pre-registration lists for these areas were obtained and used as the basis for this selection process. With the agreement of the Board of Health and the pediatricians of Cambridge, all the children recruited from these areas were offered the medical services available in Headstart. This program was called Operation

Table 1 Enrollment Data for Headstart and Control Populations

Headstart Population

Action Area School Registration Lists

Total Number	243
Number Recruited for Headstart	141
Reasons for Non-Participation:	
Vacation	35
Not Interested	20
Not Home	26
Other	21
Total	102

Control Population

Registration Lists for Schools from Comparable Census Tracts

Total Number	160
Total Matched Control Population	40
Reasons for Non-Participation:	
Not Interested	18
Private Doctor	12
Headstart	15
Not Home	53
Vacation	7
Unable to Match	15
Total	120

****

Table 2 Criteria for Matching The Pairs

1. No Previous Pre-School Experience
2. Race
3. Sex and Age of the Child
4. Education of the Mother
5. Age of the Mother
6. Size and Intactness of Family Unit
7. Income of Family Unit
8. Housing
9. Remained in Cambridge for Summer

Check Up. Of the 160 families, 55 agreed to participate (see Table 1). Fifty-three families were not home on repeated visits and seven had vacation plans that would interfere. Since this sampling was done during July and August, it is possible that many of the families not at home were on vacation, making the percentage of vacation and not at home families comparable in both groups. Twelve families contacted said they planned to have a pre-school examination done by their physician, and only 18 families said they were not interested in Operation Check Up. The percentage of disinterested families in Operation Check Up was also similar to that of Headstart and was quite low at approximately 10%. Of the 55 families who agreed to participate, only 40 could be matched with the Headstart population. By early in August there existed a matched-pair population of 80 children. Forty of the children were in Headstart and 40 were involved in Operation Check Up which included only a medical examination and audio-visual screening procedures. The remaining unmatched control children were seen for the same medical examination as the matched control children received.

Handling of Population Sample

During August the mothers of all participating children were re-visited and given detailed information as to the evaluation program scheduled to Monday following the close of the Headstart classes. The plan, as followed, was explained to the mothers of the participating children. This involved having all 80 children come to the Cambridge City Hospital for psychometric evaluation after the end of the Headstart program. At the hospital a special clinic was set up with a secretary, three psychologists, and a pediatrician. The psychologists were all un-

unaware of the child's summer experience and only knew the child's name and age. The secretary was aware of the child's experience and scheduled an equal number of Headstart and control children for each clinic day. A battery of psychometric tests was administered to each child and a tape recording of the interview with the child was made. A detailed description of the testing procedure, as well as the use of an adaptive behavior questionnaire, will be presented in a later section on psychometric tests and evaluation. Following the psychometric tests, all of the control children were seen by the pediatrician for a complete history and physical examination. This examination included audio-visual screening, urinalysis and hemoglobin determination. Transportation was provided for those families who desired it. In this way, all of the children were seen in the three-week period after Headstart ended and before school opened.

The final sample included 33 matched pairs instead of the original 40 matched pairs. The reasons for this attrition are shown in Table 3.

Table 3. Final Study Population

Number of Children Matched for Criteria:	
Headstart	40
Control	40
Total	80
Number of Children Completely Evaluated:	
Headstart	33
Control	33
Total	66
Reason for Difference:	

Failure to Keep Appointments	
Headstart	2
Control	3
Unable to be Tested	
Headstart	2
Total	7

Two Headstart and three control children were unable to keep repeated hospital appointments, and two Headstart children were unable to perform the psychometric tests because they became upset by the procedures on repeated visits. When these children and their matches were eliminated, the final population came to 66 children. Medical examination of these children revealed 22 with severe dental caries, 3 children with strabismus and 1 child with asymptomatic congenital heart disease.

Sample Composition

As stated previously, this sample was not a random sample of all the families from the action areas. These families were probably selected from a sub-sample of the total population which were more interested in their child's education. When the family characteristics of this group were analyzed, it was found that most of the mothers had completed 2 or more years of high school, had incomes greater than $3000/year and the family was intact (Table 4).

