DOCUMENT RESUME

ED 044 536 08 AA 000 638

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TITLE Longitudinal Results of the Ypsilanti Perry Preschool Project. Final Report. Volume II of 2 Volumes.
INSTITUTION High/Scope Educational Research Foundation, Ypsilanti, Mich.; Ypsilanti Public Schools, Mich.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO BR-5-0328
PUB DATE Aug 70
CONTRACT OEC-4-10-085
NOTE 189p.

EDRS PRICE EDRS Price MF-$0.75 HC-$9.55
DESCRIPTORS Academic Achievement, *Cognitive Development, Culturally Disadvantaged, Curriculum Development, Demography, Home Visits, Individual Development, *Longitudinal Studies, Measurement Instruments, Negroes, Parent Participation, *Preschool Programs, *Program Evaluation, Tables (Data), Testing, Tests
IDENTIFIERS *Piaget

ABSTRACT

The Ypsilanti Perry Preschool Project was an experiment to assess the longitudinal effects of a 2-year preschool program designed to compensate for functional mental retardation found in some children from disadvantaged families. The program consisted of a daily cognitively oriented preschool program and home visits each week to involve mothers in the educative process. The project was initiated in September 1962 and the phase covered in this report was terminated in June 1967. The 58 experimental and 65 control black children participating were economically and educationally disadvantaged. Instruments used to evaluate the project included a variety of intelligence and performance measures, several parental attitude instruments and teacher rating scales. Data were collected on home background, birth complications, cognitive, achievement and socio-emotional variables. Children who participated in the program obtained significantly higher scores than control group children on measures of cognitive ability and achievement and received better teacher ratings on academic, emotional and social development. The significant difference in cognitive ability disappeared by third grade but other gains were maintained. Recommendations and implications for compensatory education are given and sample data collection instruments are included in the appendixes. (NH)

LONGITUDINAL RESULTS OF THE YPSILANTI PERRY PRESCHOOL PROJECT

Final Report
Volume II of 2 Volumes

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The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

Project No. 2494
Grant No. OE 4-10-085

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ACKNOWLEDGMENT

The Ypsilanti Perry Preschool Project was the work of many people over the years. During the course of the five years of operation various staff participated from one to five years. Of special importance was the work of the teachers who implemented the project with the children and their families. The teachers rose to difficult and demanding tasks with gratifying dedication. It was because of them the Perry Project was able to attain its teaching and research goals. Mrs. Donna McClelland and Evelyn Moore were head teachers. Mrs. Linda Rogers, Mrs. Judy Borenzweig, Colby Hart, Mrs. Carol Emmers, Mrs. Helga Orbach, Mrs. Louise Derman, Mrs. Mary Hamilton, and Mrs. Emmalyn Anderson were teachers. The project has the benefit of active research assistants, Mrs. Hanne Sonquist and Mrs. Lora O'Conner, and research associates, Dr. Virginia Schmidt, Dr. Constance Kamii, and Dr. Norma Radin, all of whom made many important and original professional contributions to the research. Mr. Gene Beatty, principal of Perry School, gave needed support when necessary. Throughout the years of the project, Ypsilanti Public School superintendents, Dr. Ray Barber, John Salcau, and Dr. Paul Emerich and Michigan State Department of Education personnel, Dr. Nicholas Georgiady and Dr. John Porter were instrumental in facilitation of the work.

The Ypsilanti Perry Preschool Project was undertaken and completed because of the direct support and permission of the Ypsilanti Board of Education and the Washtenaw County Board of Education. Without the long-term commitment of these groups, the project could not have been completed.

Kay Deller, Naomi Karow, Nancy Naylor, Mary Tait, Suzette Wright, and Catherine Sniderman provided special assistance in typing, data analysis and editing of this report.

My thanks are extended to each of these individuals and groups.

David P. Weikart

August 24, 1970
High/Scope Educational
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CHAPTER I

Introduction

Summary

The Ypsilanti Perry Preschool Project was an experiment to assess the longitudinal effects of a two-year preschool program designed to compensate for functional mental retardation found in some children from disadvantaged families. The program consisted of a daily cognitively oriented preschool program and home visits each week to involve mothers in the educative process. The project was initiated in September, 1962 and the phase covered in this report was terminated in June, 1967.

The population from which the sample was selected was black and economically and educationally disadvantaged. Control and experimental groups were equated for mean cultural-deprivation ratings and mean Stanford-Binet IQ.* Instruments used to evaluate the project included the Stanford-Binet, the Leiter International Performance Scale, the Peabody Picture Vocabulary Test, the Illinois Test of Psycholinguistic Abilities, the California Achievement Test Battery, several parental attitude instruments, and teacher ratings.

The preschool curriculum which evolved over the duration of the project was derived mainly from Piagetian theory and focused on cognitive objectives. Emphasis was placed on the teacher's flexibility in gearing classroom activities to individual children's level of development. Heavier emphasis was placed on verbal stimulation and interaction, socio-dramatic play, and on field trips than on social behavior and other traditional concerns of nursery schools.

Weekly afternoon home visits provided each family with an opportunity for personal contact with the child's teacher. The mother was encouraged to participate in the actual instruction of her child, thereby increasing her understanding of school, of teachers, and of the educative process. The teacher's child management techniques indirectly taught the mother alternative ways of handling children. Group meetings were used to reinforce the changes in individual parent's views concerning the education of children.

*We know now, nine years after the start of the project, that cultural-deprivation scales and the Stanford-Binet can be misused in judging the level of development of children from low-income homes. Nevertheless, the use of these measures at the initiation of this project did allow services for children who met state requirements for participation. At no time have we felt that the Stanford-Binet reflects the genetic potential of the child.

The Project involved a series of replications to obtain sufficient numbers for longitudinal study. Since the youngsters attended preschool for two years, a new pair of three-year-old experimental and control groups was added each year to the previous samples. The various groups who attended school for different lengths of time have been designated as "Waves". Wave 0 and Wave 1 started preschool in the fall of 1962. Wave 4, the last wave of this study, began in the fall of 1965 and completed the second year in June, 1967.

The general findings of the project are:

1. Children who participated in preschool obtained significantly higher scores on measures of cognitive ability than control group children. As both groups progressed through school this superior functioning disappeared by third grade.

2. Children who participated in preschool obtained significantly higher scores on achievement tests in elementary school than control group children. This significant difference continued throughout the years of follow-up, including third grade.

3. Children who participated in preschool received better ratings by elementary school teachers in academic, emotional, and social development than control group children. This difference continued throughout the follow-up years including third grade.

The conclusion of the study is that preschool programming, at least as represented in this project, is an effective device for improving the general functioning level of disadvantaged black children who were initially diagnosed as functionally mentally retarded.

Social Context of Project

It is difficult from the vantage point of the 1970's to realize that the broadly available preschool programs in the United States today are of very recent origin. Until 1965 preschool education was primarily the province of university laboratory schools, several small national parent cooperative movements, scattered welfare day care programs, and a very few research projects. The theoretical information on the effects of

early education was minimal and contradictory. Indeed, the general public thought of preschool as a poor, almost improper, substitute for the home and neighborhood environment. A major period of public responsibility for young children occurred during World War II when day care nurseries were established for the children of women working in the shipyards and airplane plants. These nurseries were closed with almost embarrassed haste when the war ended, however.

The current trend toward preschool education didn't suddenly begin in 1965 with the advent of Head Start. There was a gradual process of awakening to the potential of preschool that began in the late 1950's. Having solved the post-war problems and having produced an affluent society, there was a gradual public awareness that certain groups were not participating in the educational, cultural and economic mainstream of society. As was forcefully documented by the Supreme Court decision on segregated schools in 1954, the nation, however reluctantly, was beginning to think of social and educational equality as legitimate goals of our democratic society. This newly awakened national conscience forced a challenge to many assumptions held by educators. For example, traditionally it had been assumed that when a youngster failed in school it was the fault of the child rather than the school curriculum or system of education. "He should study harder or make it up in summer school." It was also assumed that his parents had failed in child rearing and socialization, and that the family's cultural milieu had failed to provide supportive structures to the child and his family to bring about the child's adequate development. In 1965 it was seriously suggested that the youngster's problems were the fault of the schools. The fact that most of the youngsters having difficulty in the educational system came from minority groups and were financially impoverished forced educators to closely examine their assumptions. Either these minority youngsters were unable to be educated because they were deficient in ability to manage the intellectual and personal discipline required for normal school programs, or the schools were unable to educate them because of inadequate curricula, teachers, and procedures, etc. Whichever position was taken, compensatory education, either through intervention or enrichment, seemed to be a possible solution. Children could gain new skills and attitudes; schools could gain new methods of teaching and curricula.

In the early 1960's the case for employing preschool education as a method of compensatory education for disadvantaged children was founded upon a belief in its potential and not upon fact. There were few recent studies of disadvantaged children outside of orphanages and other atypical circumstances. The pioneering work of Wellman, Skeels, Skodak, and others with mentally retarded children at the Iowa Child Welfare Station had been largely forgotten or smugly discredited by academic psychologists and statisticians (Goodenough, 1939, McNemar, 1940). Skeels' amazing thirty-year follow-up data on one group of mentally retarded children in the early Iowa series was not published until 1966. The only major preschool education research study had been published by Kirk (1958). He studied many handicapping conditions and employed a diagnostically based curriculum. While reviewing his data, he pointed out that the children from disadvantaged homes and without obvious physical reasons for being mentally retarded might possibly be aided through preschool education. However, general summaries of preschool research in the early 1960's were frankly discouraging. Preschool as a compensatory education method might have been overlooked had major social forces not been at work.

