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ABSTRACT

The present study was undertaken to investigate the interplay of motivation, socio-emotional interactions between the child and his educators in the impact of early educational intervention on the later development of disadvantaged children. The study attempted to concentrate on obtaining a broad spectrum of the child's functioning and changes in the child's functioning over time. The focus was equally on immediate and long range effects of early educational intervention. By attempting to encompass a wide range of the child's functioning and a broad temporal span it was hoped to avoid ending up with fragmented findings. The children were drawn from four public schools located in an urban slum area. Negroes constitute seventy-one percent of the population in the target area. Each of four schools in the area opened a nursery program for 15 four-year-old children. Each classroom had one head teacher and one assistant teacher. The classes operated four days a week; on the fifth day, the teachers were engaged in a continuation of their in-service training program, making home visits, and working closely with parents and school personnel. Three different types of measures were employed to assess development in the area of intellectual functioning: standardized intelligence tests, measures of academic achievement, and a measure of cognitive style. Measures of socio-emotional functioning were also employed. Two major findings are: (1) The three groups on entering school did not differ from each other on their intellectual functioning; and (2) Initial exposure to school resulted in a larger increase in the level of intellectual functioning. (CK)

IMPACT OF EARLY EDUCATION ON DISADVANTAGED CHILDREN +

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Introduction

The last decade has witnessed an increased concern with extending education downward to younger children so as to counteract the immense waste of human potential which has resulted from leaving the mental, social, and emotional development of young children exposed to uncontrolled forces which all too often deform and destroy potential talent and future manpower. The rights of children to an opportunity for educational experiences which will enable them to develop whatever talents they might have so as to function more adequately and productively in their adult life are not taken for granted in our adult-centered society. Apparently, these rights and validity of claims for their potential benefit of exposure to educational experiences early in life have to be demonstrated time and again in order to turn the observations and insights of John Locke, Jean Jacques Rousseau, Pestalozzi, Montessori and John Dewey into a viable institution in our society.

The present study was undertaken to investigate the interplay of motivation, socio-emotional interactions between the child and his educators in the impact of early educational intervention on the later development of disadvantaged children. The study attempted to concentrate on obtaining a broad spectrum of the child's functioning and changes in the child's functioning over time. The focus was equally on immediate and long range effects of early educational intervention. By attempting to encompass a wide range of the child's functioning and a broad temporal span it was hoped that we might avoid ending up with fragmented findings which often constitute answers in search of questions rather than answers to questions.

Sampling

The children in this study were drawn from four public schools located in an urban slum area of North Philadelphia. Negroes constitute seventy-one per cent of the population in the target area. Occupationally, the target area was characterized by unskilled and semi-skilled labor with a small proportion of people in the clerical labor group. There was a hard core of Negro residents without any real work histories and a low level of employability. The employment problem was further intensified by automation and out-migration of industry curtailing the number of unskilled and semi-skilled jobs available. The median income was $3,383. Twenty-seven per cent of the housing was classified as "deteriorated" or "dilapidated" in comparison to thirteen percent in the rest of the city.

Each of four schools in this area opened a nursery program for fifteen four-year-old children. Applicants were recruited through notes to parents of all pupils attending each of the four schools which announced the opening of such a program. The criteria used to identify "eligible" children were: age: three years and seven months to four years and six months; children without serious physical or mental handicaps; dependency of family on public services; mothers working; and broken homes. From the applicants from each of the four classrooms fifteen children were selected randomly for enrollment. Ninety per cent of the children were black and all came from lower class deprived families (See Table 1).

Fifty-six of the original children graduated to kindergarten in the same four public schools in which they had attended nursery. Group II consisted of fifty-three five-year-olds who entered the same kindergarten

classes as the children of Group I, however, without prior nursery experience. These children were selected from a larger group to approximate age, sex distribution and ethnic background of the children in Group I. The majority of children in Group I and II graduated from kindergarten to First Grade classrooms in the four same schools in which the original program started. All children from Group I and II were assigned to First Grade classrooms in each of the four schools in such a way that an equal proportion of children from Groups I and II would have the same teachers. This was done to reduce differential effect of the educational experiences due to differences between classrooms and teachers. From the first grade classrooms in which fifty eight children of Group I and II were enrolled a third group of children was selected who had no prior preschool experience. Again these children were selected to be comparable to the age, sex distribution, and ethnic background of children in Groups I and II. All three groups of children were again kept together within the same classrooms and with the same teachers during the Second Grade. After that time however, so many children had transferred to different schools in the city that it did not seem practical to continue the battle of keeping the few remaining children in the four original schools in the same classrooms. However, all children were followed up individually each year to the end of the Fourth Grade although the total sample had spread to eighty different schools in the city of Philadelphia. One hundred and fifty children or approximately ninety per cent of the original one hundred sixty-eight children were still reached by the end of the fourth grade. Evidently, a major effort of the present study went into tracing and reaching the children so as to avoid attrition and distortion of results.

The Pre-School Program

Each classroom had one head teacher, and one assistant teacher. The head teacher was a fully accredited teacher selected from the staff of the Philadelphia PUblic Schools who has had previous early childhood teaching experience.

The assistant teacher, in every case, was a Liberal Arts graduate with no teaching experience. The selection of the assistant teacher as a non-trained teacher was a deliberate one. The intention was to encourage persons with teaching potential to enter the teaching field where the challenge was apparent.

The classes operated four days a week. On the fifth day, the teachers were engaged in a continuation of their in-service training program, making home visits, working closely with parents, Home-School Coordinators, the Social Worker, and the school personnel. Where necessary and desirable they were in contact with appropriate community agencies, although the main responsibility for this work rested with the social service team.

An in-service training program was carried out with the primary objectives to continue the re-education of teachers to work in preschool programs in disadvantaged communities and to begin developing some curriculum guidelines based on the epxeriences and experimentation in the nursery schools during the past and current years.

Specific objectives were a) to emphasize the imperative need for the school to help offset or compensate for the deprivation in the lives of disadvantaged children; b) to help teachers understand 1) basic nursery school procedure and programming; 2) the special needs of the disadvantaged child and the deficits in foundation learning and skills that handi-

cap him when he enters the middle-class academic environment of the school; and 3) the strengths and positive elements in the child and his family which can be utilized in the school setting; c) to help teachers develop the ability to identify deficits in the total group and in individual children and provide compensatory learning experiences in the preschool program; d) to experiment with, and evaluate, specific techniques and curriculum materials for helping the disadvantaged child develop the underlying abilities, skills, and understanding necessary to meet successfully the demands of the classroom; and e) to help teachers recognize the need to reach out to work with the parents of the children.

The total teaching staff met with the Project Director one afternoon a week for a two-hour seminar. During the year, the direction of the curriculum guide planning changed several times as a result of ongoing evaluations of the results. The purpose was to develop guidelines that will be helpful to similar programs.

The Project Director visited each school as often as possible to observe and confer with teachers concerning their program and their overall performance.

All assistant teachers were required to enroll in a course in child development or nursery school curriculum as part of their in-service education.

The teaching staff sought to establish and maintain a close relationship with parents through home visiting, parent conferences, small group get-togethers, and inviting parents to observe and participate in

the group. Much of the work with the parents was informal. Expectations of cooperation from parents varied depending on their interests, confidence, and understanding of the school's goals.

Teachers often sent short notes home telling about something of interest to the parent: the child's adjustment, the program, or some bit of information that was "good news" and served to keep the home and school in a positive relationship. A small booklet containing information of help in planning for their children over the summer was given to the parents at the end of the year. It also listed the various services that were available to the families -- welfare and recreational.

The interest of the parents in the program was evidenced by parents appointments for conferences, health examinations for their children, or with the social worker. Several parents participated in the program as an aide to the teacher in the group or on trips. Parents were anxious to discuss their children and the nursery school with the teachers. Parents took responsibility for following suggestions make by teachers and/or the social service staff for helping children at home or functioning more effectively as a family. Many parents referred neighbors to the nursery to enroll their children.

A social worker and four home-school coordinators were employed to offer social services to the parents and children.

The duties of the Social Worker included offering casework services to families with special problems; helping them use community resources; interpreting the goals of the educational and social service aspects of the Nursery School Program to the community.

The Home-School Coordinators, were people who lived in the neighborhood of the school. The selection of neighborhood people was based on the assumptions that: 1) the parents would respond better to someone

from their own neighborhood and 2) they would know and understand the people and the problems better than an outsider. One Home-School Coordinator was a graduate student in guidance and counseling. This was an exploration of the effectiveness of using students in such areas.

The Home-School Coordinators' major function was to help establish a close relationship between the nursery school and the families through home visiting and helping families with housekeeping and management problems.

A health program was instituted to secure physical examinations, immunizations and treatment. During the school year it was noted that several children had eye problems and each was handled on an individual basis. During the school year the Social Worker had direct contact with several social agencies regarding service to parents.

The program was a Traditional one which was concerned more with the child's curiosity for discovery, and with the child's creativity stressing the warm, nurturant, personalized handling of the child by his teachers. An emphasis was placed on developing a program geared to each child's readiness rather than premature introduction of concept and practices in skills which might have a negative influence on the child's interest, cooperation and attitudes. The program attempted to establish a proper balance of self-initiated and structured activities. The structured part of the program was designed to extend the child's knowledge of the world and help him develop the kinds of perceptual discriminations and foundation skills that would facilitate his readiness to benefit from educational programs when he enters formal schooling. The content of the program concentrated on training in language facility, auditory and visual discrimination, listening and paying attention, conceptualiza-

tion, information about the environment, motor coordination and control, and self-esteem.

In all, the program was child-centered in the sense that an adult provided the child with opportunities to choose from a variety of learning resources, and learning was shaped around a child's needs and preferences. The adult accepted and appreciated divergent reactions of the child and permitted the child to arrange his own individualistic sequences rather than urging the child to follow prescribed ways.

In addition to the intensive planning and inservice training, the program was characterized by a great deal of dedication and enthusiasm on the part of the teaching staff as well as the four principles of the schools in which the program was carried out.

The kindergarten program was a conventional educational program. Although the educational philosophy of the supervising staff was exactly the same as prevailed in the prekindergarten program the ratio of one teacher to thirty children and the sharply reduced supervision and opportunity for daily planning made it extremely difficult to implement a child-centered program.

II. General Methodology

Measurement

A major objective of this study was to employ multiple criteria in the assessment of the impact of early educational intervention on the intellectual and socio-emotional development. Three different types of measures were employed to assess development in the area of intellectual functioning: Standardized intelligence tests, measures of academic achievement and a measure of cognitive style.

Standardized Tests of Intellectual Functioning. The Stanford-Binet Intelligence Test (Terman, L.M. and Merrill, M.A., 1960) and the Goodenough Draw-a-Man test (Goodenough, F.L., 1926) were administered annually to each child from nursery to the end of the fourth grade. The Peabody Picture Vocabulary Test (Dunn, L.M., 1959) was administered individually to each child from kindergarten to the end of fourth grade. The three tests were selected to obtain a broad base of intellectual functioning for the evaluative study of the impact of early educational intervention on intellectual development. The Stanford-Binet Intelligence Test is made up of a comprehensive battery of items which emphasize equally a variety of dimensions of intellectual functioning, e.g., verbal and non-verbal, comprehension and expression, inductive and deductive reasoning. This test is designed in such a way that it is extremely difficult to extract specific dimensions of intellectual functioning without violating the assumptions underlying their measurement. Thus, the strength of this test lies in its comprehensiveness which is in accord with its theoretical objective of obtaining a measure of "general" intelligence. The weakness of this test results from the fact that it is not as suitable as more specialized tests for the diagnosis of special handicaps and for the evaluation of the effectiveness of techniques instituted to overcome such handicaps. The Goodenough Draw-a-Man Test is primarily a performance measure of intelligence. A major advantage of this test is that it does not require verbal skill on the part of the testee and, as a measure of intelligence, it is probably less affected by the cultural differences and educational background of the child than verbal tests of intelligence. Moreover, the Goodenough Draw-a-Man Test also involves visual motor coor-

dination which is particularly important at the earlier age levels and has implications for self-image which are particularly important in the study of disadvantaged minority groups. Past studies have shown that the Goodenough Draw-a-Man Test is sufficiently correlated with the Stanford-Binet Test to demonstrate its validity, but the correlations are not so high that the two tests cannot be considered to measure different aspects of intellectual functioning. While the Draw-a-Man Test measures primarily expressive intelligence the Peabody Picture Vocabulary Test measures essentially receptive intelligence. Although this test is less well standardized than the Stanford-Binet or Goodenough Test it has the advantages of being very easily administered, it can be given by non-professional personnel with a minimum of training and it has been used widely in evaluative studies of educational programs for disadvantaged children.

Academic Achievement

Another diagnostic method of intellectual functioning was based on academic achievement in the classroom from the First through the Fourth grade. Classroom marks were obtained annually for each child from the files of school records. It has often been pointed out that teacher grades suffer from the fact that they are not standardized and that they are greatly influenced by subjective impressions and other factors irrelevant for an objective appraisal of the child's academic achievement. Nevertheless, the present writer considered classroom grades important and valuable information. First, a classroom grade constitutes tangible evidence to the child and his parents of his academic achievement and

therfore, functions both as a criterion as well as motivator for his subsequent efforts in school. Secondly, the fact that children transferred to as many as eighty different schools in which teachers had no knowledge of the time the child entered school made this information on classroom performance an unbiased, conservative, and therfore potentially valuable measure in our study.

Cognitive Style

A third and final measure of intellectual functioning was based on Kagan's test for Matching Familiar Figures designed to assess reflective and impulsive cognitive styles. (Kagan, J., 1965) This test was administered during the fourth grade to eighty-five per cent of the original sample of our children.