3. PSYCHOLOGICAL TEST PROCEDURES AND RESULTS

The following psychological tasks were administered to all the children in the sample:

1. The Peabody Picture Vocabulary Test (PPVT), form B, was

Table COMPOSITION OF THE SAMPLE - 33 MATCHED PAIRS

		Headstart	Matched Controls
Sex	Boys	16	16
	Girls	17	17
Race	White	31	31
	Negro	2	2
No. of Children in Family	(1-3)	14	22
	(4-6)	15	8
	(7-)	4	3
Age of Mother	20-24	3	3
	25-29	12	13
	30-34	8	7
	35-39	4	8
	40-44	5	1
	(1 age missing)		
Education of Mother	<9th Grade	2	4
	9-11 Grade	11	9
	High School	20	20
Type of Dwelling	Project	4	4
	Apartment	19	25
	Private Dwelling	10	4
	(4 2-family homes included as private dwellings)		
Income Yearly	<$3000	2	2
	$3000-5000	16	17
	>$5000	14	14
	(1 missing)		
Intactness of Family	Father Present	31	31
	Father Absent	2	2

administered to all the children in accordance with the procedure described in the manual for administering the test. The obtained raw scores were converted to IQs using the tables available in the manual.

2. The Draw-A-Man Test was administered with the usual instructions as given by Goodenough. The protocols were scored using the norms in the same monograph.

3. A series of geometric designs were drawn from pre-school intelligence scales consisting mainly of the Stanford Binet, form L, Vertical Line (year III-6), The Circle (year III), The Diagonal Cross (year III-6, alternate), and The Square (year V) and the Merrill Palmer Preschool Scale (The Vertical Cross and The Star)[1]. The forms were administered with the instructions employed as standard for the tests in which the items appear, and were scored in accordance with the scales from which they were drawn. The scoring manual is presented as Appendix 2. The stimulus blanks are also included as Appendix 3.

4. The Seguin Form Board as adapted from the Arthur Point Performance Scale was administered in three trials and an error score and the time score per trial was recorded. So few errors were made that the analysis of this data has been omitted since it seemed not to have been a discriminating measure. The manual of instructions used by each examiner in testing the children on these two instruments is presented as Appendix 4.

5. A language sample was obtained from each child by recording the entire verbal interaction between tester and child and then by especially concentrating on obtaining a conversational sample through the medium of

1 The 50% pass level for these latter two tasks comes at 48-53 months for the Vertical Cross (three correct on three trials) and 54-65 months for the Star (one correct on three trials).

talking about a series of toys which were presented for the child to examine. An attempt was made to maximally motivate the child to talk by making a sufficient speech sample a condition for his taking the toy which he designated as his favorite home with him at the close of the session. A more specific description of the procedures relating to this aspect of the data collection can be found in the instruction sheet used by the examiner which is to be included in this report as Appendix 5.

All these instruments were presented individually to each child at one session, in a blind fashion, i.e., the examiner did not know whether the child had participated in Headstart or not. The order of the four tasks was counterbalanced; the speech sample conversations based on the toys presented was always presented last in order. The total length of the session varried from 40 minutes to approximately one hour. The psychological session was always conducted prior to the physical and audio-visual screening which were conducted later in the same visit for the controls.

The results for the various psychometric tests will be presented in the following section. The results for the linguistic analysis of the language samples will be submitted in an addendum to this report early in 1966. It will consist of a syntactical analysis of the language samples of a sub-sample of Headstart and non-Headstart children.

Results:

The data for the psychological measures were analyzed separately. The scores for the tests were analyzed in three major series of analyses. Three of the matching criteria were used as a basis for subdividing the Headstart and non-Headstart groups: sex of child, mother's educational

level (did or did not complete high school) and family income level ($3,000 - $5,000 vs. more than $5,000).

The grade level at which the mothers tended to drop out of school and the frequency of such occurrences are tabled in Table 5. The means and standard deviations for each of the measures subdivided by sex and Headstart or non-Headstart status are presented in Table 6. Inspection of the table reveals that there were few differences in means on any of the measures when they were subdivided by sex. The data most easily lent themselves to a simple comparison of differences between means, and variants of Student's t-test were applied. For the comparisons by sex, the t-test for matched pairs was used since the original matched pairs were maintained. For the remainder of the comparisons by the criteria of mother's educational level of family income level, the t-test for uncorrelated samples was employed.