In 1965, summer Head Start was initiated for 500,000 children at a cost of over $90,000,000. The civil rights movement had become militant, and the pressure to "do something" resulted in the War on Poverty legislation passed by Congress in 1964. Community Action Programs (local committees to supervise local anti-poverty efforts) had been organized around the country and were ready to act. The country literally grabbed Head Start from the position of a relatively obscure program for about 50,000 children with a budget of a few million dollars that Lady Bird Johnson had first proposed and shoved it into national prominance with a charmed political life. From March, 1965, when the program was first officially announced until June two months later, the size of the program increased tenfold.

The theoretical rationale for Head Start came from men like Hunt (1961) who summarized the interaction theory of intelligence (an individual develops intellectual ability as a product of interaction between himself and the environment) and Bloom (1964) who documented the significance of early childhood experience for total child development. But the promise that the general public responded to was that

Head Start was going to help poor children do as well as middle class children in school . . . in eight weeks. Relegated to the background were such nagging problems as the role of genetic potential in determining the limit of general intellectual functioning. Obviously Head Start did not come about as a response from educators to pressure from academia and a long tradition of careful research; it came about as a response from politicians to the pressure from the streets. Head Start did not evolve from theoretical logic but from cultural change.

Given the surge of activity in early education programs, it is reasonable to assume that in 1970, after almost a decade of research based on Head Start and other preschool programs, the findings would support the enthusiasm. This is not the case. Indeed, extensions of preschool programs for disadvantaged children have been granted in spite of firm evidence of their general ineffectiveness. The Westinghouse study (1969), which attempted to look at the overall impact of Head Start, is of importance in documenting this point. The findings cast doubt on the ability of Head Start early education programs to achieve their stated goals. Although the methods used in the study were severely criticized, its findings are in direct agreement with other reviews (Weikart, 1967; Freeman, 1970). In addition, a similar study reached parallel conclusions in a closely allied field: the Coleman report (1966) stated that if a pupil's socio-economic status was considered, his success in school could be predicted with considerable accuracy, regardless of the particular school he attended.

A report by the American Institute of Research (Hawkridge, Chalupsky, and Roberts, 1968) also dealt with the lack of success in compensatory programs, although it differed considerably from the Westinghouse study in tone and method. It reviewed data from programs in preschool through twelfth grade, seeking to identify "successful ones. Out of 1000 projects nominated as successful by educators and researchers throughout the country, only 21 compensatory education programs (six of which were preschool projects) obtained statistically significant improvements in intellectual or academic functioning--not even the number one might expect by chance alone.

The Ypsilanti Perry Preschool Project was one of the studies identified by Hawkridge et al. as successful. The present report describes the Perry Project and includes data from the initiation of the project in September, 1962,

through the formal close of the project in June, 1967. At that time, the preschool operation evolved into the Ypsilanti Preschool Curriculum Demonstration Project, (Weikart, 1969) while long term follow-up of Perry Project children has continued into the elementary school years.

The project has spanned a period of rapid development and expansion in preschool education. While the research design has remained constant throughout, the curriculum employed in the project has undergone constant revision and is now known as the Cognitively Oriented Curriculum; it is presented in the first volume of this report: The Cognitively Oriented Curriculum: A Framework for Preschool Teachers. As of this writing, the youngest children in the project are entering third grade, and the final data collection for the first follow-up phase is scheduled for the spring of 1971. A future report will present the complete results of all participating children through two years of preschool and the first four years of elementary school. A second follow-up phase will assess the educational and personal development of the participating children through high school.

Historical Background of Project

The Ypsilanti Perry Preschool Project was established in the fall of 1962 after several years of preparation and planning. In 1958 and 1959, a series of internal studies of the Ypsilanti Public Schools (conducted by Weikart, then director of the Special Services Department) presented two facts: first, by ninth grade at least 50% of the children attending the Ypsilanti schools were overage in grade from one to five years; and second, the achievement rate for these children was considerably below average on national norms. It was also found that children in lower class schools within the system had much lower achievement rates and much higher retention rates than did children in middle class schools. For example, in one lower class school, 50% of the children had already been retained by fourth grade; the school's standardized achievement rate, averaged over a seven year period, was below the 5th percentile across all classrooms. In contrast, children in one middle class school had only an 8% retention rate by sixth grade and a seven year standardized achievement rate average above the 90th percentile.

This information on achievement and retention rates was officially presented to the curriculum council and the principals of the school system. After a discussion of these findings, there was general agreement among the principals that everything possible was already being done. Since further change within the schools seemed impossible, an alternate procedure was elected.

An ad hoc committee was established, composed of Special Services personnel and two progressive building principals. The position adopted by the committee was that the focus would be upon preparing children to operate independently within existing schools. Several decisions were made in the fall of 1960. First, while it was clear that middle class children have problems in terms of procuring an education, their problems are minimal compared to those of youngsters from lower class and disadvantaged backgrounds. Therefore, the compensatory program adopted would be for disadvantaged children only. Second, focus would be on working within the black community in Ypsilanti, because it was much larger than the lower class white community, and because of the extensive interest expressed by both the community leaders and the principal of the school serving the black area. Third, since children from disadvantaged homes entered school with cognitive deficits which limited their capacity to make legitimate demands upon the educational system, the committee decided on the establishment of a preschool program designed to prevent the deficits from occurring. And fourth, because of a new State of Michigan Education Department ruling, it was decided to work only with those disadvantaged youngsters who tested as though they were in the educable retarded range. The State of Michigan's regulations for special education had been altered in 1959, making state funds available for preschool programs for the educable mentally retarded. It was assumed from the outset that intelligence test scores, which were used to categorize "educable mentally retarded children," did not assess basic or genetic capacity but rather assessed functioning levels created by the interaction between the environment and the child. This view of intelligence, of course, was contrary to the prevailing opinion at the time. While Hunt's book with its outstanding review of the nature of intelligence came out in 1961, it was not known to the committee until 1963.

With state and local operational funds secured, the project began classes in the fall of 1962. Additional funds to support the research were obtained in January, 1964 from the Office of Education Cooperative Research Program through a grant to the State of Michigan Department of Education. Until the federal research funds become available, the research activities were made possible by volunteer help and careful scheduling of professional staff time.

Theoretical Background of Project

The decision to turn to preschool as a compensatory education method was made on the practical grounds that there was little hope for reform of the school system's educational practices at that time. The present problems confronting efforts toward school reform throughout the nation give some indication of how difficult such reforms would have been in 1962 before the current ground swell of support appeared.

At the start of the project, there was almost no theoretical evidence to suggest preschool education as a viable alternative solution. On the last day of the annual convention of the American Association on Mental Deficiency in 1961, a panel of child psychologists presented a series of papers on the educational problems of the disadvantaged child. The general consensus of the panel was that preschool intervention might have the necessary impact to correct the cognitive deficits with which such children start school. At the time this panel met, such thinking regarding preschool was mere speculation, as only a few research projects had been undertaken with disadvantaged children.

In spite of the lack of data, preschool intervention seemed promising. As Bloom pointed out in his summary of research on child development in 1964, children's greatest intellectual growth occurs before age four, suggesting that as the optimal time for intervention. Scott (1962), working with animals, developed the concept of a "critical" period. He observed the effect of various kinds of early environmental deprivation on lambs and puppies and concluded that timing of early experiences is a crucial factor in development. He hypothesized that various kinds of experiences have some effect when they occur at one period in time but not when they occur at another: "Organization can be strongly modified only when active processes of organization are going on." In carefully controlled studies with laboratory rats, Krech (1960) and others had successfully identified and measured physiological changes in the brain which related directly to early experiences.

Perhaps Pasamanick and Knoblock (1961) documented the impact of deprivation most vividly in their study of infant development. They employed samples of black and white full-term infants selected for equal birth weights and absence of defects. Using the Gezell Development Scale, they found no significant difference

between the two groups at 40 weeks of age. The white babies obtained a developmental quotient (DQ) of 105.4 and the black babies a DQ of 104.5. At three years, the first 300 of the original 1000 children involved in the study were re-tested, and a highly significant difference was found. DQ of the white children had risen to 110.9, while the DQ of the black children had fallen to 97.4. Their conclusion was:

> . . . it is now possible to entertain a new tabula rasa theory which hypothecates that at conception individuals are much alike in intellectual endowment except for the few rare hereditary neurologic defects. It appears to be life experiences and the socio-cultural milieu influencing biological and physiological function that in the absence of organic brain damage make human beings significantly different behaviorally from each other. (p. 86)

As can be seen from this brief overview, the Ypsilanti Perry Preschool Project was launched because of strong practical needs to solve major problems faced by children enrolled in the public schools, and it was supported at best by a thin theoretical framework, suggesting that preschool intervention might be an effective ameliorative technique.