Measures of Socio-Emotional Functioning

As in the case of intellectual functioning we attempted to obtain a wide range of motivational and socio-emotional measures in order to assess the impact of early educational intervention in this area. Some of these measures were based on the child's functioning in the test situation, some dealt with the child's reaction to other people in the educational situation, others dealt with the child's attitudes and emotional reactions to academic pursuit and his own perceived level of success and failure in this area. Some of the measures were obtained during the first year after the child entered school, others from four to six years later when the child had accumulated a good deal of experience in the educational situation. In spite of the wide range of content, method, and time of data collection our measures of the child's motivational and

socio-emotional functioning were all meaningfully related to each other because they all shared a common reference point, namely the child's reaction to the educational process and to his perceived role in the classroom as a pupil, a peer, and an individual in his own right.

The child's reaction to his social and physical environment within the classroom was assessed through systematic ratings of the child's dependency on adults, his aggression against others, his autonomous achievement motivation in his interaction with his physical environment, and his conflict in turning to others for help, support, and affection. These measures were obtained through repeated ratings of children by two independent observers in the nursery, kindergarten, and first grade. Each measure involved rating on a seven point scale. The measures of dependency on adults involved ratings on the frequency and intensity of the child's requests for help, recognition, proximity, and contact with his teachers or other adults in the classroom. A child's aggression was measured in terms of the frequency with which he exhibited threats, derogation, physical attack against people and destruction of materials in the classroom. Autonomous achievement striving was measured in terms of the frequency with which a child initiated activities, tried to overcome obstacles, tried to complete activities by himself and derived satisfaction from work in terms of manifest tension reduction following his achievement effort. The measures of dependency conflict or mistrust consisted of four specific scales: inhibition, indirectness, inconsistency within time as well as over time in the expression of request for help, attention, and affection from adults. Details of the construction and validation of these measures have been reported elsewhere. (Beller, E. K., 1959, 1961, 1972)

The child's attitude toward learning and toward school as well as his success in his academic effort and in relating to his peers were assessed through ratings by his teachers during the first and second grade. The child's motivational and emotional reactions to individual testing carried out by the research team each year were assessed through a series of seven point scales constructed by the present writer for this purpose. The scales covered the following dimensions: cooperative to resistant, involved to uninvolved, low to high persistence, rigid to flexible, and relaxed to tense. These scales were applied by the examiner following each individual testing period from nursery through the third grade. Only data collected during testing from first to third grade were analyzed.

The additional measures in the socio-emotional realm dealt with the maturity of the child's moral judgment and the child's self-concept. Both of these measures were obtained at the end of the fourth grade on eighty-five per cent of the original sample. The measures of moral judgment consisted of eighteen stories adapted from Piaget's assessment procedure for moral realism. (Seltzer, A. and Beller, E. K. 1969). The measure of the child's self-concept was based on the Piers-Harris Test, (Piers, E. V., and Harris, D. B., 1964) a self administered eighty item questionaire.

Evaluation

The outcome of the overall analysis in which children entering school at different times were compared on the three standardized intelligence tests are presented in Table 2 and Figures 1-3. One major finding was that our three groups did not differ from each other on their intellectual functioning when they entered school at four, five, and six years of age.

For both the Stanford-Binet and the Draw-a-Man Tests on which comparisons were possible and tested by one way analysis of variance the differences between the three groups were not only statistically insignificant but also below three points and within the standard error of measurement. This finding has two important implications. First, it demonstrates that our three groups of children were not biased with regard to their initial level of intellectual performance when they entered school. This is particularly important since these groups were not assigned randomly at the outset of the study. Secondly, it can be seen that the absolute level of the child's intellectual functioning when he starts school varies as a function of which intelligence tests one uses. On the Draw-a-Man Test these children function initially only slightly below average for the standardization group, that is, between average IQ scores of ninety-seven and ninety-eight. On the Stanford-Binet the average IQ scores of the children from the three groups ranged from ninety to ninety-two, that is, at the lower end of the normal range when compared to the standardization group. On the Peabody Picture Vocabulary Test the initial level of intellectual functioning was considerably more depressed than on the other two tests since it ranged from the average IQ scores of eighty-one to eighty-two for the kindergarten and first grade groups when they entered school. Thus, depending on the type of test used for generalization one might say that the initial level of intellectual functioning of disadvantaged children must be qualified depending on the test used to determine such a level. In our particular case the two tests yielding the largest differences are the Draw-a-Man Test which is based purely on performance and yields a high score compared to the Peabody Picture Vocabulary Test which is a verbal comprehension test

involving no expressive performance items and yielding the most depressed score. The Stanford-Binet Test which is based on a comprehensive battery of both verbal and performance items yields an intermediate level of functioning which falls approximately between the two extreme levels yielded by the other two tests.

A second major finding which can be seen from the data presented in Table 2 and Figures 1 and 3 deals with differences in the initial exposure of a child to formal education. It can be seen from inspection of Table 2 and Figure 1 that although there was no difference between a child's absolute level of intellectual functioning when he entered school the initial exposure resulted in a much larger increase in the level of his intellectual functioning when the child entered school earlier rather than later. The increase was over six points (92.1 to 98.6) from nursery to kindergarten, dropping to an increase of over three points (92.2 to 94.4) for the children entering kindergarten to their performance in the first grade, and turning to a decrease in the children who entered school at first grade (from 89.9 to 88.6). These changes were found to differ significantly from one another when tested by an analysis of variance for repeated measures. ($F = 10.98$, $df = 2/159$, $p<.01$). The conclusion from these findings, is that the boost in the level of intellectual functioning resulting from a child's initial exposure to formal education is greater the earlier the child starts school.

When we consider next the prolonged impact of educational intervention from the time the child entered school until the end of the fourth grade it becomes evident that this will vary markedly as a function of the test employed or the dimension of intellectual functioning

measured. On the Stanford-Binet Test it is evident from inspection of Table 2 and Figure 1 that after the initial boost the level of intellectual functioning remains remarkably stable from year to year. Similarly the difference between the three groups remains stable with the nursery children maintaining their advantage and the first grade children performing consistently lower than the children who entered school before first grade. The difference between the three groups from first to fourth grade was statistically significant when tested by an analysis of variance for repeated measures ($F = 6.71$, $df = 2/429$, $p<.01$). It should be emphasized at this point that testing of all children was blind and the team of testers changed from year to year. The remarkable stability of the test and its sensitivity to early educational intervention must also be emphasized. Although all children started school with the same depressed average intellectual level of functioning those children who experienced the earliest educational intervention reached an approximately average level of intelligence on this widely used and well standardized test of intellectual functioning.

An analysis of variance carried out on Peabody Picture Vocabulary IQ scores of children from the first to fourth grade yielded similar results as those obtained from an analysis of Stanford-Binet IQ scores. Again we find that after the initial rise from kindergarten to first grade the children settled down to a fairly stable level of intellectual functioning from first to fourth grade. Although the differences between the three groups were less marked than those on the Stanford-Binet the differences were in the same direction and statistically significant when tested by an analysis of variance for repeated measures ($F = 3.40$,

df = 2/414, $p<.05$). It is important to point out at this point that the Peabody Picture Vocabulary Test which was more economical in terms of time for administration as well as in the amount of training necessary for an examiner to administer the test yielded essentially similar findings as those based on the Stanford-Binet and correlated between .60 and .70 with Stanford-Binet IQ scores. However, as will be seen later in this chapter, the Stanford-Binet test yielded much more stable findings, was more sensitive to the impact of early educational intervention and was apparently less affected by cultural factors than the Peabody Picture Vocabulary Test.

When we turn to the findings obtained from the Goodenough Draw-a-Man Test it can be seen from inspection of Table 2 and Figure 3 that the outcome differed from the findings obtained on the first two tests. Whereas the three entrance groups differed by the first grade on the Stanford-Binet and Peabody Picture Vocabulary Test scores (in the order of better performance the earlier the educational intervention started) the three groups did not differ in the first grade on their Goodenough Draw-a-Man IQ scores. In contrast to the stability of performance over time on the Stanford-Binet and Peabody Picture Vocabulary we find a steady overall decline in Goodenough IQ scores from first to fourth grade. This overall decline was statistically significant when tested by analysis of variance ($F = 26.50$m df = 2/426, $p<.01$). Moreover, as can be seen from Table 2 and Figure 3 the decline was proportional to the timing of school entry. IQ declined more steeply from first to fourth the later the child entered school. As can be seen from Table 3, the correlation between grade and IQ became increasingly more negative the

later the child entered school. Thus, the correlation of the decline of IQ with increasing age was small and insignificant for the children entering school at nursery, larger and significant ($p<.05$) for the children entering school at kindergarten, and largest and most significant ($p<.01$) for the children who entered school at first grade. Finally, when the declines in the three groups were compared, the difference between declines in Group I and Group III were found to be statistically significant ($t = 1.93$, $df = 419$, $p<.05$). Insofar as the drawing of a person can be taken as a reflection of a child's perception of people and of his self-image, these findings would suggest that a later start in school and continued negative educational experiences in a child's life will result in a decline of his performance on this particular task. Such a conclusion seems to be supported by the fact that this decline is differential and largest in the group of children who start school latest and continually perform more poorly on intellectual tasks than the other two groups.

It is clear from the forgoing that the employment of multiple criteria is extremely valuable in the evaluation of immediate and prolonged effects of early educational intervention, especially in disadvantaged children. The use of single criteria may easily lead to erroneous or inadequate conclusions with regard to the absolute level of intellectual functioning of disadvantaged children. The use of single criteria may also lead to inconsistent findings with regard to prolonged effect of early educational intervention over time. In the present study we have seen that the Stanford-Binet was particularly sensitive

to initial beneficial effects of educational intervention in the nursery and in the kindergarten. In sharp contrast the Goodenough Draw-a-Man Test revealed an equally marked but considerably delayed effect of early educational intervention.

Finally, the findings presented so far for the Stanford-Binet and Peabody Picture Vocabulary Tests are in general agreement with findings reported by two other major intervention studies. (Gray, S., and Klaus, R.A., 1970, and Weikart, D., 1971). As discussed elsewhere (Beller, E. K., 1972) all three studies show an initial positive effect due to early educational intervention. The initial rise is more dramatic but less sustained over time in the other two studies when compared to our own findings. This difference is understandable in the light of a lower initial level of intellectual functioning of children in the other two studies, as well as differences in the salience of early intervention, e.g., a summer program in Gray's study versus a full year preschool program in the present study, and rural setting of the other studies versus a large metropolitan environment as the setting for the present study. However, considering the basic objectives of all three studies, the similarities are more impressive than the differences.

Academic Achievement

Before we turn to findings in this area it should be reiterated that children were distributed over as many as eighty different classrooms by the fourth grade.

The report of our analysis of academic achievement will be limited to five major subjects: arithmetic, reading, spelling, science, and

social studies. Marks were available for arithmetic and reading from the first to the fourth grade and for spelling, science, and social studies from the second to the fourth grade. Findings were analyzed separately for boys and girls since consistent differences occurred between the two groups in comparisons between children who entered school earlier and later. The findings for the girls are presented in Table 4. As can be seen from inspection of Table 4 the findings are all in the predicted direction for each of the five subjects from grade one through grade four. An analysis of variance for repeated measures yielded significant differences between the three groups throughout all grades ($p<.05$, or $p<.01$) for reading, spelling, science, and social studies, while the difference approached significance ($p<.10$) for arithmetic. It is also evident from inspection of the data that although the differences between the three groups of girls decreased by the fourth grade the order remained consistently in the predicted direction, that is, with girls who had entered school earlier ahead of girls who entered school later.

The findings were much less consistent for boys than for girls. As can be seen from inspection of Table 5 the major difference between groups was the superiority in marks for children who had preschool as compared to children who had no preschool. Among the preschool boys the Kindergarten group was consistently ahead. The magnitude as well as order of difference varied from year to year much more than was the case for girls. The three entrance groups of boys differed significantly ($p<.05$) on spelling and approached significance ($p<.10$) on reading and

social studies.

One might conclude from these findings that the effects of early educational intervention of disadvantaged girls appears to have been consistent and prolonged through the fourth grade. The findings for boys, although generally in the predicted direction, are less marked and less consistent.

Motivational and Socio-emotional Functioning of Children

In order to assess the impact of early educational intervention on motivation as well as on achievement, teachers in each classroon were asked to select two extreme groups of three children each who manifested best or worst attitudes towards study and learning, most positive versus most negative attitudes towards school, and who were most or least popular among other children. After the teachers had selected such groups who contained often children who had not been part of our study we examined the groups to find whether children from our study were included in the two extreme groups. These data were collected only during the first two grades of elementary school and the outcome of the analysis is presented in Table 6. It can be seen that early educational intervention effected not only academic achievement but also the child's attitude towards learning and toward school. In both areas the three groups differed significantly from each other with the children who entered school at nursery age being most frequently represented in groups characterized as having the best attitudes towards learning and school, and conversely least often represented in groups characterized as having the worst or most negative attitude towards

learning and school. Early educational intervention did not affect a child's popularity among other children at le as perceived by the teacher. We shall see later that this item did differentiate between groups on a self-concept test given in the fourth grade.