The results for each of the tasks presented will be presented and discussed separately below.

1. The Peabody Picture Vocabulary Test (PPVT)

The scores on the Peabody Vocabulary Test for the Headstart and control children subdivided by sex revealed no significant differences when a matched Student's t-test was applied to the data. Similarly, when PPVT scores were analyzed for experimental condition by mother's educational level or level of family income, no differences between means were apparent. Significant differences did appear when the mean scores of the control populations were compared. The control children whose mothers had completed high school, or who came from the higher income families, tended to score significantly higher in vocabulary IQ than those children coming from homes in which their mothers had not completed

high school or family income level was between $3,000 to $5,000 (see Tables 7, 8, 9).

2. The Goodenough Draw-A-Man Test

Headstart girls and non-Headstart boys tended to draw more defined figures than Headstart boys and that children from poorer families tended to score lower than those from families whose income ranged above $5,000 (see Tables 7 and 8). The results from the task are not very meaningful.

3. The Geometric Figures Task

Because of the regularities displayed in the data by inspection, this data was analyzed in a Headstart-non-Headstart comparison only. The frequency with which a particular design was acceptably copied was tabled by trial, and analyzed by chi square. When necessary, the frequency data were regrouped to allow for a satisfactory analysis. The contingency tables are presented in Table 10 for each design separately.

Inspection of the tables indicates that the distribution of acceptable and unacceptable drawings did not vary as a function of the intervention of Headstart. That is, as would be expected, the figures requiring copying a vertical line, a circle, a vertical cross (+) and diagonal cross (X) were satisfactorily completed by most of the children on the first trial. This would be as expected since all those designs can be copied by children who are younger than the children in the present study.

The square and the starred cross (*) were considerably more difficult, and were not satisfactorily drawn by most of the children, (see Table 10). However, for none of these designs were there differences as a function of the Headstart intervention.

4. The Time Scores on the Seguin Form Board

Table 6. Means and Standard Deviations for All Measures Administered Considered by Sex of Child and Headstart Status

				Seguin Trials* (in seconds)		
Headstart Males	CA	PPVT IQ	DAP	T_1	T_2	T_3
Mean	59.93	99.25	4.57	54.37	31.56	42.43
SD (N=16)	4.58	13.74	2.45	26.81	4.69	41.68
Headstart Females						
Mean	58.18	96.0	8.71	55.5	36.18	32.75
SD (N=17)	3.00	9.64	2.64	17.46	13.07	8.83
NonHeadstart Males						
Mean	59.68	93.06	6.46	66.37	50.68	40.43
SD (N=16)	3.87	16.28	3.31	39.19	22.16	12.16
NonHeadstart Females						
Mean	58.4	97.18	7.92	70.25	44.26	49.25
SD (N=17)	6.16	13.96	2.47	36.09	19.23	31.09

*Analyzed by Analysis of Variance. See Text.

Table 7. Table of t-test values of Headstart by Sex Comparisons for DAP and PPVT IQ Measures compared Two Headstart and Two Control Groups.

Comparisons of:	DAP	PPVT-IQ
Headstart Males and Headstart Females	5.52[4]	<1
Headstart Males and nonHeadstart Males	1.79[1]	1.126
Headstart Females and nonHeadstart Females	1.46	<1
nonHeadstart Males and nonHeadstart Females	1.313	<1

1 - $p < .10$

4 - $p < .001$

Table 8. Means and Standard Deviations of Psychological Measures When Sample was Subdivided by Level of Family Income

		PPVT IQ	DAP	Sequin Trials (in seconds) T_1	T_2	T_3
Income of $5000 or more						
Headstart	Mean	103.71	6.3	48.76	31.69	29.53
(N=14)	SD	10.10	3.13	16.62	7.24	7.69
Nonheadstart	Mean	101.30	8.27	54.50	39.50	35.35
(N=14)	SD	10.54	3.22	23.70	13.39	10.04
t-test value		<1	<1	.715	1.855[1]	1.67[1]
Income Less Than $5000						
Headstart	Mean	91.52	6.94	59.22	35.55	34.29
(N=18)	SD	10.10	3.60	25.79	11.72	9.80
Nonheadstart	Mean	90.89	5.70	73.50	54.23	52.22
(N=19)	SD	16.16	3.20	33.17	23.71	28.69
t-test value		<1	<1	1.41	2.93[3]	2.44[3]