Current Status of Preschool Research

With the increasing interest in preschool education, a number of writers have presented reviews of the early history of the movement. Contributions of early educators such as Comenius, Froebel, Oberlin, Montessori, McMillan, and others have been summarized by Brittain (1966), Kraft et al. (1968), and Horowitz and Paden (1970). The main impact of these early educators was to create a philosophy and climate for the serious consideration of the education of the young. They recognized that the experiences of early childhood formed the basis for later learning. They tended to stress the value of play, and they often recommended that children be provided with special environments to develop maximally. Montessori

developed a special curriculum, complete with new materials and methods. McMillan labored to introduce nursery schools as part of the English education system. Men like Oberlin saw early education as a way of curing the world of its ills by teaching their view of utopia, an approach which many modern authoritarian states have used.

Reviewers of preschools before the current wave of compensatory education studies found that most of the information available was on middle class children enrolled in laboratory schools or on projects of such limited scope that the data were meaningless. Fuller (1960), Sears and Dowley (1963), and Swift (1964) provided excellent reviews. In general, Swift summarized the literature best by saying that although there is no evidence that preschool helps a youngster, there also is no evidence that it harms him.

There is little concern in these reviews with the issues that are the focus of current preschools for the disadvantaged. For example, few projects listed the cognitive aspects of child development as a concern of their programs. Sears and Dowley (1963) recognized this when they commented: "It is curious that in the stated aims and purposes of the nursery school, intellectual development of the child has been very little considered." The kinds of concerns which are given attention in the traditional nursery schools are quite different from those emphasized in the modern, cognitively oriented, nursery schools.

On the whole, these reviews summarized information about middle class children attending middle class college campus nursery schools and reflected the deep concern of traditional nursery school education with "the achievement by the child of some emotional independence of adults without undue side effects such as anxiety or insecurity" (Sears and Dowley, 1963, p. 823). They also reflected full philosophical commitment to the freedom of the nursery school teacher to deal independently and intuitively with the educational program for the children enrolled in her class without the need to follow a specified curriculum based on specific cognitive or language theories. The ideal is the master teacher responding to the "needs" of the children as seen from her vantage point of general knowledge about child development and personal wisdom and experience (Weikart, 1970).

The current reviews of compensatory preschool projects tend to indicate one specific finding. Experimental projects in which researchers have direct control of the curriculum, the operation of the project, and the research design seem to offer high potential for immediate positive impact in terms of their stated goals. The main reviews of this group are Weikart (1967), Gray (1969), and a comprehensive review by Horowitz and Paden (1970). The findings of Hawkridge, et al. (1968), however, cast into doubt even this simple conclusion, and the critical findings by Freeman (1970) and the Westinghouse study (1969) indicate the fragile nature of the current preschool work.

At this time, several studies have passed beyond the category of immediate results and into long-term follow-up status. The most complete is that by Skeels (1966), who reported 30-year follow-up results of an early study by the Iowa Child Welfare Station. The social and occupational adaptation of the experimental children was impressive when compared to the almost total lack of adjustment on the part of the control children. This finding gives considerable strength to the notion that while immediate impact of a project may be difficult to ascertain, long-term results may be very favorable when the intervention establishes a basic alteration in the general environment of the child. The youngsters who were in the control group remained in state institutions and did not have the opportunity to participate in a normal environment. Therefore, the results must be seen as a contrast of normal environmental opportunity vs. deprived environmental opportunity rather than simply as positive treatment.

The second study is one by Gray and Klaus (1969). In their seven-year follow-up report, they concluded that while there seemed to be definite spreading of the project's impact to other children in the community and to younger siblings, in general and by fourth grade there were no significant achievement differences between control and experimental groups. While there was a significant difference in Stanford-Binet IQ scores in favor of the experimental children in the fourth grade, the differences disappeared for the Illinois Test of Psycholinguistic Abilities and the Peabody Picture Vocabulary Test. It is a remarkable achievement to have created this impact through the seventh year of a study and four years after any formal intervention.

In a curriculum comparison study in 1969, Karnes reported on the first grade follow-up of a preschool operated three years earlier. Two curricula (the Ameliorative curriculum, operated by Karnes, and the Direct Verbal curriculum, operated by Engelmann) were being studied; a traditionally oriented nursery program was used for baseline data instead of a control group. At the end of the first grade, there were no differences in measured Stanford-Binet scores between the two structured curricula employed in the project and the traditional group. However, the general academic progress of children in the two structured curricula was better than that of children in the traditional curriculum.

There is a range of other important research projects which are not described (Hodges, McCandless, and Spicker, 1967; Di Lorenzo, 1968; Beller, 1969), but it is clear from the above that preschool is not a simple or easily applied solution to the problems of the education of disadvantaged children.

With this review of the context of the current preschool education movement, let us turn now to the Ypsilanti Perry Preschool Project.

Chapter II

Sample Description

Description of Background Population

The population from which the sample of the Ypsilanti Perry Preschool Project was drawn consisted of the three- and four-year-olds who were living within the Perry School attendance area, who were members of "culturally deprived" black families and who were functionally retarded, testing in the range of "educable mentally retarded."

The Perry School attendance area is located in Ypsilanti, Michigan. Ypsilanti is a community of about 50,000 on the fringe of metropolitan Detroit, encompassing a wide spectrum of socio-economic levels. With its great diversity of people and products, Ypsilanti is a microcosm of a large urban city such as Detroit or Chicago. In the city or nearby, are Eastern Michigan University, many small factories, and some large industrial plants, such as a Ford Motor Company parts plant. There are new middle-class housing subdivisions in the area, as well as some older sections where deteriorating homes predominate. When the project began in 1962 few of Ypsilanti's 25% black population were in the middle class or above; many worked in service occupations in neighboring Ann Arbor. Virtually all the black population lived in the southwest section of the city, and most lived within the Perry School attendance area.

To determine specific characteristics of the project population, a questionnaire was administered to the approximately 300 families with children attending Perry School by the classroom teachers during the May, 1962 parent-teacher conferences. In order to complete the survey, home visits were made during the same month to parents who did not attend the conferences. The Perry School data were compared with similar information collected during the same month from parents registering their children for kindergarten at the Erickson Elementary School, an all-white school located in an upwardly mobile middle-class section of the Ypsilanti Public School District. Since all the parents who enrolled children in Erickson School completed the questionnaire, and almost every child of kindergarten age, including Catholic children, was registered, the data on the Erickson School families are felt to be complete.

As is evident from Table 2-1, the data underscore the socio-economic differences between these two attendance areas. Because the collection of socio-economic data for the total Perry Preschool sample extended across four years, only the subsample whose data were collected concurrently with the Erickson School and Perry School data (Perry Preschool Waves 0 and 1) are presented for direct comparison in Table 2-1. Comparison of this subsample with the total Perry Preschool sample shows no significant differences. The parents of the total sample are a couple of years younger and attended school a little longer than the parents of the subsample; the percent of fathers living in the home is 5% higher; 8% more of the mothers are employed; and 8% fewer children live in families supported by welfare. Such differences operate to raise the average socio-economic status of the total sample slightly over that of the subsample (as reflected in a .2 increase in the average cultural deprivation rating). However, the total Perry Preschool sample is still at the low end of the relatively underprivileged Perry School population.

Description of the Ypsilanti Perry Preschool Project Sample

During the five years of the project, 123 children were chosen from the Perry School attendance area for the sample. Of these, 58 attended the preschool (the experimental group) and 65 did not attend the preschool (the control group) but participated in annual data collections. Each fall the project's staff used school census data to locate all families in the Perry School area with three-year-olds (and four-year-olds in the preschool's first year of operation). These families were then interviewed to determine which ones had low scores on a Cultural Deprivation Scale* which gave equal weight to the educational level of the parents and the occupational level of the father (and mother if employed), and half weight to household density. The Stanford-Binet Intelligence Scale was administered to all children whose families' scores on the Cultural Deprivation Scale (C.D. ratings) were below 11. Those children scoring in the educable mentally retarded range (IQ's between 50 and 85) with no discernible organic involvement were assigned to the experimental or control samples. This process was essentially random, although the groups were matched on C.D. ratings and Stanford-Binet scores. In addition, boy/girl ratio and percentage of working mothers were balanced when possible.

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* See Appendix A for the interview schedule used to collect information for calculating scores on the Cultural Deprivation Scale and for the method of calculating the Cultural Deprivation scores.

The mean values for the complete Ypsilanti Perry Preschool Project sample on these "sample selection variables" were as follows: mean chronological age at entry to the project was 42.3 months; mean C.D. rating was 8.4; and, mean Stanford-Binet I.Q. was 79.0. For the additional variables on which the groups were matched when possible, the total sample had 71 boys (58%) and 52 girls (42%), and 35 children (28%) had mothers who worked outside the home. All these sample selection and group matching variables are tabulated for the experimental and control groups separately in Chapter III: Experimental Method (Table 3-1).

After the sample children were selected, the preschool staff interviewed their mothers to obtain further information about their home environments. Three instruments were used: The Perry Demographic Questionnaire, the Inventory of Attitudes on Family Life and Children (Inventory[1]), and the Cognitive Home Environment Scale (CHES). The Demographic Questionnaire was administered each fall to the mothers of the new subjects; the Inventory was administered each fall and again in the spring to the mothers of the new subjects; the CHES was administered to all available mothers in the spring of 1966. In addition, certain data concerning birth complications were collected directly from hospital records in the spring of 1967. Rather than consider all data from these sources in this chapter, selected variables are presented for the experimental group, the control group, and the total preschool sample. The instruments are presented in the appendices[2].