In order to get a broader assessment of the child's reaction to the learning situation we also obtained measures of such reaction in individual situations in which the research team carried out intelligence testing. The children's reactions in these situations are presented in Table 7. It can be seen that children with preschool experience, that is Group I and II were consistently more cooperative, more involved, more persistent in their effort, and more relaxed in the test situation than children who had neither nursery nor kindergarten experience. These differences were significant for cooperation, involvement, and persistance ($F = 6.24$, $df = 2/114$, $p<.01$; $F = 5.33$, $df = 2/114$, $p<.01$; $F = 3.42$, $df = 2/114$, $p<.05$ in that order). The difference between entrance groups on relaxed versus tense, although in the predicted direction, fell short of significance ($F = 2.26$, $df = 2/114$, $p<.15$). The measure of rigidity and flexibility apparently varied in a very complex way which does not lend itself to a simple generalization. In all, our findings show that earlier or belated educational intervention affected, significantly, not only academic achievement but also children's attitudes toward learning and school manifested in the classroom and their motivations to achieve and their emotional reactions to individual testing.

We shall now turn to our findings based on measures of dependency, aggression, autonomous achievement striving, and dependency conflict which were obtained in the classroom situation for children in the

nursery, in kindergarten and in the first grade. Although the brief discussion which follows is not directly concerned with the issue of the impact of early intervention it is introduced at this point to provide a better understanding of these motivational variables.

The interrelationships between motivational measures are presented in Table 8. Two sets of relationships presented in this table are of theoretical interest. Dependency and autonomous achievement striving were conceptualized and measured in such a way that they do not represent opposite ends of a bi-polar continuum. This means that on these measures a child can be both dependent and autonomous (or independent) although the balance between these two motivational factors within a child may have implications for conflict. As can be seen in Table 8 a modest negative relationship is found in the nursery children between dependency and autonomy but this relationship disappears completely in kindergarten and in first grade. Thus, in the present study it should be kept in mind that dependency motivation and autonomous achievement striving or independence are not opposite ends of one continuum. The next relationship of theoretical concern is that between dependency motivation and dependency conflict. The distinction between dependency motivation and dependency conflict is useful in terms of measurement only if the two are uncorrelated. A high negative correlation between these two measures would mean that one would not know whether high dependency motivation means low conflict or whether high dependency conflict is actually equivalent to low dependency motivation. As can be seen in Table 8 in the present study, the two measures are almost entirely unrelated, especially in kindergarten and first grade. Turning to sub-

stantive relationships we find that two correlations are consistently significant and persist on all age levels. Dependency motivation and aggression are positively correlated on all age levels although there is a small decline in the first grade. It seems that the child who seeks contact and attention from others expresses his need both in positive and negative (aggressive) ways. Moreover, excessive dependency demand and wishes are likely to result in frequent frustration which in turn may generate aggression. On the other hand, the aggressive child who cannot control his impulses is likely to be more helpless and elicit help from adults in his environment. It would seem that the high aggressive child is somewhat handicapped in functioning independently or autonomously as evidenced by the consistently negative though low correlations between aggression and autonomous achievement striving. Finally, the aggressive child who has difficulty controlling his impulses becomes more conflicted and mistrustful in his relation to adults as evidenced by an increasing positive correlation between aggression and dependency conflict from nursery to first grade. This same finding may also reflect that a conflicted relationships between child and adult fails to result in the curbing of aggression. Moreover, dependency conflict has an increasingly devastating effect on the child's ability to function autonomously. This is evidenced by any increasing negative correlation between dependency conflict and autonomous achievement striving from the nursery to the first grade.

We shall now turn to a consideration for the patterning of motivated behavior in the children of our three groups in the first grade. Before we discuss this pattern it is important to anticipate the later finding, namely that dependency motivation and aggression have very little predic-

tive value for later intellectual performance in these children while autonomous achievement striving and dependency conflict had high predictive power for the child's ongoing and later intellectual performance. Returning to patterns of motivational variables, one way analysis of variance were carried out to test differences between groups on each of the four motivational variables presented in Table 9. The three groups differed significantly on autonomous achievement striving ($F = 2.91$, $df = 2/93$, $p<.05$), and on aggression ($F = 4.59$, df 2/93, $p<.05$). Differences between the groups approached significance ($F = 2.91$, $df = 2/93$, $p<.10$) for dependency motivation, and ($F = 2.62$, $df = 2/93$, $p<.10$) for dependency conflict. Looking at the columns in Table 9 it is clear that the children who have been in school longest, that is Group I, is elevated on all expressive measures, namely dependency, aggression, and autonomous achievement striving. Simultaneously, the same children have the lowest score on dependency conflict or the lowest mistrust in their adult environment. In sharp contrast, Group III, which started school latest is depressed on all three motivational variables and is higher than any other group on dependency conflict or mistrust in the adult environment. Group II is high on autonomous achievement striving and takes an intermediate position between Groups I and III on trust in the adult environment. It is not difficult to understand the heightened autonomous achievement striving and greater trust in the adult environment of children who have had one or two years of preschool experience prior to entering first grade. However, the heightened dependency and aggression in the children who had both nursery and kindergarten experience may mean more than simply increased expressiveness and therefore needs to

be examined more closely. The finding of increased dependency demands may mean that these children have developed a closer emotional bond with the teacher which represents a delayed development of what normally occurs earlier in most non-disadvantaged children in our society. This emotional tie provides the teacher with a greater opportunity to reach the child, to socialize him, and to influence him than is possible with the child who has not yet developed such an emotional tie. Thus, heightened dependency might be a positive sign that the child is now more amenable to socialization and to educational influence from the teacher, rather than a sign of fixation at an infantile level of functioning. The same inference can be made with regard to heightened aggression in children who have had nursery experience. Most of these children experience considerable frustration in their daily lives away from the classroom. Therefore, heightened aggression of these children in the classroom may simply mean that they are less inhibited in giving vent to their reactions to a very frustrating life outside the classroom. The positive meaning of this finding for the role of the school in shaping the child's future will be more fully appreciated after having reported one of the writer's most vivid impressions in preschools for deprived lower-class children.

After training teachers to rate children in the areas of dependency, autonomous achievement striving and aggression, the writer encountered considerable resistance from teachers who came from a similar background as their pupils when asked to report incidents of aggression. Time and again, the writer was confronted with the statement that these children did not manifest any aggression. Apparently, some of these teachers were reluctant to either perceive or to permit aggression in these

lower-class, highly deprived children from backgrounds which generated considerable frustration and therefore at least the potential for aggression. The difficulty these teachers had in either perceiving or accepting aggression in their deprived pre-school pupils may have greatly weakened their potential effectiveness as socializers of aggression. By denying or suppressing aggressive behavior in the nursery or kindergarten, the teacher removes the aggression from the classroom, but she also disqualifies herself as an effective agent in modifying the child's ability to cope with hostile and aggressive impulses away from the classroom.

On the basis of this experience, it may be said that the nursery children who manifested more aggression in the first grade were not necessarily less socialized than their peers who separated this area of behavior from the classroom and thereby removed it from the teachers' influence. The stable and intimate relationships which the child with a background of nursery school was able to experience and develop with his teacher had encouraged him to display a much wider range of all behaviors, even if they were undesirable, in the presence of this protective figure whom he had come to trust. In this sense, the heightened manifestations of emotional dependence on the teacher and of aggression represents a delayed, positive development in deprived children, which indicates that these children have become more amenable than their peers to the educational process and to socialization by the school. Together with higher autonomous achievement striving and lower dependency conflict, that is, inhibition in the expression of dependency, these changes represent greater self-confidence and increased trust in the human environment in those children who have had the benefit of nursery experience,

compared to children who were not exposed to the educational process until they entered first grade.

Interrelationships Between Socio-emotional and Intellectual Areas of Functioning

In order to estimate the predictive power of the child's socio-emotional functioning to his intellectual performance we correlated measures of dependency motivation, aggression, autonomous achievement striving and dependency conflict obtained in the first grade with performance on three intelligence tests and in five academic subjects from the first to the fourth grade.

As indicated earlier dependency on teachers and aggression had very weak predictive power for the child's ongoing as well as prolonged intellectual functioning. As can be seen on Table 10 and 11, dependency on teachers was entirely uncorrelated with intellectual performance and academic achievement in boys. Although dependency on teacher also failed to yield any correlations in girls with their performance on the three intelligence tests, this variable had some predictive power for academic achievement for girls (see Table 11). It is interesting to note that this effect on the girls' overall performance in the classroom was delayed to the fourth grade and otherwise was limited to arithmetic. With regard to the latter, it is possible that (in this group of children) the girls who accepted a dependent role had less problems in succeeding in arithmetic tasks. Two comments are indicated with regard to the relationship between dependency in the first grade and delayed overall success in academic achievement in the classroom in the fourth grade: first, early dependency of girls on the teacher in the first grade may have facilitated acceptance and internalization of the expectations of the educational situation

which resulted eventually in greater and more successful efforts in academic achievement; second, the finding of this delayed effect highlights the importance of longitudinal research in studies of the impact of early educational intervention.

The relationships between aggression and intellectual functioning were also generally weak. (See Tables 12 and 13). However, there were two exceptions. While aggression was unrelated to the performance of girls on the Stanford-Binet Tests and the Peabody Picture Vocabulary Test, it correlated consistently negatively with their performance on the Draw-a-Man Test (See Table 12). This finding suggests that aggression in these girls may well have had a negative effect in their perception of people and of themselves. There is no relationship between aggression and performance on the three intelligence tests in boys. However, with regard to academic achievement, aggression seems to have just as delayed an effect in boys as dependency had in girls since aggression of boys in the first grade is negatively correlated with academic achievement in the fourth grade and not before that time. (See Table 13). Thus, in boys, early aggression may interfere with internalization and later acceptance of the demands of the educational situation. Again, this finding underlines the importance of longitudinal research in impact studies.

When we turn to autonomous achievement striving in the first grade, we find a strong consistent and pervasive relationship of this motivational variable with all measures of intellectual achievement from the first to the fourth grade in both girls and boys (see Rables 14 and 15). The predictive power of autonomous achievement striving is particularly consistent for boys to their performance on the three intelligence tests,

especially the Stnaford-Binet, and in all children to their academic success in the classroom from the first to the fourth grade. However, we encountter once more a somewhat delayed effect, and this time for girls to their performance on intelligence tests which emerges most strongly in the third and fourth grade.

Dependency conflict in the first grade is also a powerful predicter for the child's ongoing and continued intellectual performance from the first to the fourth grade. (see Tables 16 and 17). However, dependency conflict correlates negatively with intellectual performance and academic achievement. The correlations between dependency conflict or mistrust and performance on the three intelligence tests from the first to the fourth grade are much stronger and more consistent in boys than for girls. Generally, dependency conflict correlates more strongly with academic achievement than with performance on intelligence tests. (See Tables 16 and 17). Although the negative correlation between dependency conflict and academic achievement are somewhat stronger for boys than for girls, they are significant and consistent over time with all academic subjects for both sexes. These findings leave little doubt that motivation and socio-emotional factors in the relationship between the child and his teachers have a profound and prolonged effect on the intellectual performance and academic achievement of disadvantaged children.

We shall now turn to one of the most important findings in the present study, namely, the interacting effect of one of the motivational variables with the impact of early educational intervention on the intellectual functioning of the child. Children were divided above and below median on autonomous achievement striving in the first grade. Comparisons

were then carried out separately between the three entrance groups among the high and low autonomous children. The outcome of these comparisons are presented in Figures 4 and 5. It is clear from these figures that early educational intervention has a quite different effect on the disadvantaged child depending on whether he is high or low on autonomous achievement striving. Children who were high on autonomous achievement striving in the first grade showed no differential effect in their performance from first to fourth grade on either the Stanford-Binet or the Peabody Picture Vocabulary Test. In other words, high autonomous achievement children who did not start school until kindergarten or first grade continued to perform as well as those who had the nursery experience both on the Stanford-Binet and on the Peabody Picture Vocabulary Test. A radically different picture emerged for children who were low on autonomous achievement striving at the outset. The low autonomous child was greatly handicapped in his intellectual functioning as a result of not having had the nursery experience and most handicapped when he had neither nursery nor kindergarten experience. (See Figures 4 and 5). The difference between the three low autonomous entrance groups was statistically significant when tested by analysis of variance both on the Stanford-Binet ($F = 5.06$, $df = 2/44$, $p<.05$) and on the Peabody Picture Vocabulary Test ($F = 3.35$, $df = 2/44$, $p<.05$). Another finding which can be seen in Figures 4 and 5 is that the children who had the earliest educational intervention, that is, children in the nursery group, were least affected by their motivational disadvantage since the difference between high and low autonomous children in their performance on the Stanford-Binet and Peabody Picture Vocabulary was both statistically

insignificant and smaller than between any other pair of high and low autonomous entrance groups. In other words, early educational intervention protected these children from the detrimental effects of a motivational handicap which is clearly visible in their peers who did not have the nursery experience.* It is important to note that this interacting effect of motivation and timing of educational intervention was not found for academic achievement in the classroom. In other words, academic achievement in the classroom of both high and low autonomous children was equally affected by the timing of early educational intervention. Since intelligence tests probably constitute a more enduring measure of intellectual ability than daily performance in the classroom this interacting effect of a child's motivation and early educational intervention on later intellectual functioning deserves serious consideration.

The impact of early education intervention on several additional areas of socio-emotional functioning was investigated at the end of the fourth grade. One of the areas assessed was impulse control. Kagan's test for Matching Familiar Figures was used to classify children as reflective or impulsive. As can be seen from Table 18 this test discriminated between entrance groups of boys. Boys with nursery or kindergarten experience had significantly more reflectives than boys who entered school at the first grade. Conversely, boys who entered at the

* Parenthetically, this effect is not accounted for by the relationship between autonomous achivement and intelligence since a similar breakdown between high and low IQ children yielded significant differences between entrance group both in the high and low IQ children.

first grade had significantly more impulsives than boys with preschool experience. The test did not discriminate between entrance groups of girls. Thus, one may conclude that pre-school intervention facilitates reflective attitude towards problem solving in disadvantaged boys and that the effect persists to the end of the fourth grade.