1 - $p < .10$

2 - $p < .05$

3 - $p < .02$

Table 9. Means and Standard Deviations of Psychological Measures when Sample was Subdivided by Mother's Educational Level

Mothers Completed High School		PPVT IQ	DAP	Seguin Trials (in seconds) T_1	T_2	T_3
Headstart	Mean	97.66	6.22	58.23	31.31	30.88
(N=20)	SD	12.70	3.46	25.11	4.36	6.92
Nonheadstart	Mean	99.50	6.92	57.15	43.22	40.94
(N=19)	SD	13.27	3.51	34.75	19.18	17.80
t-test value		<1	<1	.107	2.63[4]	2.25[2]
Mothers Did Not Complete High School						
Headstart	Mean	97.58	7.4	50.07	37.61	34.38
(N=13)	SD	10.62	3.16	17.48	14.15	11.21
Nonheadstart	Mean	89.50	6.92	78.57	53.61	42.76
(N=14)	SD	15.88	3.13	40.91	22.01	15.21
t-test value		1.40	<1	2.29[2]	2.17[2]	2.01[2]

1 - $p < .10$

2 - $p < .05$

3 - $p < .02$

4 - $p < .01$

Table 10. t-test Values for Psychological Measures on Two Headstart and Two Control Groups when Compared to Each Other for Family Income and Mother's Educational Level

	HEADSTART SAMPLES		CONTROL GROUP	
	By Income	By Education of Mother	By Income	By Education of Mother
PPVT IQ	1.31	< 1	< 1	1.73[1]
DAP	< 1	1.0	1.88[1]	< 1
Seguin Trials				
T_1	1.34	1.04	1.86[1]	1.55
T_2	1.11	1.05	2.84[3]	< 1
T_3	1.49	< 1	2.31[2]	< 1

1 - $p < .10$

2 - $p < .05$

3 - $p < .02$

Table 10 Frequency by which Headstart and Non-Headstart Copied The Geometric Figures Satisfactorily

(1)

Figure 1

Trials	1	2	3	0
Headstart	33	0	0	0
Non-Headstart	28	0	0	1

$x^2 < 1$

(2)

Figure 0

Trials	1	2	3	0
Headstart	32	1	0	0
Non-Headstart	28	0	0	1

$x^2 < 1$

(3)

Figure X

Trials	1	2	3	0
Headstart	25	1	0	7
Non-Headstart	19	2	1	7

$x^2 < 1$

(4)

Figure +

Trials	1	2	3	0
Headstart	31	1	0	1
Non-Headstart	24	1	0	4

$x^2 < 1$

(5)

Figure □

Trials	1	2	3	0
Headstart	4	6	2	21
Non-Headstart	3	7	1	18

$x^2 < 1$

(6)

Figure ✳

Trials	1	2	3	0
Headstart	7	3	1	22
Non-Headstart	3	2	1	23

$x^2 < 1$

A. Analysis by Sex

The Seguin Form Board time scores were anlayzed using an analysis of variance design in which Headstart and controls represented a between groups variable as did sex of the children; the three trials in the Seguin Form Board represented the within subjects variable. The results indicated no differences between the experimental and controls group though the children did show a trials effect, ($F = \frac{27.27}{2,120}$; $P < .001$) indicating that, as would be expected, the children solved the problem much more rapidly over the three successive trials regardless of whether they were experiementals or controls. Boys did seem to solve the problem more rapidly than girls, when the scores for all three trials are considered together (sex main effect $F_{1,60} = 3.86$; $P < .05$) but there was no systematic trend evident when each trial was considered separately by sex. (Sex trials interaction, F=.29, not significant).

B. Analysis by Mother's Educational Level

The second major series of analyses were performed after splitting the experimental and control groups by mother's educational level. Means and standard deviations and t-tests were computed and these are indicated in Table 9 . There were no significant differences in time required to complete the form board on the first trial. The Headstart children whose mothers had completed high school, however, did require less time, and hence may have been solving the problem more rapidly (refer to Table 9), and were more sustained in their learning rate on the task over the following two trials than the non-Headstart children whose mothers had completed high school.