Perry Demographic Questionnaire

Data from the Perry Demographic Questionnaire are presented for the experimental group, the control group, and the total preschool sample in Tables 2-2 through 2-6. For most of the demographic variables, the two groups

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[1]The Inventory was constructed by the preschool staff using items from the Parental Attitude Research Instrument. The latter instrument was used in the earlier years of the preschool's operation, while the Inventory was administered in the later years. All data were eventually coded as the Inventory (see Appendix C).

[2]Appendix B: Perry Demographic Questionnaire; Appendix C: The Inventory of Attitudes on Family Life and Children; Appendix D: The Cognitive Home Environment Scale; and Appendix E: The Infant and Maternal History Schedule.

present very similar profiles. Therefore, descriptions of the sample concentrate on the total sample grouping. The data presented represent the children and their families upon their entry to the sample because no demographic data were collected after the fall of their entering year. Comparisons of the responses from those families having more than one child in the sample (younger siblings entering in later years of the project) indicate that changes frequently occurred in parents' marital and occupational status. In addition, for the experimental group, the teachers were aware of changes in the family structure, in fathers' and mothers' occupations, and in the parents' current state of employment or unemployment. While it is known that changes constantly occurred, their exact nature and how much they balanced each other out are unknown.

In the experimental group there were six pairs of siblings, one group of three siblings, and one group of four siblings. Thus, the 58 children in the experimental group are members of 47 families. Of the 65 children in the control group, there were twelve pairs of siblings, resulting in 53 families in the control group. Although many of the demographic variables could have been tabulated using the family (or mother or father) as the basic unit to be described, data for all 123 children in the sample were tabulated for each demographic variable. Thus, when a mother has more than one child in the sample her data will be weighted accordingly.

Family structure. As presented in Table 2-2, slightly over half the children live in families where the fathers are present. About one-fifth live in some sort of extended family (i.e., persons or relatives besides primary family members live in the home). The average number of children in the samples' families is about five, but this is a widely dispersed distribution (standard deviation of 2.5). Again, considering the average case, most children come from families where there is one younger sibling and three older ones.

Parent age, birthplace (mother), and education. The mothers' and fathers' ages when their children entered the sample both averaged around 30 years. Mothers' ages ranged from 18 to 48; fathers' ages ranged from 22 to 52. The average number of years of school completed by the parents was a little over nine years (Table 2-3). Again there was a wide range (3 to 12 years of education) with 11% of the mothers and 12% of the fathers having attended

school for 12 years. Of the approximately 70% of the mothers born in the South, about 45% were also educated in the South (Table 2-4).

Parent occupational status. Of the 65 children in the sample whose fathers lived with the family, about 85% had fathers who were employed at the time the Demographic Questionnaire was administered (Table 2-5). Most held unskilled jobs (Table 2-3), with only two in jobs classified as managerial (one supervisor at a laundry and one local union president). The most frequently held jobs were janitors, construction laborers, and workers on automotive assembly lines. In many cases, the mothers (who generally answered the questionnaire) were unsure of the fathers' work.

About 35% of the children had mothers who worked outside the home (Table 2-5). Those jobs which were classified all fell within the unskilled category (Table 2-3). The most frequently named jobs were maids, laundry workers, and domestics. Other mothers were store clerks, nurse's aides, cooks, waitresses, and dishwashers.

Source of family income. Half the sample lived in families who received some sort of public assistance (welfare, ADC, etc). Of the 65 children living in families where fathers were present, 21% had both parents working, 61% had only their fathers working, and 14% had neither parent working. Of the 58 children living in fatherless families, the mothers were employed 36% of the time.

Description of physical home environments. The average size of the childrens' homes was about six rooms. Density of persons in the homes (rooms per person) averaged 0.8. Summarizing data from teacher home visit reports written over the 1964-65 school year (visits to 21 experimental families), about 40% of the families lived in public housing, about 30% lived in houses converted to apartments, 10% lived in apartment buildings, and about 25% lived in private homes. In general, the teachers considered the homes to be clean, comfortably heated, lacking unpleasant odors, and not unusually noisy. The only common negative teacher rating was for illumination in the homes: 25% were rated "fair", and 50% were rated "poor" (Table 2-6).

Table 2-1

Comparison of Socio-economic Information
for Perry and Erickson Schools and for the Perry Preschool Sample[1]

Variable	Sample[2] Erickson School N = 148	Total Perry School N = 277	Perry Preschool Subsample N = 45
Information about mothers:			
Average age	32	35	31
Average years of education	12.4	10.1	9.2
% working (full or part time)	15%	60%	20%
Average occupational level[3]	2.8	1.4	1.0
% born in South	22%	77%	80%
% educated in South	17%	53%	48%
Population of birthplace[4]	2.4	2.2	2.3
Information about fathers:			
% fathers living in the home	100%	63%	48%
Average age	35	40	35
Average years of education	13.4	9.4	8.3
Average occupational level[3]	3.3	1.6	1.1
Information about families, homes:			
Average cultural deprivation rating	16.4	11.5	8.2
Average number of children	3.1	3.9	4.5
% on welfare	0%	30%	58%
% home ownership	85%	33%	5%
% car ownership	98%	64%	39%
Average number of rooms	6.9	5.9	4.8
Average number of other persons in home	.1	.4	.3

Table 2-1 con't

Variable	Sample: Erickson School N = 148	Sample: Total Perry School N = 277	Sample: Perry Preschool Subsample N = 45
Information about families, homes, con't:			
% having major health problems	9%	16%	13%
% members of library (any family member)	35%	25%	10%
% having dictionary in home	91%	65%	24%
% having magazine(s) in home	86%	51%	43%
% who had visited a museum	42%	20%	2%
% who had visited a zoo	72%	49%	26%

1. Data collected for Perry and Erickson samples in May, June, and Sept., 1962. Data collected for Perry Preschool Project, Waves 0 & 1, fall 1962.

2. Erickson School sample consisted of families whose children were to enter kindergarten in the fall of 1962. Perry School sample consisted of families of all children grades Kdg. through six. Perry Preschool sample consisted of Wave 0 & 1 children (those three- and four-year-olds entering the sample in the fall of 1962).

3. Occupation Ratings: 1 = unskilled; 2 = semi-skilled; 3 = skilled; 4 = professional

4. Size of city scale used: One million and over in population = 5; 500,000 to 999,999 = 4; 100,000 to 499,999 = 3; 10,000 to 99,999 = 2; under 9,999 = 1.

Table 2-2

Family Structure

Variable	Experimental Group (N=58)		Control Group (N=65)		Total Perry Preschool Sample (N=123)	
	N	(%)	N	(%)	N	(%)
Father present/absent						
Present	32	(55%)	33	(51%)	65	(53%)
Absent	26	(45%)	32	(49%)	58	(47%)
Extended family						
Persons besides primary family live in household	8	(14%)	13	(20%)	21	(17%)
No persons besides primary family live in household	47	(81%)	52	(80%)	99	(80%)
Unknown	3	(4%)	0	(0%)	3	(3%)
	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
Number of children in family	4.8	(2.3)	4.9	(2.7)	4.8	(2.5)
Number of children younger than subject	1.0	(0.1)	1.0	(0.1)	1.0	(0.1)
Number of children older than subject	2.7	(1.3)	2.9	(1.8)	2.8	(1.6)

Table 2-3

Parent Age, Education and Occupational Status

Variable	Experimental Group (N=58)		Control Group (N=65)		Total Perry Preschool Sample (N=123)	
	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
Parent Age						
Mother	29.5	(6.1)	28.6	(6.8)	29.1	(6.5)
Father	31.5	(4.8)	33.9	(8.0)	32.8	(6.8)
Parent Education (years of school completed)						
Mother	9.4	(2.3)	9.3	(2.0)	9.4	(2.1)
Father	8.4	(2.3)	11.0	(1.4)	9.7	(1.9)
	N	(%)	N	(%)	N	(%)
Parent occupational status						
Occupational status of father						
Unskilled	21	(78%)	28	(97%)	49	(88%)
Skilled	4	(15%)	0	(0%)	4	(7%)
Managerial	2	(7%)	1	(3%)	3	(5%)
Occupational status of mother						
Unskilled	6	(46%)	19	(86%)	25	(71%)
Skilled	0	(0%)	0	(0%)	0	(0%)
Managerial	0	(0%)	0	(0%)	0	(0%)
Unknown	7	(54%)	3	(14%)	10	(29%)

Table 2-4

Section of country (south vs. non-south) where mothers were born and educated, and populations of mothers' birthplaces

Variable	Experimental Group (N=58)		Control Group (N=65)		Total Perry Preschool Sample (N=123)	
	N	(%)	N	(%)	N	(%)
Section of country where mothers were born						
South	40	(69%)	45	(69%)	85	(69%)
Non-South	8	(14%)	15	(23%)	23	(19%)
Unknown	10	(17%)	5	(8%)	15	(12%)
Section of country where mothers were educated						
South	27	(47%)	27	(42%)	54	(44%)
Non-South	26	(45%)	35	(54%)	61	(50%)
Unknown	5	(9%)	3	(5%)	8	(7%)
Population of Mothers' Birthplaces						
Under 9,999	16	(28%)	22	(34%)	38	(31%)
10,000-99,999	14	(24%)	24	(37%)	38	(31%)
100,000-499,999	10	(17%)	8	(12%)	18	(15%)
500,000-999,999	0	(0%)	0	(0%)	0	(0%)
1,000,000-	2	(3%)	2	(3%)	4	(3%)
Unknown	16	(28%)	9	(14%)	25	(20%)