A second area of social functioning assessed in the fourth grade was the maturity of the child's moral judgment. The test employed to assess this area consisted of eighteen stories which had been originally constructed by Piaget and later modified to measure moral realism in children (Seltzer, A., and Beller, E. K., 1969). An analysis of these data by means of Wilcoxon's matched-pairs signed rank test revealed that boys with preschool experience manifested significantly greater maturity of moral judgment than boys who entered school at first grade ($p < .05$). The test did not discriminate significantly between entrance groups of girls. Thus, early educational intervention results in eventual greater maturity of moral judgment in boys while no such effect is found in girls.

The third area of socio-emotional functioning dealt with self-concept and was assessed by means of the Piers-Harris Test. The following procedure was used to analyze the responses of children to the eighty different items in the test. Items were selected for comparison between entrance groups on the basis of yielding a difference of 10% or more between any two of the three entrance groups of boys and any two of the three entrance groups of girls. Items which did not meet this criterion were not used for comparisons between the entrance groups. Comparisons were carried out separately for girls and for boys. The findings for girls

are presented in Table 19A, B, and C. Inspection of the items in Table 19A on which the girls who had most preschool experience responded to most frequently yielded a clear, unambiguous profile of a positive self-concept. This is particularly true for the first nineteen items. The last four items on which these children scored high indicate some apprehensiveness particularly in relation to academic achievement and performance. These four items however cannot be said to reflect a negative self-concept. When one moves on to examine the items on which the girls who entered school at kindergarten age responded most frequently a quite different profile emerges. As can be seen in Table 19B there is a sharp contrast and contradiction between the first fourteen items and the last five items. One gets the impression from this profile that these girls have a very insecure basis for their positive self-concept. When we turn to Table 19C which lists the items on which girls who entered school latest responded most frequently a strikingly different profile emerges than that of the girls who had pre-school experience. These girls seem to have an overwhelmingly negative self-concept. Thus, the timing of educational intervention seems to have as marked an effect on the self-concept of the disadvantaged girls as on any other area of their functioning. These pervasive differences appear to reflect the effect of cumulative positive academic experiences in the girls with early educational intervention while the girls who had a belated start without the benefit of preschool experience appeared to have had cumulative negative academic experiences (See Table 4). One need also keep in mind that until most recently success in the educational field has been a realistic prospect only for the lower class black girl while her male counterpart

had very little if any reason to look for success in the area of learning or academic professions. If this reasoning is accurate, as the present writer believes it to be, the very different effect of early educational intervention of the boys in the present study becomes more meaingful and more easily understandable.

When we turn to Table 20A we find that boys who benefited from early educational intervention of both nursery and kindergarten presented more differentiated and realistic self-concept rather than the generalized positive self-concept we found in the nursery girls (see Table 19A). The first five items reflect a positive self-concept, an acceptance of self, a preference for one's own group and its values such as music, and for an active participation in the group. The second five items (6-10) are negative but they occur much less frequently than the first five items. In fact one gets the impression that some of the items in this second cluster are responded to more realistically by these boys than for example by the boys who had no preschool experiences and who almost completely deny some of these items as applying to themselves. One might say the opposite applies to the third cluster of five items, i.e., 11-15. These items represent superficial stero-typed positive characteristics which are responded to with much greater reservation by the nursery boys than others who did not have the benefit of this early educational intervention. The same may be said with regard to the last five items of Table 20A. These items were also responded to with more hesitation by the nursery boys than by the other two groups who appeared to be quite unrealistic in their almost uncritical

acceptance and claim to self-application of these items. Thus what emerges for the nursery boys is a differentiated reserved and more realistic self-concept than in the boys of the other two entrance groups.

When we turn to Table 20B we find that the boys who entered school at kindergarten like their female counterpart present a sharply contradictory self-image. The first eleven items are not only very positive but show uncritical acceptance of stereo-typed characteristics such as having nice hair, a pleasant face, and being good looking. However, when we inspect responses to the last six items we find that a strong dislike of school, a contradiction of the earlier "my friends like my ideas" by the later statement "my classmates don't think I have good ideas" and altogether a strong feeling of rejection which puts into question the acceptance of earlier statements by the same boys indicating acceptance by peers and family. It almost seems that these boys have had enough of a head start to aspire to success but lack the emotional basis for supporting such aspirations.

Finally, Table 20C which deals with statements responded to most oftenly by boys who did not have the benefit of any preschool experience reveals a more passive self-concept in which denial and defensiveness play a mojor role. For example the first ten items give the impression of an attitude "everything will be alright, don't worry". This is

particularly true of items such as "I am a good person, I don't think bad thoughts, I sleep well at night, I do not want my own way, and I'm not different from other people." These are not positive assertive self characteristics. This impression is further supported by the acceptance of such negative items as "I am unlucky, I worry a lot, I am not strong, in games and sports I watch instead of play." This profile is certainly not as devastatingly negative as the profile of the girl counterpart who also did not have the benefit of any preschool education. Thus, one might conclude while early educational intervention has a simpler, more permeating effect on the self-concept of the lower class disadvantaged girl the benefit of preschool education is more complex but no less marked in its effect on disadvantaged lower class boys.

Summary and Conclusions

The present study investigated immediate and prolonged effects of early educational intervention on a broad spectrum of socioemotional and intellectual functioning in disadvantaged children. The study focused particularly on the interplay of socioemotional and intellectual factors in the educational process in order to throw light on such questions as: who benefits from early educational intervention and why do some children benefit more than others?

We examined children who entered school at four, five and six years of age. We did not attempt to find out why some children entered school earlier and others later. We did however take pains to match the different groups on relevant variables such as age, sex, social class and ethnic identity. We also accomplished almost total equality between the three entrance groups on the level of their intellectual competence as measured by different tests when they entered the educational programs. Thus, we do feel that our entrance groups were well matched on relevant and important variables at the onset of educational intervention. More importantly, because of our concern for the question of who benefits from early educational intervention, we concentrated as much on comparisons between children within entrance groups as on comparisons between entrance groups. We found a good deal of evidence for both immediate, delayed and prolonged effects of early educational intervention. We also found a series of factors

such as a child's sex, motivational level and trust in the teacher, which affected both the impact of the timing of educational intervention or when a child started school, and how much he benefited regardless of whether he starts at four, five or six years of age. Notwithstanding the importance of our first set of findings, namely, that the timing of educational intervention in early childhood had immediate and prolonged effects on a wide range of the child's socio-emotional and intellectual functioning, our second set of findings, namely, the interplay of motivational, socio-emotional and intellectual processes helped us understand the former and provided specific and useful information for future educational planning.

The timing of intervention had a direct effect on the patterning of those motivational and socio-emotional variable which proved to be essential in the socialization of orientations toward intellectual competence and academic achievement. One of these motivational variables, namely, level of autonomous achievement striving, while itself affected by early educational intervention acted also as an important indicator of which children suffered most and which least from the lack of preschool experience. Finally the child's sex was an important monitor of the impact of early educational intervention. Timing of early intervention had a more marked, consistent and uniform effect on girls in their academic achievement and self concept. For girls, dependency on teachers had a positive effect on the socialization of academic

achievement while aggression had the opposite effect in this regard on boys. Preschool experience had a direct and consistent effect only on boys in reflective-impulsive reactions to intellectual tasks and maturity of moral judgments. Early mistrust of teachers affected boys more consistently than girls in their readiness to benefit from educational experiences.

These findings suggest strongly that it might be more fruitful to channel future research to find answers to the question: which children benefit more than others from early educational intervention than to such questions as: Is preschool education necessary? or Does preschool education help disadvantaged children?

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TABLE 1

AVERAGE AGES (IN MONTHS) ($\overline{CA}$), STANDARD DEVIATIONS (SD) OF BOYS AND GIRLS ENTERING SCHOOL AT NURSERY, KINDERGARTEN, AND FIRST GRADE

CHILDREN	TIME OF ENTRANCE								
	Nursery			Kindergarten			First Grade		
	N	$\overline{CA}$	SD	N	$\overline{CA}$	SD	N	$\overline{CA}$	SD
Boys	32	56.2	4.1	29	70.9	2.0	27	82.8	3.9
Girls	26	56.1	3.1	24	70.9	3.0	30	84.2	5.6
Total	58	56.2	3.7	53	70.4	2.5	57	83.6	4.9

TABLE 2

MEAN SCORES ON THREE MEASURES OF INTELLIGENCE (STANFORD BINET TEST, GOODENOUGH DRAW-A-MAN TEST, AND THE PEABODY PICTURE VOCABULARY TEST) FOR THREE GROUPS OF CHILDREN (GROUP I HAD NURSERY AND KINDERGARTEN, GROUP II HAD KINDERGARTEN ONLY AND GROUP III HAD NEITHER NURSERY NOR KINDERGARTEN) ON FIVE GRADE LEVELS.

		GRADE TESTED									
TIME OF ENTRANCE	N	NURSERY	N	KINDER GARTEN	N	FIRST GRADE	N	SECOND GRADE	N	THIRD GRADE	N	FOURTH GRADE
Stanford Binet												
Nursery	(57)	92.1	(56)	98.6	(53)	98.4	(52)	97.8	(51)	97.6	(50)	98.4
Kindergarten			(53)	91.2	(53)	94.4	(50)	92.8	(46)	93.1	(46)	91.7
First Grade					(57)	89.9	(55)	88.6	(53)	89.3	(53)	88.6
Peabody Picture Vocabulary												
Nursery	*		(51)	84.8	(47)	89.5	(52)	88.6	(49)	90.3	(50)	91.8
Kindergarten			(52)	80.7	(53)	85.4	(50)	88.9	(46)	89.1	(46)	88.1
First Grade					(57)	82.4	(55)	84.1	(53)	84.8	(52)	84.9
Draw-A-Man												
Nursery	(56)	97.6	(55)	96.2	(51)	99.6	(52)	94.9	(50)	93.7	(50)	94.3
Kindergarten			(53)	96.8	(53)	98.6	(50)	96.6	(46)	91.7	(46)	91.6
First Grade					(57)	98.3	(55)	92.2	(53)	87.2	(53)	85.6

* Peabody Picture Vocabulary Test was not given on the nursery level

TABLE 3

DECLINE IN DAM IQ OVER GRADES 1 THROUGH 4 IN THREE GROUPS OF CHILDREN (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE).

ENTERING GROUP	N[a]	r[b]	p
I	203	-.12	NS
II	195	-.17	<.05
III	218	-.30	<.01

a. N is the number of IQ scores in a group, pooled across first through fourth grade testing.

b. r is the correlation between grade level, (first through fourth) and IQ.

TABLE 4

AVERAGE MARKS FOR THREE GROUPS OF GIRLS (GROUP I = ENTERING NURSERY, GROUP II= ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE) IN ARITHMETIC, READING, SPELLING, SCIENCE, AND SOCIAL STUDIES FROM FIRST TO FOURTH GRADE

TIME OF ENTRANCE GROUPS	N	GRADES 1st	2nd	3rd	4th	AVERAGE
			ARITHMETIC			
I	(19)	54.96	53.62	55.13	50.87	53.64
II	(17)	53.12	51.20	51.29	50.45	51.52
III	(18)	47.72	46.99	48.21	47.93	47.93
			READING			
I	(19)	55.66	55.13	54.82	51.78	54.35
II	(17)	53.49	51.02	52.14	49.57	51.55
III	(18)	48.98	44.75	44.23	47.44	46.35
			SPELLING			
I	(17)		4.12	3.94	4.00	4.02
II	(16)		3.56	3.88	3.88	3.77
III	(17)		2.82	2.94	3.00	2.92
			SCIENCE			
I	(17)		3.65	3.53	3.41	3.53
II	(16)		3.31	3.19	2.94	3.14
III	(19)		2.65	3.24	2.94	2.94
			SOCIAL STUDIES			
I	(19)		3.76	3.35	3.59	3.57
II	(16)		3.38	3.31	3.25	3.31
III	(17)		2.88	3.12	3.00	3.00

TABLE 5

AVERAGE MARKS FOR THREE GROUPS OF BOYS (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE) IN ARITHMETIC, READING, SPELLING, SCIENCE, AND SOCIAL STUDIES FROM FIRST TO FOURTH GRADE

TIME OF ENTRANCE GROUPS	N	GRADES 1st	2nd	3rd	4th	AVERAGE
			ARITHMETIC			
I	(21)	54.28	52.67	51.74	48.64	51.83
II	(17)	56.49	55.20	54.43	48.87	53.75
III	(14)	46.90	51.86	48.77	48.64	49.04
			READING			
I	(21)	49.88	52.78	51.27	47.43	50.34
II	(17)	54.16	55.22	54.79	51.90	54.02
III	(14)	45.04	49.67	50.43	46.49	47.91
			SPELLING			
I	(21)		3.57	3.48	3.05	3.36
II	(19)		4.00	3.78	3.58	3.79
III	(13)		2.92	2.52	2.69	2.71
			SCIENCE			
I	(21)		3.43	3.24	3.14	3.27
II	(19)		3.74	3.58	3.63	3.65
III	(13)		3.08	3.23	3.08	3.13
			SOCIAL STUDIES			
I	(21)		3.52	3.24	3.33	3.36
II	(19)		3.79	3.58	3.47	3.61
III	(13)		3.15	3.00	2.77	2.97