The Headstart children whose mothers had not completed high school were compared with the controls from a similar maternal educational

background. The Headstart children tended to solve the form board problem more rapidly, both on the initial trial and on subsequent trials (see Table 9) than the control children. This difference can be attributed, perhaps, to the effects of the Headstart school experience. It must be recalled however as a precautionary note, that one limiting effect in this entire series of analyses is the fact that no pre-Headstart performance scores were available against which to gauge the changes in performance being ascribed to the Headstart intervention. No matter how effective the Headstart-control matching was, the pairs were never matched on ability measures similar to those administered at the close of the intervention period. Hence, attributing an effect to the Headstart intervention must always include this explicit precaution in interpretation of the test results.

C. Analysis by Income Level

The Headstart and control samples were also split by the income criterion used to match the pairs. All families which reported annual family income above $5,000 were compared with families reporting annual income below $5,000. This is a reasonable split inasmuch as the $5,000 figure is approximately the level of the median income of the city of Cambridge.

The results for the comparisons are approximately similar. The trend of the mean differences confirm those reported for rate of learning the form board problem when samples are compared by mother's educational level. Both the high and low income Headstart groups did not differ in the time required to solve the form board problem on each of the three trials. However, the Headstart children from both higher and lower income homes did differ substantially in the rate at which they solved the problem on the second and third trials from their respective control groups. Anal-

there would seem to be some effect of Headstart that made the children more amenable to the problem solving process and hence, more rapid and more sustained in their effort. The additional finding that appeared in this set of comparisons occurred when the two control groups were compared. The hign income controls required less time to solve the form board problem on all three trials than the low income controls. Interestingly, this latter difference in mean performance level also was apparent in the children's performance on the Draw-A-Man test but not on the PPVT.

In Summary

The measure most consistently predictive of differences as a result of the Headstart intervention was the measure of learning rate, utilizing the Seguin Form Board and repeated trials as the learning task. The effect of the Headstart intervention seems to have been that it aided the child to attack a learning task with greater speed and perseverance than a child who had not had the preschool experience. Further, when more privileged and less privileged groups of controls are compared, within the limited range present in the present samples, effect of greater income in the home was to mimic the Headstart experience, that is, more rapid and sustained learning over all three trials. This result was not confirmed when the groups differing in mother's level of education were compared. Hence, these two measures of social class did not support each other.

The argument can be made that some of these reported results may be spurious since there were a large number of t-tests run on the data. The argument that the results obtained were due to this chance effect can be countered by the fact that the direction of the significant differences were almost always restricted to the Seguin time scores measure, revealing

of differences in the data that cannot solely be due to chance.

Results of the Behavioral Observation on the First or Second Day of Class

It was hypothesized by the Headstart staff that one area in which the experience of Headstart schooling should result in improved performance would be in the child's initial adjustment to school, and it was hoped, a check on his continuing ability to function more satisfactorily in school. Toward this end, as a beginning, all the children who were in school on the first or second day of class were observed from before class started and throughout the session until the class was dismissed. The raters were only aware of the child's name, and had no idea whether the child had participated in Headstart or not. Hence the observations were done "blind." These sessions were shortened periods consisting of approximately 2 hours in the morning and 1½ hours in the afternoon. All the children were rated on their behavior except for nine from the Headstart group and five controls who were absent from the classes. The behavioral observation schedule is presented in Appendix 6.

The schedule contained far more items than could easily be coded by the raters since it was hoped the schedule would serve as a basis for subsequent observations during the school year. Also, these first sessions in school were more structured by the teachers because of the newness of the situation for both children and teachers. Hence, many categories of response could not be rated because there were not a sufficient sample of such behaviors evident in the classroom.

The entries on the rating schedules were coded and the frequency distribution was subjected to chi-square analysis. Within the constraints that some items did not discriminate between the children, e.g., for neatness of dress or cleanliness and others for which a large fraction of children was

rated as "unscored" because the behavior was not evident in the classroom on this atypical school day, only 7 items of 42 yielded a chi square value that had a probability at .10 or higher. These will be discussed below. The frequency distribution for all items are presented in Appendix 7.