Table 2-5

Source of Family Income

Variable	Experimental Group (N=58)		Control Group (N=65)		Total Perry Preschool Sample (N=123)	
	N	(%)	N	(%)	N	(%)
Family on Welfare						
Yes	32	(55%)	29	(45%)	61	(50%)
No	24	(41%)	35	(54%)	59	(48%)
Unknown	2	(3%)	1	(2%)	3	(2%)
Father Employed						
Yes	27	(84%)	29	(88%)	56	(86%)
No	5	(16%)	4	(12%)	9	(14%)
Mother Employed						
Yes	13	(22%)	22	(34%)	35	(28%)
No	45	(78%)	43	(66%)	88	(72%)
Employment of Parents						
Families where fathers present						
Both parents employed	6	(18%)	8	(25%)	14	(22%)
Father alone employed	21	(66%)	19	(58%)	40	(61%)
Mother alone employed	0	(0%)	1	(3%)	1	(2%)
Neither parent employed	5	(16%)	4	(12%)	9	(14%)
Unknown	0	(0%)	1	(3%)	1	(2%)
Families where father absent						
Mother employed	7	(27%)	14	(44%)	21	(36%)
Mother unemployed	18	(69%)	18	(56%)	36	(62%)
Unknown	1	(4%)	0	(0%)	1	(2%)

Table 2-6

Description of Physical Home Environments

Variable	Experimental Group (N=58) Mean	(S.D.)	Control Group (N=65) Mean	(S.D.)	Total Perry Preschool Sample (N-123) Mean	(S.D.)
Number of rooms	5.2	(1.2)	6.4	(1.0)	5.8	(1.1)
Density in home (rooms per person)	0.8	(0.3)	0.8		0.8	(0.3)

Description of experimental group homes visited on teacher home visits in 1964-65*	Percent of homes
I. Type of Dwelling	
(a) Government housing project	38%
(b) Converted apartment	29%
(c) Apartment in apartment house	10%
(d) Private dwelling	24%
II. Typical Amount of Illumination	
(a) Excellent	5%
(b) Good	20%
(c) Fair	25%
(d) Poor	50%
III. Typical Temperature	
(a) Comfortable	71%
(b) Uncomfortably warm	19%
(c) Excessively warm	10%
(d) Uncomfortably cool	0%
(e) Excessively cool	0%

Table 2-6 cont.

	Percent of homes
IV. Typical Odors Present	
(a) None or pleasant	71%
(b) Mildly unpleasant	19%
(c) Excessively unpleasant	10%
V. Typical Cleanliness	
(a) Excellent	19%
(b) Good	53%
(c) Fair	29%
(d) Poor	14%
(e) Inconsistent	5%
VI. Typical Noise Level	
(a) Very noisy	14%
(b) Average amount of noise	67%
(c) Usually quiet	19%

* Based on teacher home visit reports for 359 visits to 21 families.

Table 2-7

Description of Mothers' Attitudes on Family Life and Children*

Inventory Items	Percent endorsement: Perry Preschool subsample**(N=59)	Percent endorsement: Erickson Sample (N=50)
I. Class-Sensitive Items		
1. Children should be more considerate of their mothers since their mothers suffer so much for them.	88	8
2. Sex is one of the greatest problems to be contended with in all children.	83	20
3. Children pester you with all their little upsets if you aren't careful from the first.	81	16
4. Children should never learn things outside the home which make them doubt their parent's ideas.	78	14
5. The sooner a child learns to walk the better he's trained.	83	12
6. A mother should do her best to avoid any disappointment to her child.	74	14
7. Parents should know better than to allow their children to be exposed to difficult situations.	73	12
8. A good mother will find enough social life within the family.	83	22
9. Mothers sacrifice almost all their own fun for their children.	78	16
10. The trouble with giving attention to children's problems is they usually just make up a lot of stories to keep you interested.	68	8
11. Most children are toilet trained by 15 months of age.	69	16
12. A mother has a right to know everything going on in her child's life because her child is part of her.	76	26
13. Few men realize that a mother needs some fun in life too.	92	36
14. A child soon learns that there is no greater widsom than that of his parents.	76	22

Table 2-7 cont.

Inventory Items	Percent endorsement: Perry Preschool Sample (N=59)	Percent endorsement: Erickson Sample (N=50)
II. Non-Class-Sensitive Items		
1. Children will get on any woman's nerves if she has to be with them all day.	56	72
2. Children would be happier and better behaved if parents would show an interest in their affairs.	100	98
3. Parents must earn the respect of their children by the way they act.	91	94
4. Children who are held to firm rules grow up to be the best adults.	59	68
5. A child's ideas should be considered seriously in making family decisions.	80	74
6. Parents who are interested in hearing about their children's parties, dates, and fun help them grow up right.	97	94
7. When you do things together, children feel close to you and can talk easier.	95	96
8. When a child is in trouble he ought to know he won't be punished for talking about it with his parents.	86	84

* See Appendix C: Inventory of Attitudes on Family Life and Children

** Mothers of Waves 0, 1 and 2 of the Perry Preschool sample.

Table 2-8

Description of Cognitive Home Environments: Mothers' responses to items of the Cognitive Home Environment Scale*

Cognitive Home Environment Scale Factors and Items	Experimental Group Subsample (N=40) Mean	(S.D.)	Control Group Subsample (N=48) Mean	(S.D.)	Total Perry Preschool Subsample ** (N=88) Mean	(S.D.)
I. Availability and use of educational materials in the home.						
1. Presence and amount of use of library card.	3.4	(2.2)	3.0	(2.1)	3.2	(2.2)
2. Supplies, materials, and equipment available to child at home.	5.0	(1.5)	4.8	(1.2)	4.9	(1.3)
3. Presence and use of dictionary in home.	3.5	(2.2)	3.6	(2.3)	3.6	(2.3)
4. Presence and use of encyclopedia in home.	2.4	(2.3)	1.9	(1.7)	2.1	(2.0)
II. Expectations for child's education						
1. Grade parents expect child to receive in most school subjects.	4.3	(1.4)	4.0	(1.3)	4.1	(1.3)
2. Grade which would satisfy parents.	5.2	(1.4)	4.8	(1.4)	5.0	(1.4)
3. Amount of schooling parents wish child to receive.	5.4	(1.4)	5.0	(1.4)	5.2	(1.4)
4. Amount of schooling parents expect child to receive.	4.8	(1.6)	4.0	(1.9)	4.4	(1.8)
5. Least amount of education parent thinks child must have.	4.3	(1.3)	3.9	(1.7)	4.1	(1.5)

Table 2-8 cont.

	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
III. Educational materials provided for child						
1. Proportion of gifts provided for child which are educational.	2.1	(1.7)	2.1	(1.4)	2.1	(1.5)
2. Number of educational gifts provided for child.	4.5	(1.7)	4.4	(1.7)	4.4	(1.7)
IV. Concern for educational activities						
1. Educational use of television.	1.9	(1.9)	2.1	(1.8)	2.0	(1.9)
2. Parents' concern regarding child's speech and their attempts to correct errors.	3.0	(1.9)	2.9	(2.0)	2.9	(1.9)
V. Educational efforts						
1. Assistance provided child in various learning situations.	4.4	(1.7)	4.2	(1.6)	4.3	(1.7)
2. Quantity and quality of reading to child.	3.8	(1.8)	3.4	(1.5)	3.6	(1.7)

* See Appendix C: Inventory of Attitudes on Family Life and Children.

** Items are scored using a 1 to 7 scale: higher values indicate more desired responses. The sample is restricted because the mothers responded for only one child regardless of how many children they had in the sample, and because not all mothers were available for the CHES interviews which were conducted in the spring of 1966.

Table 2-9

Description of Birth History Data*

Variable	Experimental Subsample (N=48)		Control Subsample (N=53)		Experimental & Control Subsamples** Combined (N=101)	
	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
Mother's reproductive history:						
Number of pregnancies	4.8	(2.7)	4.4	(2.9)	4.6	(2.8)
Number of living children	4.3	(2.5)	4.1	(2.8)	4.2	(2.7)
Mother's medical history during pregnancy with child in preschool sample:						
Interval between last and present pregnancy	24.6	(17.2)	24.1	(18.1)	24.3	(17.7)
Weight gain during pregnancy	26.5	(10.0)	25.6	(11.2)	26.1	(10.7)
Age at delivery	25.1	(6.8)	25.5	(6.8)	25.3	(6.8)
	N	(%)	N	(%)	N	(%)
Complications during pregnancy:						
1. Hypertension/high blood pressure?						
No	45	(94%)	50	(94%)	95	(94%)
Yes	1	(2%)	0	(0%)	1	(1%)
Unknown	2	(4%)	3	(6%)	5	(5%)

Table 2-9 cont.