TABLE 6

RATINGS OF PUPIL ATTITUDES IN FIRST AND SECOND GRADE FOR THREE GROUPS OF CHILDREN (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE)

ATTITUDES	GROUP	FREQUENCIES (BEST)	FREQUENCIES (WORST)	CHI SQUARE	DF	P
IN FIRST GRADE						
1. Best vs. worst attitude toward study and learning	I	9	2	9.07	2	.05
	II	4	5			
	III	1	7			
2. most positive vs. most negative attitude toward school	I	6	2	6.01	2	.05
	II	6	2			
	III	3	8			
3. most vs. least popular among other children	I	5	8	2.70	2	N.S.
	II	5	2			
	III	3	6			
IN SECOND GRADE						
1. best vs. worst attitude toward study and learning	I	17	4	8.88	2	.05
	II	12	5			
	III	8	13			
2. most positive vs. most negative attitude toward school	I	15	9	6.20	2	.05
	II	13	4			
	III	6	11			
3. most vs least popular among other children	I	12	9	1.12	2	N.S.
	II	5	5			
	III	5	8			

TABLE 7

RATINGS OF REACTIONS TO BEING TESTED ON INTELLIGENCE TESTS IN THREE GROUPS OF CHILDREN (GROUP I = ENTERING NURSERY, GROUP II = ENTERING KINDERGARTEN, GROUP III = ENTERING FIRST GRADE) FROM FIRST THROUGH THIRD GRADE

ENTRANCE GROUPS	N	GRADES 1st	2nd	3rd	AVERAGE
(7) COOPERATIVE TO RESISTANT (1)					
I	29	5.5	5.6	5.2	5.4
II	42	5.5	5.5	5.5	5.5
III	49	5.1	4.4	4.4	4.6
(7) INVOLVED TO UNINVOLVED (1)					
I	29	4.7	4.6	4.6	4.7
II	42	5.1	4.5	4.5	4.7
III	49	4.2	3.8	3.9	3.9
(7) PERSISTANT TO NONPERSISTANT (1)					
I	29	3.8	4.2	3.9	4.0
II	42	4.2	4.0	4.4	4.1
III	49	3.4	3.3	3.5	3.4
(7) RIGID TO FLEXIBLE (1)					
I	29	4.2	4.0	4.3	4.2
II	42	4.2	3.6	3.7	3.8
III	49	4.2	4.3	4.8	4.1
(7) RELAXED TO TENSE (1)					
I	29	4.1	4.7	4.0	4.3
II	42	4.2	4.5	4.2	4.3
III	49	3.7	3.9	3.8	3.8

TABLE 8

INTERCORRELATIONS BETWEEN MOTIVATIONAL MEASURES IN NURSERY, KINDERGARTEN AND FIRST GRADE

MOTIVATION	NURSERY (N = 175)			KINDERGARTEN (N = 93)			FIRST GRADE (N = 96)		
	1	2	3	1	2	3	1	2	3
1. Dependency									
2. AAS#	-.32**			-.03			-.03		
3. Aggression	.41**	-.38**		.56**	-.19		.33**	-.20	
4. Dependency Conflict	-.17*	-.34**	.08	-.09	-.50**	.25*	-.07	-.70**	.30**

AAS = Autonomous Achievement Striving

TABLE 9

AVERAGE MOTIVATIONAL MEASURES FOR
THREE GROUPS OF FIRST GRADE CHILDREN

(Group I=entered Nursery, Group II=entered
Kindergarten, Group III=entered First Grade

Motivational Measures	Group I (N=31)	Group II (N=28)	Group III (N=37)
Dependency	4.30	3.56	3.72
AAS †	4.35	4.29	3.41
Aggression	4.54	3.56	3.44
Dependency-Conflict	3.55	3.95	4.25

† =Autonomous Achievement Striving(AAS)

TABLE 12

PREDICTIVE CORRELATIONS MEASURES OF AGGRESSION OBTAINED IN FIRST GRADE WITH THREE SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM 1ST TO 4TH GRADE FOR BOYS+ AND GIRLS+

TESTS	GRADES			
	1st	2nd	3rd	4th
		BOYS		
Binet	.08	.15	.03	.06
DAM#	.02	-.18	.06	.17
PPVT#	.21	.04	.10	.12
		GIRLS		
Binet	-.04	.03	-.06	-.07
DAM#	-.32*	-.44**	-.39*	-.32*
PPVT#	-.16	-.16	-.04	-.13

+ For boys, N = 46 to 53
For girls, N = 38 to 43

# DAM = Draw-a-Man Test
PPVT = Peabody Picture Vocabulary Test

* $p \leq .05$

** $p \leq .01$

TABLE 13

PREDICTIVE CORRELATIONS OF MEASURES OF AGGRESSION OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS IN FIVE SUBJECT AREAS FROM 1ST TO 4TH GRADES FOR BOYS+ AND GIRLS+

SUBJECTS	GRADES			
	1st	2nd	3rd	4th
			BOYS	
Arithmetic	.18	-.06	-.16	-.46**
Reading	-.08	.12	.02	-.27
Spelling		-.02	-.04	-.18
Science		.02	.08	-.35*
Social Studies		.04	-.06	-.32
			GIRLS	
Arithmetic	-.07	.11	-.04	-.05
Reading	-.12	.01	-.14	-.09
Spelling		-.20	-.15	-.02
Science		-.24	-.12	-.10
Social Studies		-.17	-.21	-.06

+ For Boys, N = 34 to 50
For girls, N = 28 to 38

* $p \leq .05$
** $p \leq .01$

TABLE 14

PREDICTIVE CORRELATIONS MEASURES OF AUTONOMOUS ACHIEVEMENT STRIVING OBTAINED IN FIRST GRADE WITH THREE SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM 1st TO 4th GRADE FOR BOYS+ AND GIRLS+.

TESTS	GRADES			
	1st	2nd	3rd	4th
		BOYS		
Binet	.54**	.65**	.62**	.58**
DAM#	.43**	.52**	.34*	.30*
PPVT#	.39**	.41**	.37**	.45**
		GIRLS		
Binet	.29	.39*	.45**	.42**
DAM#	.30*	.31	.46**	.40**
PPVT#	.17	.24	.33*	.48**

\+ For boys, N = 46 to 53
For girls, N = 38 to 43

\# DAM = Draw-A-Man Test
PPVT = Peabody Picture Vocabulary Test

* $p \leq .05$

** $p \leq .01$

TABLE 15

PREDICTIVE CORRELATIONS OF MEASURES OF AUTONOMOUS ACHIEVEMENT STRIVING OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS+ IN FIVE SUBJECT AREAS FROM 1ST TO 4TH GRADES FOR BOYS+ AND GIRLS+

SUBJECTS	GRADES			
	1st	2nd	3rd	4th
		BOYS		
Arithmetic	.66**	.73**	.78**	.57**
Reading	.59**	.70**	.75**	.57**
Spelling		.66**	.61**	.64**
Science		.68**	.33*	.70**
Social Studies		.68**	.51**	.51**
		GIRLS		
Arithmetic	.76**	.74**	.72**	.55**
Reading	.46**	.74**	.67**	.51**
Spelling		.73**	.78**	.60**
Science		.65**	.36*	.56**
Social Studies		.63**	.39*	.58**

+ For boys, N = 34 to 50
For girls, N = 28 to 38

** $p \leq .01$
* $p \leq .05$

TABLE 16

PREDICTIVE CORRELATIONS MEASURES OF DEPENDENCY CONFLICT OBTAINED IN FIRST GRADE WITH THREE SCORES ON THREE TESTS OF INTELLECTUAL FUNCTIONING FROM 1st TO 4th GRADE FOR BOYS+ AND GIRLS+

TESTS	GRADES			
	1st	2nd	3rd	4th
BOYS				
Binet	-.47**	-.54**	-.58**	-.59**
DAM#	-.37**	-.42**	-.27	-.23
PPVT#	-.35**	-.34*	-.38*	-.40**
GIRLS				
Binet	-.32*	-.39*	-.20	-.23
DAM#	-.18	-.32*	-.12	-.18
PPVT#	-.11	-.07	-.16	-.28

\+ For boys, N = 46 to 53
For girls, N = 38 to 43

\# DAM = Draw-A-Man Test
PPVT = Peabody Picture Vocabulary Test

* $p \leq .05$

** $p \leq .01$

TABLE 17

PREDICTIVE CORRELATIONS OF MEASURES OF DEPENDENCY CONFLICT OBTAINED IN FIRST GRADE WITH ACADEMIC ACHIEVEMENT BASED ON MARKS IN FIVE SUBJECT AREAS FROM 1ST TO 4TH GRADES FOR BOYS+ AND GIRLS+

SUBJECTS	GRADES			
	1st	2nd	3rd	4th
			BOYS	
Arithmetic	-.52**	-.57**	-.60**	-.41**
Reading	-.46**	-.56**	-.56**	-.47**
Spelling		-.48**	-.47**	-.46**
Science		-.56**	-.32**	-.55*
Social Studies		-.54**	-.48**	-.43*
			GIRLS	
Arithmetic	-.36*	-.38*	-.42**	-.22
Reading	-.27	-.46**	-.47**	-.38*
Spelling		-.46**	-.34*	-.33*
Science		-.49**	-.40*	-.37*
Social Studies		-.54**	-.42**	-.40*

+ For boys, N = 34 to 50
For girls, N = 28 to 38

** $p \leq .01$
* $p \leq .05$

TABLE 18

DISTRIBUTIONS OF REFLECTIVES AND IMPULSIVES+ IN THREE GROUPS OF CHILDREN

(Group I=entered Nursery, Group II=entered Kindergarten, Group III=entered First Grade)

Entrance Groups	Boys		Girls	
	Reflectives	Impulsives	Reflectives	Impulsives
I	15	6	5	9
II	14	6	8	3
III	4	13	7	13
	$x^2=10.92$ df=2 $p < .01$		$x^2=4.71$ df=2 $p < .10$	

+ = Based on Kagan Test for Matching Familiar Figures

TABLE 19A

HIGH PERCENTAGE RESPONSES OF NURSERY GIRLS TO SELF CONCEPT ITEMS

Questions	Groups[1] Nursery (N=22)	Kinder-garten (N=20)	First Grade (N=29)
1. I am cheerful (52)[2]	91	85	72
2. I am not clumsy (64)	91	80	72
3. In games and sports I play instead of watch (65)	77	65	52
4. When I try to make something, everything does not seem to go wrong (61)	77	55	59
5. It is not usually my fault when something goes wrong (13)	73	50	59
6. I do not lose my temper easily (68)	59	40	45
7. I do not think bad thoughts (78)	100	85	72
8. I am well behaved in school (12)	95	80	76
9. I do not behave badly at home (25)	86	85	69
10. I often volunteer in school (42)	100	95	76
11. I do not usually want my own way (39)	77	65	55
12. I am not unpopular (11)	82	65	66
13. I am popular with boys (57)	41	30	14
14. I have many friends (51)	100	90	90
15. It is not hard for me to make friends (3)	91	70	72
16. I do not pick on my brothers and sisters (32)	91	75	59
17. I am an important member to my family (17)	73	45	69
18. My family is not disappointed in me (59)	91	80	83
19. When I grow up I will be an important person (9)	95	85	76
20. I am shy (6)	59	55	41
21. I am nervous (28)	50	30	28
22. I get nervous when my teacher calls on me (7)	45	30	31
23. I get worried when we have tests (10)	73	45	59

[1] Grouping based on year entering school.

[2] ( ) Original item numbers indicating position in the test.

TABLE 19B

HIGH PERCENTAGE RESPONSES OF KINDERGARTEN GIRLS TO SELF CONCEPT ITEMS

Questions	Groups† Kinder-garten (N=20)	Nursery (N=22)	First Grade (N=29)
1. I am smart (5)†	85	73	72
2. I am not always dropping and breaking things (75)	80	73	55
3. I am good in making things with my hands (19)	85	68	66
4. I am a good reader (70)	90	77	79
5. I can give a good report in front of the class (30)	90	73	76
6. I have a pleasant face (43)	70	55	62
7. I am not unhappy (50)	85	73	72
8. I do not cry easily (76)	80	68	66
9. I do not worry a lot (37)	65	55	41
10. My friends like my ideas (33)	100	86	72
11. My classmates think I have good ideas (49)	90	50	66
12. I am a leader in games and sports (63)	60	27	38
13. I am not different from other people (77)	75	55	48
14. I do not wish I were different (60)	95	64	66
15. In school I am a dreamer (31)	45	32	17
16. I hate school (45)	20	9	10
17. I cannot draw well (23)	30	18	14
18. I am not an important member of my class (27)	60	50	50
19. I feel left out of things (40)	45	32	38

† Grouping based on year entering school.

† ( ) Original item numbers indicating position in the test.

TABLE 19C

HIGH PERCENTAGE RESPONSES OF FIRST GRADE GIRLS TO SELF CONCEPT ITEMS

Questions	Groups† First Grade (N=29)	Nursery (N=22)	Kinder-garten (N=20)
1. I cause trouble to my family (14)†	24	9	10
2. I am always dropping or breaking things (75)	45	27	20
3. I am clumsy (64)	28	9	20
4. I am unlucky (36)	48	36	40
5. I am not strong (15)	69	55	40
6. I don't have lots of pep (55)	52	32	25
7. I worry a lot (37)	59	45	35
8. I am not cheerful (52)	28	5	15
9. I am not a happy person (2)	27	5	15
10. My looks bother me (8)	31	18	5
11. I am unpopular (11)	34	18	35
12. I am not popular with boys (57)	86	59	70
13. I am not popular with girls (69)	28	9	10
14. It is hard for me to make friends (3)	28	9	30
15. My friends don't like my ideas (33)	28	14	0
16. I am among the last to be chosen for a game (46)	59	41	40
17. People pick on me (58)	45	32	25
18. I get into a lot of fights (56)	33	14	25
19. I have bad thoughts (78)	28	0	15
20. I dislike my brother (72)	34	18	15
21. I pick on my brothers and sisters (32)	41	9	25
22. I behave badly at home (25)	31	14	15
23. My parents do not expect too much of me (38)	24	41	35
24. In games and sports I watch instead of play (65)	48	23	35
25. When I grow up I will not be an important person (9)	24	5	15
26. I do not volunteer in school (42)	24	0	5
27. In school I am not a dreamer (31)	17	32	45
28. I am not shy (6)	41	39	55

† Grouping based on year entering school.