The pattern of the distribution with the items that produced significant chi squares suggest that a portion of the Headstart children tended to be uncomfortable and ill at ease within the classroom on the day they were observed. For example, in conversation with peers (item 14) the Headstart children were more frequently rated as nonverbal, limited in verbal interaction or shyer than the control children who had not been to school prior to this session. These latter children tended to be rated as "conversation-appropriate" ($x^2_{1df}=4.50$; $p<.05$). A similar trend appeared in their relations with adults, mainly the teachers, though this trend was much less clearly evident ($x^2_{1df}= 2.02$; $p=.20$). A similar suggestion of discomfort is evident in the poorer level of work habits (item 33), where the Headstart children tended to be rated as needing support or showing a poor approach and poor persistance on tasks to a greater degree than the controls ($x^2_{2df}= 4.618$; $p<.10$). Also, a portion of the Headstart children were rated as tending to leave school somewhat more tensely than the controls ($x^2_{1df}=2.679$; $p=.10$).

The proclivity of a portion of the Headstart children to shift activities with somewhat greater difficulty than the controls suggests this same discomfort but perhaps also a show of passive negativism as well, i.e., some protest to the change in the class milieu from the summer program to this very structured first or second day of class ($x^2_{1df}=2.956$; $p<.10>.05$).

The final item which demonstrates a significant difference, suggests that the Headstart children did perform manifestly better than the controls in this early exposure to school in an area in which the child may have had greater latitude to express himself and his own needs. Thus, the Headstart

children tended to participate in group play with the other children, i.e., pairs of children or larger groups (item 22). More than half of the control children were rated as not participating in any group play during the session observed (x^2_{1df}=15.99; p < .001). Table 11 indicates the distribution for this very interesting finding.

TABLE 11: DISTRIBUTION OF FREQUENCIES FOR ITEM 22 - "LEADERSHIP"

	Leader or Shows Ability to Lead	Follower	Doesn't Join Group	Unscored
Headstart	14	7	0	3
NonHeadstart	9	1	12	5

X^2_{1df}=15.99; p < .001 (omitting unscored cases)

In summary, then, there were indications that there were differences between the Headstart and non-Headstart children in their initial adjustment to school. There are suggestions that a portion of the Headstart children tended to be somewhat more uncomfortable when they were in school on this first or second day. Further, there are also findings which must be taken equivocally, that in those matters where there may have been some latitude for the child to express his own needs such as free play, the Headstart child tended to be somewhat freer and self-directed in his efforts. Thus, the very clear indication on one item that the Headstart child generally played in groups (which however, was not confirmed on item 30) and that they manifest some tendency to resist being pushed from activity to activity at the behest of the teacher.

But these findings of differences between Headstart and non-Headstart children are meagre and quite possibly chance findings because the differences are so minimal. Also, there is some inconsistency in the results, as has

been indicated. Further observations of these children should be conducted to determine whether there are lasting differences during the balance of the school year, at least, that can be attributed to the effects of the Headstart experience. It is probable, for example, that the differences in the tendency to play in groups will disappear since it is probably a function of the newness of the school experience for the control children.

But, whether the discomfort of some of the Headstart children will disappear is a quite important issue that warrants further study to confirm its presence, its degree of transitoriness or permanence, and how it may affect the child. The discomfort may result from a discontinuity between the relative freedom and unstructured quality of the Headstart class by the close of the summer program, and the quite structured kindergarten class on this first or second day. If this discontinuity persists, it may make for adaptive difficulties for the Headstart child. Efforts and recommendations for programmatic changes would then be required to minimize these difficulties.

5. Summary and Conclusions:

A matched pair population of 33 Headstart and 33 non Headstart participants was obtained in Cambridge matched on non previous pre-school experience, race, sex and age of the child, education of the mother, age of the mother, size and intactness of family unit, income of family unit, housing, whether they remained in Cambridge for the summer. These children were seen during the period immediately following. the close of the Headstart program and prior to the start of school. They were seen by psychologists for testing who were unaware of the child's summer experience. The psychological tests were:

1. The Peabody Picture Vocabulary Test, Form B;
2. The Draw-A-Man Test:
3. A series of geometric designs drawn from school intelligence scales

which had to be copied;

4. Three successive trials on the Seguin Form Board (requiring placement of ten variously shaped blocks in the appropriate slots);

5. A language sample

The tasks were administered in a standardized manner. Following this session, the Non-Headstart children were given a physical and audio-visual screening examination.