	N	(%)	N	(%)	N	(%)
2. Kidney infection?						
No	35	(73%)	41	(77%)	76	(75%)
Yes	2	(4%)	4	(8%)	6	(6%)
Unknown	11	(23%)	8	(15%)	19	(19%)
3. Preeclampsia/toxemia?						
Preeclampsia	4	(8%)	3	(6%)	7	(7%)
Toxemia	0	(0%)	0	(0%)	0	(0%)
Neither	43	(90%)	46	(87%)	89	(88%)
Unknown	1	(2%)	4	(8%)	5	(5%)
4. Mother younger than 18 or older than 35 when baby born?						
No	41	(85%)	40	(75%)	81	(80%)
Yes	7	(15%)	11	(21%)	18	(18%)
Unknown	0	(0%)	2	(4%)	2	(2%)
5. Diabetes?						
No	41	(85%)	50	(94%)	91	(90%)
Before pregnancy	0	(0%)	0	(0%)	0	(0%)
During pregnancy only	0	(0%)	0	(0%)	0	(0%)
Unknown	7	(15%)	3	(6%)	10	(10%)

Table 2-9 cont.

	N	(%)	N	(%)	N	(%)
6. Placenta attachment problems?						
No	45	(94%)	47	(89%)	92	(91%)
Premature rupture	0	(0%)	0	(0%)	0	(0%)
Abruptia placenta	1	(2%)	0	(0%)	1	(1%)
Placenta previa	0	(0%)	0	(0%)	0	(0%)
Unknown	2	(4%)	6	(11%)	8	(8%)
7. Heart trouble?						
No	46	(96%)	46	(87%)	92	(91%)
Congenital	0	(0%)	1	(2%)	1	(1%)
Rheumatic	0	(0%)	0	(0%)	0	(0%)
Other	0	(0%)	0	(0%)	0	(0%)
Unknown	2	(4%)	6	(11%)	8	(8%)
8. Type of delivery:						
Normal, no or low forceps	43	(90%)	48	(91%)	91	(90%)
Caesarian Section	1	(2%)	1	(2%)	2	(2%)
Breech	2	(4%)	1	(2%)	3	(3%)
Difficult forceps (high or mid)	1	(2%)	0	(0%)	1	(1%)
Unknown	1	(2%)	3	(6%)	4	(4%)
9. Complications related to oxygen deprivation?						
None	45	(94%)	49	(92%)	94	(93%)
Abruptia placenta	1	(2%)	0	(0%)	1	(1%)
Prolapsed cord	0	(0%)	0	(0%)	0	(0%)
Unknown	2	(4%)	4	(8%)	6	(6%)

Table 2-9 cont.

	N	(%)	N	(%)	N	(%)
10. Labor						
Spontaneous	47	(98%)	48	(91%)	95	(94%)
Induced	0	(0%)	1	(2%)	1	(1%)
None (Caesarian Section)	1	(2%)	1	(2%)	2	(2%)
Unknown	0	(0%)	3	(6%)	3	(3%)
	Mean	**(S.D.)**	**Mean**	**(S.D.)**	**Mean**	**(S.D.)**
Infant's history at birth:						
Birth Weight	6 lbs. 15 ozs.	20 ozs.	6 lbs. 13 ozs.	20 ozs.	6 lbs. 14 ozs.	20 ozs.
	N	**(%)**	**N**	**(%)**	**N**	**(%)**
Sex						
Boy	28	(58%)	32	(60%)	60	(59%)
Girl	20	(42%)	21	(40%)	41	(41%)
Infant Morbidity:						
1. Breathing:						
Spontaneous	45	(94%)	48	(91%)	93	(92%)
Delayed, oxygen supplied	1	(2%)	3	(6%)	4	(4%)
Endotracheal tube	0	(0%)	0	(0%)	0	(0%)
Unknown	2	(4%)	2	(4%)	4	(4%)

Table 2-9 cont.

	N	(%)	N	(%)	N	(%)
2. Symptoms of respiratory problems?						
None	43	(90%)	47	(89%)	90	(89%)
In incubator, no oxygen	2	(4%)	2	(4%)	4	(4%)
In incubator, with oxygen	3	(6%)	2	(4%)	5	(5%)
Unknown	0	(0%)	2	(4%)	2	(2%)
3. Number of days oxygen supplied?						
No oxygen supplied	45	(94%)	49	(92%)	94	(93%)
One day	3	(6%)	1	(2%)	4	(4%)
Two days	0	(0%)	1	(2%)	1	(1%)
Unknown	0	(0%)	2	(4%)	2	(2%)
4. Symptoms of hypoglycemia?						
None	44	(92%)	47	(89%)	91	(90%)
Apnea	0	(0%)	1	(2%)	1	(1%)
Cyanosis	0	(0%)	0	(0%)	0	(0%)
Tremors	2	(4%)	0	(0%)	2	(2%)
Convulsions	0	(0%)	0	(0%)	0	(0%)
Apnea & cyanosis	0	(0%)	1	(2%)	1	(1%)
Cyanosis, tremors & convulsions	1	(2%)	0	(0%)	1	(1%)
Unknown	1	(2%)	4	(8%)	5	(5%)
5. Symptoms of jaundice?						
None	47	(98%)	51	(96%)	98	(97%)
Proven	1	(2%)	0	(0%)	1	(1%)
Unknown	0	(0%)	2	(4%)	2	(2%)

* Appendix E: Infant and Maternal History Schedule

** For a description of the subsample see page 38.

The Inventory of Attitudes on Family Life and Children.

The Inventory (Appendix C) was constructed by the Perry Preschool staff. It is comprised of items from the Parental Attitude Research Instrument* (PARI) which was administered to 50 of the Erickson School mothers and to the mothers of Perry Preschool Waves 0, 1, and 2. Differences in the responses to the PARI items from these two groups of mothers led to selection of certain "class-sensitive" and "non-class-sensitive" items for inclusion in the Inventory. The class-sensitive items on the Inventory are those PARI items which showed the greatest differences in responses between the two groups: the lower class mothers generally endorsed these attitudes while the middle class mothers generally rejected them. The non-class-sensitive items came primarily from the "rapport scales" of the PARI, i.e., scales included because they state such commonly accepted attitudes that almost all respondents agree with them. These items were generally endorsed by both groups of mothers.

Table 2-7 presents the percentages of the two groups of mothers who agreed with the Inventory class-sensitive and non-class-sensitive items. Consideration of the Inventory's class-sensitive items results in the following profile for the lower class Perry Preschool mothers as opposed to the middle-class Erickson School mothers.

The lower class mother viewed herself as a martyr (items 1 and 9) who confines her role to her home life (item 8), lacks empathy from her husband (item 13), and views the outside world suspiciously (item 4). She considered childrearing as a process which fosters emotional dependency (items 6, 7, and 12). She felt that she should accelerate her child's motor development (items 5 and 11) while suppressing his internal impulses (item 2). The lower class mother thought that children should not question parents at all (items 4 and 14) and that communication between children and parents should be avoided (items 3 and 10).

The Cognitive Home Environment Scale.

Table 2-8 presents means and standard deviations for the CHES items included in the total CHES score. All items were scored using a 1 to 7 scale with higher scores

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* Schaefer, E. S., and Bell, R. Q. Development of a parental attitude research instrument. Child Development, 1958, 29 339-361.

indicating more positive responses. CHES data are available for a subsample of the entire Perry sample (88 of the 123 children). The sample is restricted because the CHES was administered to each mother only once rather than for every child in the sample, and because some mothers could not be reached in the spring of 1966 when the CHES interviews were conducted. Of the 47 experimental group mothers, 40 responded to the CHES; of the 53 control group mothers, 48 responded to the CHES.

Although demographic data were collected at the beginning of each school year and differences between the experimental and control groups were neither anticipated nor found, the Cognitive Home Environment Scale was not administered until all children had been in the sample at least one year and teachers had been visiting the experimental families on a weekly basis for one or two years (spring of 1966). Thus, differences in responses to the CHES from the experimental vs. control group mothers could be anticipated. As seen in Table 2-8, the experimental group's mothers generally gave more favorable responses. Of the 15 CHES items included in Table 2-8, the control group had higher mean scores on two items: "presence and use of dictionary in home" was higher by .1, and "educational use of television" was higher by .2. The two groups had identical mean scores on one item ("proportion of gifts provided for child which are educational"). While the experimental group had higher mean scores on the remaining 12 items, the differences were not great (range from a low of .1 to a high of .8). The greatest differences occurred in the second CHES factor, expectations for child's education. Here the experimental group's mothers expected higher grades and both desired and expected their children to go further in school than the control group's mothers.

Looking at CHES responses averaged for the experimental and control groups combined (plus consideration of an item analysis of the CHES), the following profile emerges.

Availability and use of educational materials in the home. Over 40% of the families did not have (or don't ever use) library cards; about 30% used their library cards between once a week and once a month. The remaining families had cards but used them less than once a month. On the average, the children had seven to nine common household supplies and materials available to them (items like paper, paste, coloring books, etc.). About 35% of the

families lacked dictionaries in their homes; another 45% used their dictionaries between once a week and once a month; the rest used them less frequently. About 25% of the families had encyclopedias in their homes.

Expectations for child's education. Most mothers indicated they expected lower grades in school than actually would have satisfied them (i.e., the average expected grade was between a B- and a C+ while the average grade which would satisfy the parents was a B). This same trend, parents wishing more for (of) their children than they actually expected them to attain, appeared in their expectations regarding the amount of schooling their children would receive. Over 45% of the mothers indicated they would like their children to attend or graduate from college while only about 20% actually expected their children would attend or graduate from college. Less than 2% considered it essential to attend college. About 65% of the mothers considered it essential to graduate from high school, but less than 50% actually expected their children would graduate from high school.