† ( ) Original item numbers indicating position in the test.

TABLE 20A

HIGH PERCENTAGE RESPONSES OF NURSERY BOYS TO SELF CONCEPT ITEMS

Questions	Groups[1] Nursery (N=27)	Kinder-garten (N=23)	First Grade (N=22)
1. I am cheerful (52)[2]	81	74	73
2. I like being the way I am (18)	96	83	86
3. I am good in music (24)	85	74	68
4. I'd rather work in a group than alone (71)	67	57	55
5. In games, I'd rather play than watch (65)	78	61	50
6. I wish I were different (60)	44	26	23
7. I do many bad things (22)	33	22	14
8. I am not a leader in games and sports (63)	59	39	45
9. I often get into trouble (34)	52	39	32
10. I lose my temper easily (68)	56	35	32
11. I have pretty eyes (29)	37	69	59
12. I have a pleasant face (43)	44	78	64
13. I have nice hair (41)	52	91	59
14. I am good looking (54)	52	83	59
15. I am popular with girls (69)	37	57	59
16. When I grow up I will be an important person (9)	81	91	91
17. I am good in my school work (21)	74	91	91
18. I can give a good report in front of the class (30)	74	83	82
19. My friends like my ideas (33)	70	83	77
20. I am a leader in games and sports (63)	41	61	55

[1] Grouping based on year entering school

[2] ( ) Original item numbers indicating position in the test.

TABLE 20B

HIGH PERCENTAGE RESPONSES OF KINDERGARTEN BOYS TO SELF CONCEPT ITEMS

Questions	Groups† Kindergarten (N=23)	Nursery (N=27)	First Grade (N=22)
1. I am smart (5)‡	87	70	77
2. I am strong (15)	83	70	59
3. I have nice hair (41)	91	52	59
4. I have a pleasant face (43)	78	44	64
5. I am good looking (54)	83	52	59
6. I am a good reader (70)	91	74	73
7. My friends like my ideas (33)	83	70	77
8. I am not disobedient at home (35)	83	74	73
9. I am not slow in finishing my school work (26)	78	67	55
10. It is usually not my fault when something goes wrong (13)	83	59	64
11. I am not always dropping or breaking things (75)	83	67	68
12. I hate school (45)	26	15	18
13. In school I am a dreamer (31)	48	30	27
14. My classmates don't think I have good ideas (49)	48	37	27
15. My family is disappointed in me (59)	26	15	14
16. I am not popular with boys (57)	39	26	23
17. I feel left out of things (40)	43	33	36

†Grouping based on year entering school.

‡( ) Original item numbers indicating position in the test.

TABLE 20C

HIGH PERCENTAGE RESPONSES OF FIRST GRADE BOYS TO SELF CONCEPT ITEMS

Questions	Groups[1] First Grade (N=22)	Nursery (N=27)	Kinder-garten (N=23)
1. I am a good person (80)[2]	95	81	83
2. I don't think bad thoughts (78)	86	74	74
3. I do not do many bad things (22)	86	67	78
4. I sleep well at night (44)	91	78	74
5. I usually do not want my own way (39)	82	37	61
6. I am not clumsy (64)	86	78	74
7. I am not dumb about most things (53)	91	78	87
8. I am not different from other people (77)	77	48	44
9. I don't wish I were different (60)	77	56	74
10. I am an important member of my class (27)	59	48	44
11. I am unlucky (36)	41	33	39
12. I worry a lot (37)	59	44	43
13. I am not strong (15)	41	30	17
14. I am not good in music (24)	32	15	26
15. I am slow in finishing my school work (26)	45	37	22
16. I get worried when we have tests (10)	59	48	48
17. I dislike my brother (72)	23	11	13
18. I pick on my brothers and sisters (32)	45	19	17
19. In games and sports, I watch instead of play (65)	50	22	39

[1] Grouping based on year entering school.

[2] ( ) Original item numbers indicating position in the test.

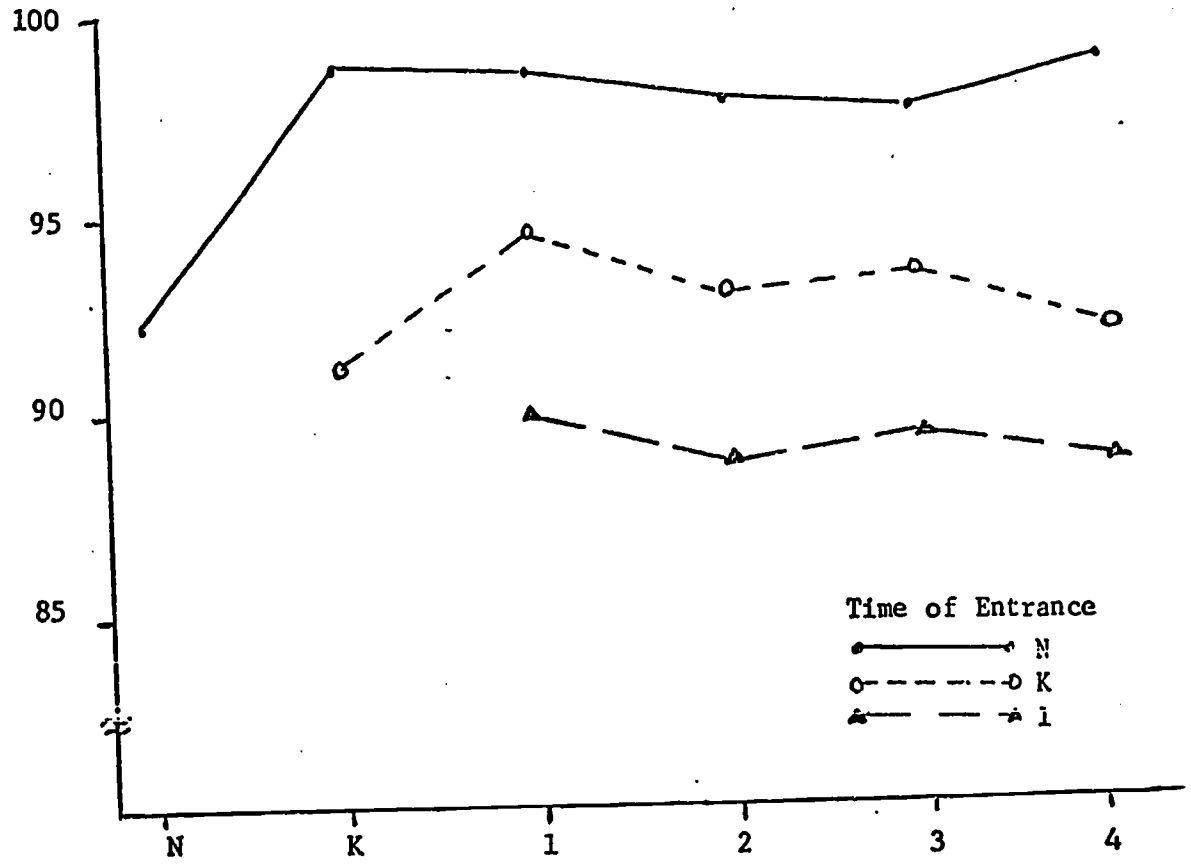

Figure 1 Average Stanford-Binet IQ Scores across grades of groups entering school at Nursery (N), Kindergarten (K), and First Grade (1)

(Sizes of groups ranged from N=46 to N=58)

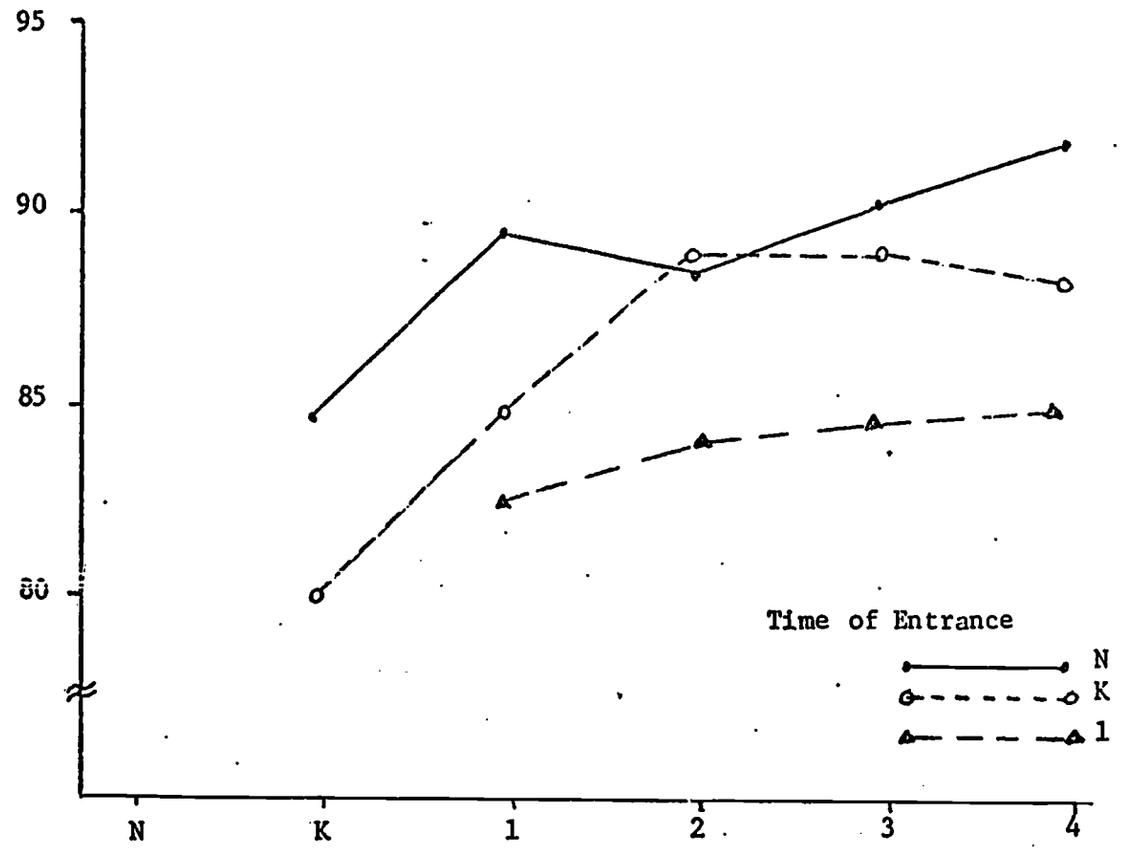

Figure 2 Average Peabody IQ Scores across grades of groups entering school at Nursery (N), Kindergarten(K) and First Grade (1)
(Sizes of groups range from N=46 to N=58)

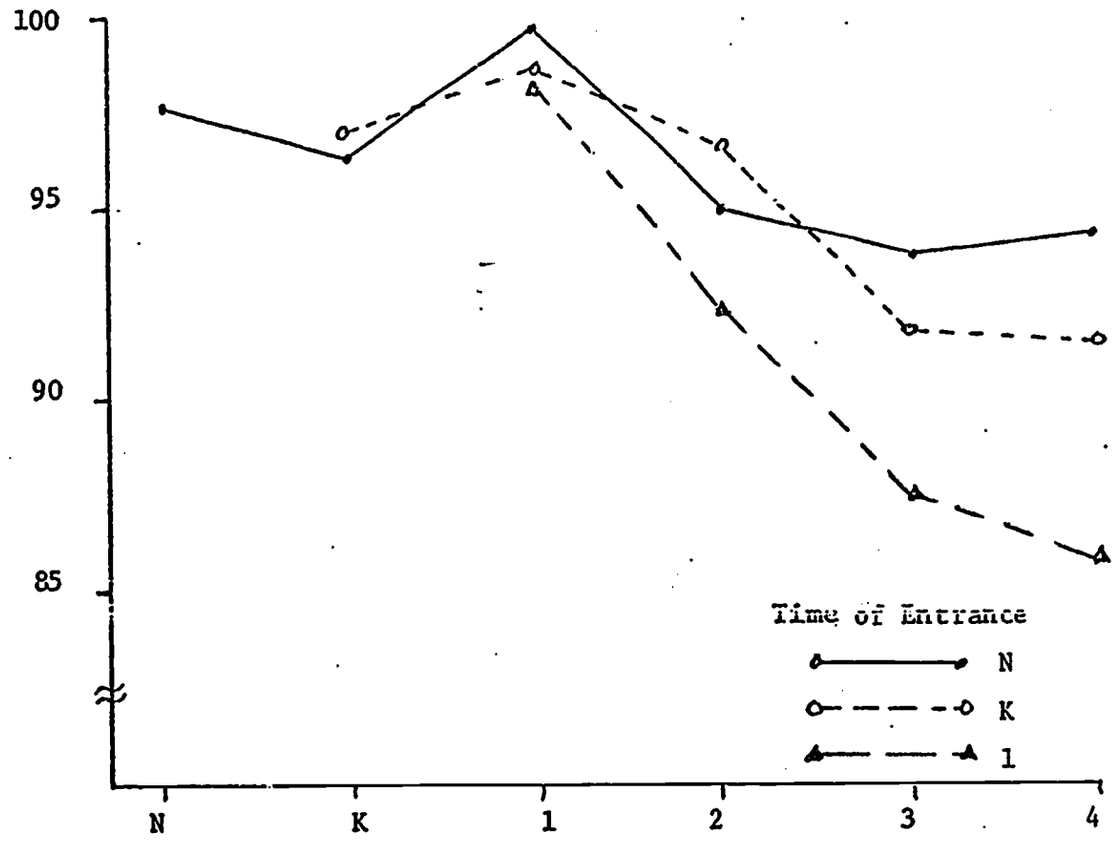

Figure 3 Average Draw-a-Man IQ Scores across grades of groups entering school at Nursery (N), Kindergarten(K) and First Grade (1) (Sizes of groups ranged from N=46 to N=58)