The measure most consistently predictive of differences as a result of the Headstart intervention was the measure of learning rate, utilizing the Seguin Form Board and repeated trials as the learning task. The effect of the Headstart intervention seems to have been that it aided the child to attack a learning task with greater speed and perseverance than a child who had not had the pre-school experience. Further, when more privileged and less privileged groups of controls are compared, within the limited range present in the present samples, effect of greater income in the home was to mimic the Headstart experience, that is more rapid and sustained learning over all three trials. This result was not confirmed when the groups differing in mother's level of education were compared. Hence, these two measures of social class did not support each other.

All the children were seen again in their clasrooms on the first or second day of school and rated on the behaviors they displayed. The raters were unaware of the child's summer experience.

The ratings indicated that there were differences between the Headstart and non-Headstart children in their initial adjustment to school. There are suggestions that a portion of the Headstart children tended to be somewhat more uncomfortable when they were in school on this first or second day. Further, there are also findings which must be taken equivocally, that in those matters where there may have been some latitude for the child to express his own needs such as free play, the Headstart child tended to be

somewhat freer and self-directed in his efforts. Thus, the very clear indication on one item that the Headstart child generally played in groups (which however, was not confirmed on item 30) and that they manifest some tendency to resist being pushed from activity to activity at the behest of the teacher. These findings of differences in adjustment to school are meagre and possibly chance findings.

Some conclusions which may be drawn from this study are:

1. The need for planning time and funds has become a priority concern as community programs increase in complexity. The need here is not only to plan the programs themselves but also to plan the integration of these programs into existing community facilities. This becomes very clear as we view Headstart as part of a continuing education in the local school system. Pre-school programs have no meaning unless they bear a relationship to the later experience of the child in the school system. As the very tentative findings in the behavioral observation suggest, a discontinuous learning experience may be most detrimental, especially for the young child.

Particular attention must be paid to these types of problems. Research designed to follow children who have attended pre-school classes must focus on the effects of sending children from a relatively unstructured class, such as characterized the Cambridge Headstart classes to highly structured kindergarten classes as was the case on the first days of school when the behavioral observations were made. Program planning might then focus on the issues surrounding how particular classroom milieus, continuous or discontinuous over time, influence the attitudes and performance of young children in school.

2. Provisions for follow up must be made in whatever area need exists such as health and social case work as well as education.

3. In any program directed towards alleviating poverty and helping underprivileged children, one must constantly work at involving these families most in need of the program. It is all too easy to involve active partici-

pating families from the community and all too difficult to find and recruit those in greatest need. This was always a problem and in the present study will continue to be one unless greater efforts are expended at this level of recruitment, and ways of locating the most needful families are developed. This process is expensive and requires greater time between funding and the start of classes.

4. Any program aimed at eliminating such a multifactored problem such as poverty is going to be more effective on some counts than on others. In order to delineate the most effective and efficient means of approaching this human problem we must constantly evaluate and refine our approaches. We must give emphasis to those aspects of the program that are most effective and alter those portions that do little good. This means that an ongoing program of well designed, well controlled research activity must be carried on. It is also necessary for those interested in cognitive functions and adaptive behavior to design satisfactory instruments that will be effective in measuring these aspects of human behavior.

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Next steps are some trial categorization and coding of material; generation of specific hypotheses; and trial testing of procedures.

III Summary and Conclusions

In summary, this investigation was designed to develop methodological approaches for obtaining and analyzing continuous, expressive, interactive language samples used by pre-kindergarten children with each other in summer (1965) Head Start programs.

Written narrative descriptions and taped recordings were employed by several Investigators as bases for collection of language samples. Each Investigator was attached regularly 2-4 days per week to one Head Start class. Variations of two approaches to development of a standard-stimulus situation were explored: simple, structured devices, and a semi-controlled, free-play situation. Some preliminary schemes of ratings the verbal facility of children, and of analyzing taped material were proposed. Problems in collection and analysis of language data were described.