Educational materials provided for child. When asked to itemize presents they had bought for their children for their last birthday and for Christmas, over 50% of the mothers listed no educational toys (books, puzzles, nesting blocks, etc.). On the average, the children received three to four items that were not clothing, food, or money.

Concern for educational activities. About 70% of the mothers indicated that they made no recommendations to their children about what they should watch on television while slightly over 10% tried to have their children avoid non-desirable programs. Over 40% of the mothers indicated no concern with their children's speech. The rest ranged from showing some concern without any effort to change speech habits to concern over a specific problem with specific attempts to correct errors cited.

Educational efforts. When asked about time they spent playing with their children or teaching their children to write, count, or read, the average mothers indicated some time spent daily assisting children in various learning situations. Responses ranged from no attempts to facilitate learning to several hours per day spent assisting the child. About 10% of the mothers responded that they never read to their children while over 20% indicated that they read several times a week or daily to their children.

The Infant and Maternal History Schedule.

Data on the Infant and Maternal History Schedule (Appendix E) came from hospital records written when the children were born. Data for 84 children were collected by a medical student in the spring of 1967. In the spring of 1970, the staff attempted to collect birth data for the rest of the sample. Data were collected for an additional 17 children resulting in a final subsample of 101 (48 experimental children and 53 control children). This subsample has about the same proportions of experimental and control children as the total sample. The control subsample has the same boy/girl ratio as the total control group; the experimental subsample has 3% more boys than the total experimental group. Thus, the subsample does not appear biased insofar as the ratios of experimental to control children or boys to girls.

Of the remaining 22 children for whom no birth data were collected, 5 were either born at home or in a hospital outside the Ypsilanti-Ann Arbor area. The staff couldn't get permission from the rest of the children's mothers to use their hospital records (2 children no longer lived with their mothers and the mothers could not be located; 7 children had moved from the area and their mothers either could not be reached or did not mail back the necessary hospital release forms; and 8 children had mothers [7 mothers] who refused to permit access to their hospital records).

Rather than consider all the birth variables in analyses of the Perry Preschool Project's data, the birth data were summarized in three subscores and a total score. The three subscores were simple sums of 1) the number of complications during the pregnancies, 2) the number of complications during the deliveries, and 3) the number of complications listed under infant morbidity. Additional birth data were not used in the total score. Some of the variables such as the amount of prenatal medical care received by the mother were not recorded for almost half of the mothers. Other variables such as the number of weeks of gestation appeared useless as almost all the hospital records stated 40 weeks for gestation even when the mother had never been to a doctor once during her pregnancy.

Selected data from the Infant and Maternal History Schedule are tabulated in Table 2-9. As expected, the profiles for the experimental and control groups are very similar. The "average" mother had had a total of 4.6

pregnancies (with a range of 1 to 12 pregnancies). Two years had passed from the time she had given birth to the next oldest sibling of the child in the preschool sample (with a range of 9 months to over 8 years). Her average age at the time of the preschool child's birth was 25.3 (with a range of 16 to 40 years). She gained about 26 pounds during the pregnancy (range of 2 pounds to 55 pounds). Almost 20% of the mothers were younger than 18 or older than 35 when their children in the preschool sample were born. Hospital records did not state whether or not 44 of the mothers received any medical care during their pregnancies. Of those having such data recorded, 20 received no medical care. Of the 37 mothers who did have some prenatal care, 70% saw a doctor only once or twice during their pregnancies; less than 20% saw a doctor before the sixth month of pregnancy. The "average" birthweight was 6 pounds, 14 ounces (with a range of 4 pounds, 14 ounces to 9 pounds, 2 ounces), and 15% were premature babies (defined as those babies with birthweights under five pounds, eight ounces*).

The birth data already described include many indications of potential damage to the newborn infants. Among these are: mothers having an excessive number of pregnancies, pregnancies spaced too closely, girls younger than 18 and women older than 35 having babies, mothers receiving inadequate medical care during the prenatal period, and premature and postmature births. Additional indicators of perinatal damage appear in Table 2-9 under "complications during pregnancy" and "infant morbidity". While the percents of mothers and infants experiencing various complications may appear low (0% to 6%), these frequencies are often high when compared with figures for other populations.

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* Although the more precise definition of premature is based on the appropriateness of the infant's weight for his gestational age, it could not be employed because the gestational ages recorded on the hospital records appeared unreliable.

CHAPTER III

Experimental Method

Sample Selection

The population of the Perry Preschool Project was defined as three- and four-year-old children living within the boundary of the Perry School attendance area, coming from "culturally deprived" families, and testing in the range of "educable mentally retarded."

The Perry School attendance area is located in Ypsilanti, Michigan, a community of 50,000 in the fringe of the metropolitan Detroit area. About one-fourth of Ypsilanti's population is black, with few in the middle class or above. For the most part, they live in the southwest section of the city where their children attend Perry School, which, at the start of the project, had an all black student enrollment and was staffed almost entirely by blacks.

The cultural deprivation (C.D.) rating was arrived at using a weighted formula involving parent's education, parent's occupational level, and rooms/person ratio. The rating consisted of:

1. Father's occupation (or mother's if there was no father in the home) on a 1:4 unskilled-to-professional scale.

2. Average years of education completed by the mother and father (or mother only if no father in the home).

3. Density in the home, determined by the rooms/person ratio weighted by a factor of 1/2.

Each component was divided by its standard deviation calculated from the Perry School population to equate the different distributions.* This index is an adaptation of the one used by Martin Deutsch of the Institute of Developmental Research (1962) in New York City to determine a family's socio-economic status. The range of cultural deprivation ratings of Perry families having children of the appropriate age typically varied from about 5 to 17 each year. A cut-off point of 11 was adopted as the upper limit.

* See Appendix A for the exact formula used and a computational example.

Children with a C.D. rating below 11 were examined using the Stanford-Binet Intelligence Scale. Those children evaluated by the examining psychologist as educably mentally retarded, that is, with Stanford-Binet scores below 85, and having no organic involvement were considered eligible for the preschool program.

Eligible children were then assigned to either an experimental or a control group in an essentially random manner, except that the two groups were matched on C.D. ratings and Stanford-Binet scores. Two additional characteristics, boy/girl ratio and percentage of working mothers, were also balanced when possible. Table 3-1 presents group comparisons on matching variables.

Experimental Design

There were essentially four independent variables investigated, but the last two actually consisted of many smaller variables: first, preschool versus no preschool, the experimental treatment; second, boys versus girls; third, selected home background variables; and fourth, certain medical birth complications. In addition, fall entering year cognitive variables were considered to be independent variables for use in some analyses.

Preschool, The Experimental Treatment. The main independent variable was participation in two years of preschool for experimental children, contrasted with no treatment at all (beyond annual testing) for the control children. Experimental children attended preschool half-days, five days a week, from mid-October through May. In addition, teachers visited each experimental child in his home for a ninety-minute instructional session once every week during the school year. Descriptions of specific preschool activities carried on with the experimental children can be found in Volume I of this report.

Five pairs of experimental and control groups were used in five replications of the basic experiment, so as to guard against unusual circumstances in any single year that might contaminate the findings. For convenience, each of the five pairs of experimental and control groups was called a "Wave", and given a number from 0 through 4. Wave 0 and Wave 1 entered together in 1962, and a new wave entered each succeeding year until 1966 when a comparative curriculum project was initiated.* The Wave 0 children were distinguished

* Curriculum Demonstration Project, Ypsilanti Public Schools.

from Wave 1 children because the former entered the project at age four, the latter at age three. Thus, Wave 0 experimental children went directly into kindergarten after one year of preschool, while Wave 1 experimental children and all successive Waves attended two years of preschool before entering kindergarten. Table 3-2 presents the starting time for each Wave, its size, and its grade level for each year.

Originally Wave 0 was designated a pilot wave, to be used for establishing a workable curriculum before the test waves began, and also as "senior preschoolers" to Wave 1. However, since there were more longitudinal data on Wave 0 than on any other wave, it was included with later waves in this report. This decision posed some difficulty in grouping the waves for combined analysis, since all waves except Wave 0 began at age three and participated in two years of preschool. The matter was resolved by overlooking the starting ages of the children and grouping the preschool entering-year data for all children, grouping the preschool second-year data for all children (except, of course, for Wave 0 who had none), grouping the kindergarten data for all children, and so on. This move seemed justified because test results for the initial preschool year were very similar for all children regardless of their ages. Table 3-3 shows how the data were grouped for combined analysis.

From year to year there were changes made in the preschool curricula which apparently affected the experimental group data. These changes evolved as the experimenter's knowledge of effective instructional techniques grew, rather than being systematically manipulated changes, so the decision was made not to formally distinguish among waves because of variations in their preschool experiences.

Following completion of preschool for the experimental groups each year, both experimental and control children entered the regular public kindergarten for the Perry School district of Ypsilanti, Michigan, just as the children would have done if no intervention had occurred. No effort was made to assign children to particular teachers, and no effort was made to alter the elementary school curriculum in any way. In short, after the completion of preschool, absolutely no further intervention occurred other than the annual testing of both experimental and control children. Elementary teachers were not informed of the identity of control or experimental children, and most of them had little or no knowledge of the aims and procedures of the experimental preschool. It should be pointed out, however, that when classes began kindergarten teachers could usually identify experimental children by their classroom comments about preschool experiences.