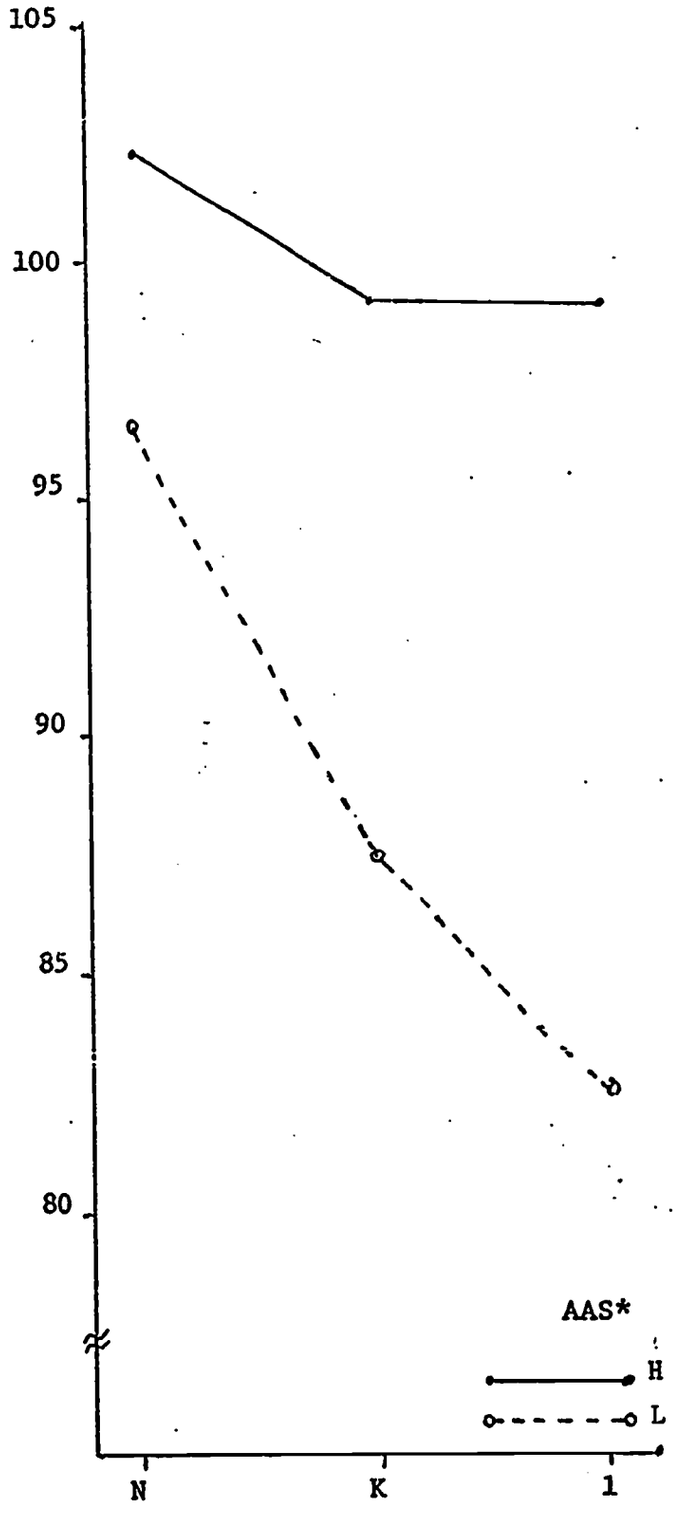

Figure 4 Average Stanford-Binet IQ Scores of high (H) and low (L) autonomous achievement striving (AAS) groups entering school at Nursery (N), Kindergarten (K) and First Grade (1)
(Sizes of groups ranged from N=11 to N=20)

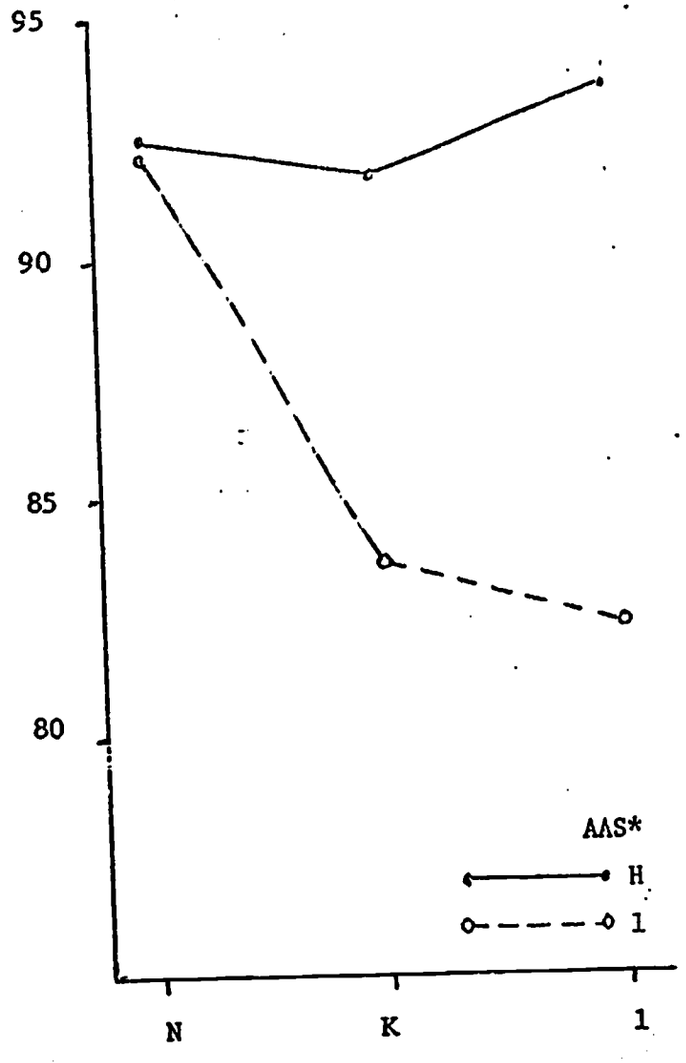

Figure 5 Average Peabody IQ Scores of high (H) and low(L) autonomous achievement striving (AAS) groups entering school at nursery (N), Kindergarten (K) and First Grade (1) (Sizes of groups ranged from N=11 to N=20)

APPENDIX TO
IMPACT OF EARLY EDUCATION
ON DISADVANTAGED CHILDREN

Related Findings

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B. DIRECT OBSERVATION OF DEPENDENCE AND AUTONOMOUS FUNCTIONING IN HEAD START PROGRAMS FOR DISADVANTAGE PRE-SCHOOL CHILDREN

The final part of this report will deal with a study in which we have tried to clarify and validate some of the major findings and conclusions which have been presented in the preceding parts of this paper.

In our longitudinal study we have attributed gains in intellectual achievement and superiority of some children over others to length of educational experience. These findings were based on comparisons between groups which permitted a good deal of overlap with regard to the dependent variable, namely gain or superiority in intellectual achievement. In the new study, we have carefully divided children in a Head Start Program on the basis of changes in their test results from the beginning and towards the end of the program into three groups: a group of children who had gained, a second group who had failed to change, and a third group who lost in I.Q. points. There was no overlap on this particular variable between the three groups of children.

Another clarification and refinement which the new study attempted, had to do with the variables of dependency and autonomy. In our longitudinal study, we distinguished between dependency motivation nad dependency conflict. Measures of dependency motivation which failed to relate to intellectual finctioning, did not make a distinction between instrumental and emotional dependency. In our new study, we attempted to make this distinction and expected that our new measure of emotional dependency would behave very much like our earlier measure of dependency motivation, that is, it would fail to relate to intellectual achievement. However, our new measure of instrumental dependency was expected to behave more like our measure of dependency conflict and reflect the child's trust in his environment nad his readiness to make use of available help. If a child requests help, because he cannot do something by himself, it does not reflect dependency motivation or helplessness on the child's part. Conversely, if a child who fails

to seek help for something he wants to do but cannot do by himself, it indicates inhibition or conflict over seeking help rather than low dependency motivation. Therefore, the measure of instrumental and realistic dependence was expected to relate to a child's ability to gain from the educational program in Head Start. Altogether, the detailed, sequential interaction of the child with his teacher which was unexplored in our earlier study was to be investigated more intensively through direct observation in our new study. The general notion of this detailed interaction between a child and his teacher was what the child demands of the teacher, how the teacher responds to the child's initiation, how the teacher's response affects the child's behavior and how the child copes with the teacher's failure to respond to his demands in a positive and supportive way. Of course, the overall objective was to relate these detailed steps in the sequential interaction between the child and his teacher to the child's readiness to gain from the educational experience in Head Start or Get Set Nursery programs.

Another major concern of the new study dealt with clarification of our findings with regard to the role of autonomous achievement striving in the intellectual development of the child. Two clarifications were attempted in the new study. The first dealt with the continued role of the environment as a reinforcer of the child's self-sufficiency. Unless a child is autistic, it is reasonable to assume that his ability to function by himself and to derive gratification from his non-social endeavors and experiences needs and probably even elicits support from his social environment. In other words, autonomy does not grow only from within, but develops through reassuring responsiveness from the environment. In our new study, we attempted to obtain concrete data on this question and relate it to a child's readiness to gain intellectually from the

educational experience in the Get Set Program. The second clarification with regard to autonomy which was attempted in the new study was to obtain a measure of a child's ability to make learning a self-rewarding experience, that is, to learn a cognitive task in which the reinforcement for his learning is derived solely from his own success in the learning process. We have labeled this process "Task Intrinsic Reinforcement." Thus, in that situation autonomous achievement striving is carefully controlled and bears directly on the child's cognitive learning and acquisition of intellectual skills. This situation, which took the form of a learning experiment, was systematically related to a child's readiness or failure to gain from his educational experience in the Get Set Program.

Finally, the new study added two methodological dimensions to our longitudinal research, namely direct non-participant observations instead of participant observer ratings and the use of experiments for assessment of a child's intellectual achievement under carefully controlled motivational conditions.

The present study investigated the relationships between the child's dependency interaction with his teachers and the change in his intellectual functioning after eight monts of Get Set experience. Specifically, the study was designed to test the following hypothesis:

1. Children with a gain in their level of cognitive functioning as a result of participating in Get Set Programs will: a) make more realistic instrumental dependency requests of their teachers than children who fail to gain, b) make more instrumental than emotional dependency demands of their teachers.

2. Children who gain , receive, or elicit more positive reactions than other children from their teachers (to their requests for help),

3. Children who gain make more constructive use than other children of the solicited help and support they receive from their teachers.

4. Children who gain cope mroe effectively than other children with failure to receive solicited help (e.g., they try to solicit help from another adult, they try to carry out the activity by themselves, they shift to a different activity 'versus' less effective forms of coping with failure to receive help, e.g. regression and displaced aggression).

5. Children who gain receive and probably elicit more reinforcement for autonomous goal-directed behaviors from their social environment (e.g. they receive more attention from adults or peers when engaged in autonomous goal-directed behavior).

6. Children who gain will be more successful than other children in learning a problem-solving task under conditions of "intrinsic" reinforcement. This problem-solving situation involved the discovery of a principle in which the child received no other reward or reinforcement than his experiencing a successful outcome of his efforts. The implication of successful learning under this condition of reinforcement is that the child has internalized standards and sources of reward for success in problem-solving situations.*

Thirty-six children were selected from the total Get Set sample of 120 children in Philadelphia studied by the University, Head Start Evaluation and Research Center and groups of 12 children each were matched on the basis of changed scores from the fall and spring administration of Stanford-Binet Tests. The first criterion for selection involved matching pairs of children with equal I.Q. scores on the amount of gain and loss. For example, a child with an initial I.Q. of 90 and a gain of seven points

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*Beller, E.K. and Young, AS Types of Reinforcement and prior experience in Learning of Lower Class Negro Children. Presented at the Annual Meetings of the Eastern Psychological Association, New York City, April, 1966.

Beller, E.K, Motivation, Locus of Reinforcement, and Problem-Solving in Children. Presented at the Annual Meetings of the American Psychological Association, San Francisco, California, 1968.

on the re-test was matched with another child who had an initial I.Q. of approximately 90 but a loss of approximately seven points on the re-test. This was done to overcome the regression effect that was clearly evident in the group as a whole. This procedure resulted in three groups of children, one group (n-13) with gains from four to 18 I.Q. points and a median gain of 10 points, a second group (N=11) with losses from four to 18 I.Q. points and a median loss of nine points, and a third group (N=10) with changes that ranged between a loss and gain of three I.Q. points and a median change of -.5 I.Q. points.

Our measure of I.Q. change was based on two administrations of the Stanford-Binet, one early in the fall of 1966 and the other late in the spring of 1967, with an approximate interval of eight months.

Observational data on dependency sequences in teacher-child interactions were obtained through six consecutive 15-minute observations in two situations of the daily education program in Get Set.

The two situations were free-play and free-work periods. One of these situations occurred at the beginning of the nursery day, and the second took place prior to lunch. A stratified, randomized design was used to assign children to observation periods and to assign each observer to particular children. The design involved assigning six different observers to each of six observation slots for each child. Eighty-five per cent of the observations implemented the design.

In our problem-solving task, the child was asked to guess under which one of three boxes a charm was consistently hidden. The relevant cue to be discovered by each child was middle-sizedness, namely that the charm was hidden always under the middle-sized box, which differed in no other way from the two other boxes. The child was told that there was a way of finding out and

guessing correctly in each try which one of the boxes hid the charm. The child was always given 30 trials unless he reached the criterion of six errorless trials earlier in the series. Correction was permitted in each trial and the order of presentation was varied randomly from trial to trial. The child received no reinforcement for success other than his perception of having made the correct response, which led to the discovery of the treasure.

The data presented in Table 12 are of a descriptive nature. The Table is divided into four sections. Section I reports average frequencies of dependency requests made by children of the teachers. It can be seen from inspection of the first three rows that the boys' data clearly support our first hypothesis. Gainers make at least twice as many instrumental help requests, that is, realistic requests for help, than the other two groups. The boy gainer also made twice as many more realistic than emotional dependency requests. Neither of the other two groups yielded such findings. The data for the girls also support our hypothesis but in quite a different way. Here we find that girls who lost in I.Q. made on the average, less than half as many realistic requests for help than the other two groups of children. However, the girls who gained in I.Q. made less than half as many ploys for negative attention than the other two groups of girls. The data for girls on seeking physical contact were equivocal. Thus, we might conclude that our first hypothesis was clearly supported by our findings for boys and was partially (and indirectly) supported by our findings for girls.

Section II in Table 12 deals with the teachers' reactions to the children's requests for help. We find that the data support our second hypothesis. Boys who gained received at least twice as many positive reactions from teachers than the other boys in the sample. Once more, the evidence for girls

also supported our second hypothesis, but only indirectly. Girls who lost in I.Q. received less than half as many positive reactions from teachers than the other girls.

Section III of Table 12 deals with children's reactions to teachers' responses. In support of our third hypothesis, we find that boys who gained made more, that is twice as many, constructive reactions to teachers' responses than the other boys, but not as strongly. The next part of the third section deals with regressive reactions by the child to the teachers' responses. Although the average response freqeuncy is rather low for this category, the data clearly supports our hyptohesis for boys but not for girls. Boys who lost in I.Q. exhibit more regressive and displace aggressive behavior in response to teacher's failure to meet their demands than the other boys. The data for the girls fail to support this hypothesis.

Section IV of Table 12 deals with the question of whether children who gain received more attention than other children from their social environment when they were engaged in autonomous achievement striving, that is self-sustained, goal-directed behavior. As can be seen from the last two rows of Table 12, boys who gained when they engaged in self-sustanied autonomous activities received at least twice as much unsolicited attention from their teachers than other boys, and about twice as much unsolicited attention (regardless of quality) from their peers than other boys. The data for girls are in the predicted direction for attention from teachers, but not markedly so. However, once more we notice that with regard to unsolicited attention from peers, the support for our hypothesis comes the girl losers rather from the gainess.

Our data concerning relationships between a child's ability to gain from his Head Start experience and his success in problem-solving under conditions of intrinsic reinfrocement is presented in Figure 1. It can be seen from

this figure that children who gained in their intellectual performance from the beginning to the end of Get Set manifested better problem-solving performance over 30 trials than the other children.

It is evident from the preceding section that our intensive observational study and the employment of an experimental learning task supported, and more importantly clarified, some of the major concepts and findings in our longitudinal research reported earlier. The child who gains from his educational experience in the Get Set program differs from other children in the program in his readiness to make realistic demands for help and not in the intensity of his emotional or motivational dependency on the teacher. Thus, our concept of instrumental dependence has more to do with dependency conflict than with emotional dependence. The findings in Secions II and III of Table 12 further support this conclusion. The child who gains from Head Start not only makes more realistic demands on his teacher than other children, but also receives some more positive reactions from the teacher and copes more effectively and constructively with the teacher's reaction to him than other children.

With regard to autonomous achievement striving, we gained important information from our intensive observational study. In summary, we found that children who gained in their intellectual achievement in Head Start received more encouragement from the social environment for being independent and self-sufficient in their activities, and that these children performed better than other children on a learning task when they have to rely on the success of their endeavor as the sole source for their reinforcement, or to put it another way, when they have to make the learning process a self-rewarding one. The implications of these findings for educational planning are the same as the ones stated on page 14 of our report of the longitudinal research. Programs for the

disadvantaged child need to focus on helping these children develop greater trust in the adult environment and thereby overcome their inhibitions and conflicts over turning to the protective adults for support. These children need to be encouraged when they behave autonomously or self-sufficiently and to be given ample opportunity for experiencing success in problem-solving situations so that the learning process may gradually become a self-rewarding one for them.

The final section of this report will deal with relationships between data gathered on a national sample of Head Start children and our own data in the direct observational study. This step was possible because we selected children who were part of the national sample for purposes of our own study. We felt that the soundness of our own work would gain considerably if relationships between our own data collected in an intensive study on a small sample of children would relate in a meaningful way to the data collected less intensively in the national study but of a much larger sample of children. The particular measures taken from the national study will not be described in detail here. For detailed information on each of these measures, the reader is referred to a report by the Institute for Educational Development (the exact nature of this reference is to be established and put in a footnote.)

The findings of this analysis are all based on Mann-Whitney U tests or on "t" tests.

Children from crowded homes made fewer realistic demands for help from the teacher ($p < .10$) and were less effective in evoking a reaction from the teacher to their demands ($p < .10$). These children from more crowded homes also made less constructive use of the help they received from the teacher in response to their requests. When engaged in their own activity, the same group

of children were less distracted by other children. This first cluster of findings strongly suggests that the child from a lower-class, crowded home has a less intensive relationship with the teacher in the Get Set Program. The particular aspects of this relationship which are weaker would appear to lower the readiness of a child from a crowded home to gain from his educational experiences in the Get Set Program.

A factor analysis of the behavior inventory employed in the national study yielded several factors. We investigated the relationship of these factors to our own data. We found that children who were high on a factor of impulsivity, excitability and defiance were less effective in getting the teacher's attention. The same children had greater difficulty continuing their on-going activity when another child or adult entered their field of action. This finding suggests a vicious cycle. The impulsive, excitable and defiant child has difficulty in relating with others. However, the adult is less responsive to this child, even when the child makes an attempt to enter into a relationship with his teacher. Thus, the very difficulty becomes self-perpetuating.

Children who are rated high on inhibition, withdrawal and mistrust of others on the behavior inventory, exhibited fewer positive attention-getting responses towards teachers than other children. This finding may be considered an independent validation of the behavior inventory by our method of direct observation.

The national study made available to us data concerning the behavior of teachers through the Observers Rating Form. We were particularly interested in relating the characteristics of the teachers of our children as measured by the observational technique in the national study to the successsof our own children

in learning a cognitive task under conditions of Task Intrinsic Reinforcement. We found that the children of teachers who used better and more diversified techniques of teaching and children of teachers who cultivated more respect for the rights, possessions and idiosyncrasies of others, learned our problem-solving task better under conditions of Intrinsic Reinforcement than children from other teachers. A similiar trend was found for children of teachers who exhibited greater respect than other teachers for the child's family. (p.10) Interestingly, the same characteristic of teachers that is, showing respect for the child's family, was very significantly associated with a child's readiness to gain from the educational experience in the classroom. In other words, more of our children who showed a positive gain on the Stanford-Binet came from teachers who manifested more respect for the child's family. Here may be an important link between the classroom and the family which deserves a good deal of attention in continued efforts of educational programs for lower-class, disadvantaged children.

TABLE 12. CHILD-TEACHER INTERACTION SEQUENCES. AVERAGE FREQUENCIES OF DEPENDENCY REQUEST BY CHILDREN, RESPONSES FROM TEACHERS AND REACTIONS FROM CHILDREN WHO GAINED, LOST, AND SHOWED NO CHANGE IN STANFORD BINET PERFORMANCE FROM THE BEGINNING TO THE END OF A YEAR'S ATTENDENCE IN HEADSTART CLASSES.

	BOYS			GIRLS		
	GAINERS (N-4)	LOSERS (N-7)	NON CHANGERS (N-6)	GAINERS (N-6)	LOSERS (N-7)	NON CHANGERS (N-4)
			Section I			
Instrumental vs Emotional Dependency						
Seeks instrumental help	10	4.9	1.1	5.0	1.7	10
Seeks negative attention	4.8	3.3	.7	.7	1.7	4.2
Seeks physical affection	4.5	3.7	.8	7.3	2.6	8.5
			Section II			
Teacher Responses						
Positive teacher responses	15	7.6	2	10	4.1	14
			Section III			
Child Response to Teacher						
Constructive reactions to teacher's response	24	10	3	11	7	2.8
Regressive and displaced aggressive reactions to teacher frustration	.2	.6	0	.2	0	1.2
			Section IV			
Attention Received for Autonomous Behavior						
Adult approaches	8.2	3.9	2.3	6.0	5.0	2.3
Peer approaches	10.2	5.7	5.6	5.8	4.4	5.7

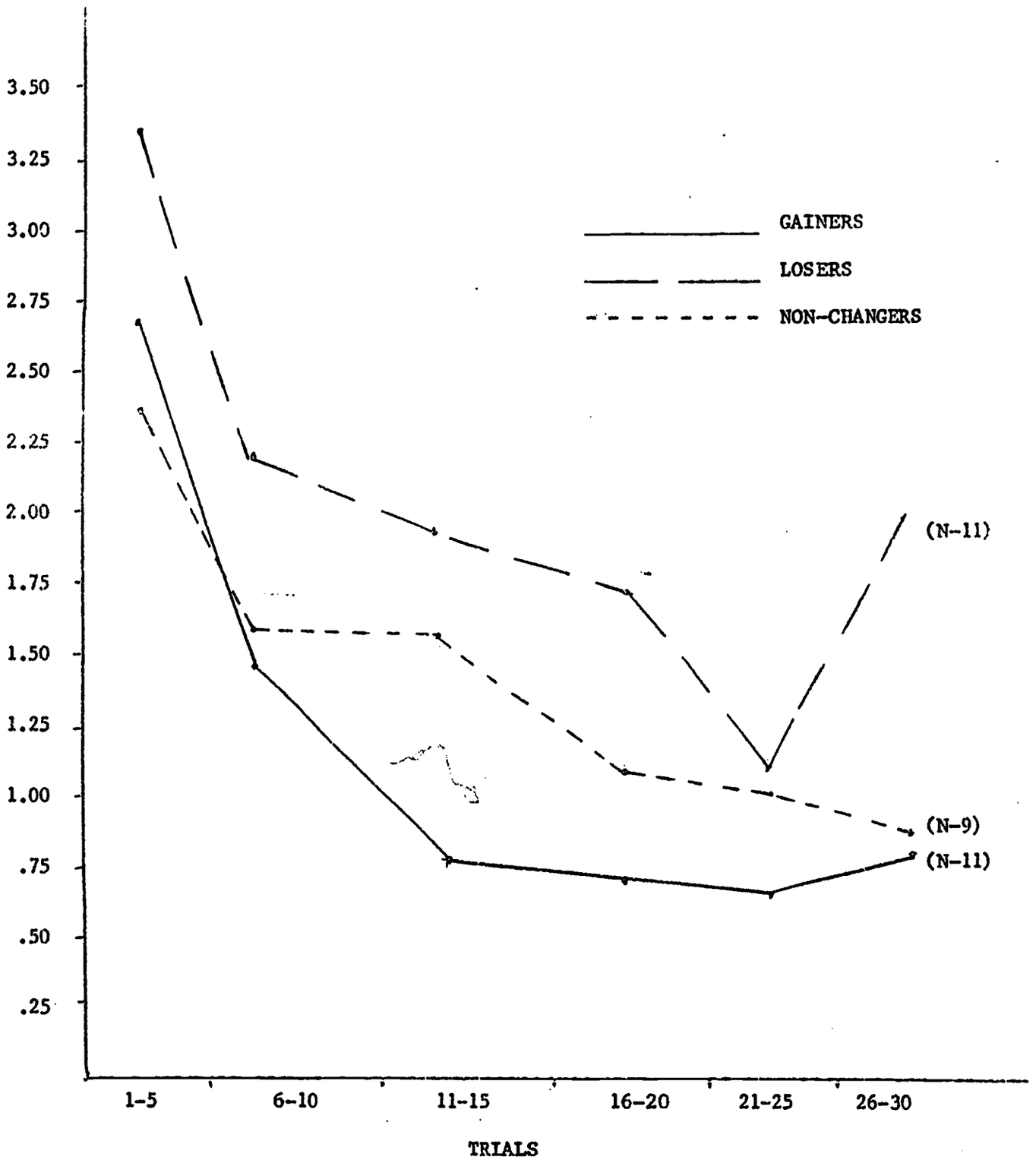

FIGURE 1

AVERAGE NUMBER OF ERRORS OVER 6 BLOCKS OF TRIALS FOR 3 GROUPS OF HEADSTART CHILDREN