Table 3-1

Characteristics of Perry Preschool Sample

Group		N	Mean Entry Age (Months)	Mean C.D. Rating	Mean Entry S-B IQ Score	Sex: Boys	Sex: Girls	Working Mothers
Wave 0:	Exp.	13	52.8	8.5	78.4	8	5	1
	Cont.	15	50.7	8.2	75.0	10	5	4
Wave 1:	Exp.	8	40.2	8.5	79.3	5	3	1
	Cont.	9	39.4	8.3	78.3	6	3	3
Wave 2:	Exp.	12	40.2	8.2	81.1	4	8	3
	Cont.	14	40.0	8.3	79.4	7	7	3
Wave 3:	Exp.	13	38.9	8.4	79.7	8	5	0
	Cont.	14	39.3	8.3	80.8	10	4	5
Wave 4:	Exp.	12	40.2	8.6	79.4	7	5	1
	Cont.	13	38.5	8.5	79.4	6	7	4
All Waves 0-4:	Exp.	58	42.9	8.4	79.6	32 55%	26 45%	6 10%
	Cont.	65	42.0	8.3	78.5	39 60%	26 40%	19 29%

Table 3-2

Annual Grade Status of Groups to 1967

			School Year				
		Group Size	1962-1963	1963-1964	1964-1965	1965-1966	1966-1967
WAVE 0	E	13	Preschool	KDG	1st	2nd	3rd
	C	15	1st year				
WAVE 1	E	8	Preschool	Preschool	KDG	1st	2nd
	C	9	1st year	2nd year			
WAVE 2	E	12		Preschool	Preschool	KDG	1st
	C	14		1st year	2nd year		
WAVE 3	E	13			Preschool	Preschool	KDG
	C	14			1st year	2nd year	
WAVE 4	E	12				Preschool	Preschool
	C	13				1st year	2nd year

Table 3-3

Wave Grouping for Analysis

Test Dates	FEY, SEY	S2Y	SKG	S1G	S2G	S3G
WAVE 0	Preschool Year 1		KDG	1st	2nd	3rd
WAVE 1	Preschool Year 1	Preschool Year 2	KDG	1st	2nd	
WAVE 2	Preschool Year 1	Preschool Year 2	KDG	1st		
WAVE 3	Preschool Year 1	Preschool Year 2	KDG			
WAVE 4	Preschool Year 1	Preschool Year 2				
Total N	E 69 C 75	E 45 C 50	E 46 C 52	E 33 C 38	E 21 C 24	E 13 C 15

There were no important differences between the experimental and control groups regarding the schools and classes they attended after entering the public school system. Of the ninety-eight children in Waves 0 through 3 who have completed at least one year of public school, only thirteen--seven experimental and six control--did not attend Perry School during kindergarten (Table 3-4). Of the thirteen children not attending Perry School, all but one experimental child and three control children attended other local schools, with the four exceptions going to Detroit, Saginaw, and Inkster, Michigan, public schools. In each succeeding grade a larger percentage of the children moved to other schools, and within Perry School itself the children were distributed among more teachers per year (Table 3-4 and 3-5). Although the post-kindergarten environments for project children became increasingly diverse, no systematic differences emerged between the experimental and control groups.

Home background variables. Home background data were collected using the Cognitive Home Environment Scale (CHES), Inventory of Attitudes of Family Life and Children (Inventory), and Perry Demographic Questionnaire, which are presented in Appendices D, C, and B. Because of the large number of variables contained in these instruments, results for only some of the instruments, or parts of the instruments, are presented in this report.

Classifying some of the home background variables as either independent or dependent variables was difficult. Data from some home background variables were relatively unaffected by the experimental procedure, including variables such as the cultural deprivation rating, parent's education, parent's age, older and younger siblings, size of house, and so on. However, it was theoretically possible for some home variables to change during the course of preschool because of the increased involvement of parents with teachers and examiners. Examples of this type of variable are parent's attitudes toward education, availability of educational materials in the home, and parent's image of teachers. Because of this, it was not clear whether these variables properly belonged with the dependent variables or with the independent variables, but a decision was arrived at by necessity: most of these measures were taken after the start of preschool, that is, after the hypothesized changes would have taken place, so they were treated as independent variables in spite of indications that they might have been somewhat dependent upon the experimental treatment.

Table 3-4

School Location Following Preschool

		Kinder-garten		First Grade		Second Grade		Third Grade	
		Perry	Other	Perry	Other	Perry	Other	Perry	Other
WAVE 0	E	13	0	13	0	11	2	8	5
	C	15	0	15	0	14	1	10	5
WAVE 1	E	7	1	7	1	5	3		
	C	9	0	8	1	4	5		
WAVE 2	E	9	3	5	7				
	C	11	3	10	4				
WAVE 3	E	10	3						
	C	11	3						
(Wave 4 was not yet registered in school at the completion of the project in 1967)									
COMBINED WAVES	E	39	7	25	8	16	5	8	5
	C	46	6	33	5	18	6	10	5

Table 3-5

Distribution of Perry Public School Children Among Teachers

		Kinder-garten		First Grade									Second Grade							Third Grade			
Teacher:		A	B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	K	R	S	M
WAVE 0	E	4	9		3	2				1	5	2			1	2	1	3	4		5	2	1
	C	8	7		6	4					1	4			1	6	5	2		1		8	1
WAVE 1	E	1	6		5	1			1				4	1									
	C	7	2	1	1	2		4					1	2	1								
WAVE 2	E	4	5		1	1	1	2															
	C	5	6			3	3	4															
WAVE 3	E	3	7																				
	C	7	4																				

(Wave 4 was not yet registered in school at the completion of the project)

COMBINED WAVES	E	12	27	0	9	4	1	2	1	1	5	2	4	1	1	2	1	3	4	0	5	2	1
	C	27	19	1	7	9	3	8	0	0	1	4	1	2	2	6	5	2	0	1	0	8	1

Birth Variables. Data on medical birth complications were collected for a subsample of 101 of the 123 Perry Project children, including information about both the mother and infant. The maternal variables included pregnancy complications (such as hypertension, toxemia, etc.), and delivery complications (Caesarian section, breech delivery, etc.). Infant variables included birth weight and natal complications (delayed respiration, convulsions, etc.). These data were collected from hospital records in the follow-up phase of the project, after all children had completed preschool. Further information is presented in Appendix E.

Dependent Variables

The dependent variables were separated into three categories: 1) cognitive variables; 2) achievement variables; and 3) socio-emotional variables. Data on the variables were collected in the fall before the children entered the project, and every spring thereafter until the third grade. For convenience, the following notation is used to describe the times that the various instruments were administered:

Preschool:	FEY (Fall entering year)
	SEY (Spring entering year)
	S2Y (Spring second year)
Public School:	SKG (Spring kindergarten)
	S1G (Spring first grade)
	S2G (Spring second grade)
	S3G (Spring third grade)

Cognitive variables were measured using four different instruments, the principle measure being the Stanford-Binet Intelligence Scale, Form LM. The Arthur Adaptation of the Leiter International Performance Scale was used as a measure of non-verbal ability, coupled with the Peabody Picture Vocabulary Test as a measure of verbal ability. The Experimental Edition of the Illinois Test of Psycholinguistic Abilities was included to provide normative data on the language deficiencies of culturally deprived children as they progressed through the preschool's language program. These four instruments were administered to all children upon entering the project, and annually each spring thereafter except where missing from the tables.

Achievement variables were collected after the children entered elementary school. The California Achievement Tests were used as a measure of general academic functioning, the most important dependent variable in terms of the objectives of remedial programs. The Lower Primary battery was administered in grades one and two, and the Upper Primary battery in grade three. The Gates Reading Tests were administered in kindergarten, first, and second grades; however, because of the non-comparability of tests from year to year and related shortcomings, results of the Gates tests are not presented in this report. Since the Gates tests are no longer commercially available, discussion of the tests has been eliminated from the Appendix also.

Socio-emotional data about the children were collected from teachers using two rating scales, the Pupil Behavior Inventory and the Ypsilanti Rating Scale, each having five factors describing the child's academic and social adjustment within the classroom setting. Factors on the Pupil Behavior Inventory are Classroom Conduct, Academic Motivation, Socio-Emotional State, Teacher Dependence, and Personal Behavior. Ypsilanti Rating Scale factors are Academic Potential, Mother Participation, Social Development, Verbal Skill, and Emotional Adjustment. The two scales are presented in Appendices F and G. These instruments were used to assess the experimental group every year, including both years of preschool, but because they were "teacher" ratings no data could be collected for the control groups until kindergarten. Only test results based on comparable data for both groups were discussed in this report.

Data Collection

In order to identify eligible children each year, names of all three-year-old children living within the Perry School District were taken from the public school census. Then parents of each child were visited by one of the preschool teachers to obtain the information necessary to calculate a cultural deprivation rating for the family. A second visit was made to all families falling below the C.D. rating cutoff point to get permission to test their children with the Stanford-Binet. For those falling below the Stanford-Binet cutoff point, assignment to either the experimental or control group was made and teachers notified parents of the status of their children and obtained final permission. At this stage there were only about three refusals over the five year period of the project.

The annual testing was performed by qualified testers who had completed formal training in the administration of individual intelligence tests. In the interest of keeping data collection as objective as possible, outside testers who knew little about the project were hired for several weeks each spring. Typically these testers were advanced doctoral students studying educational psychology at the University of Michigan. From time to time it was necessary for staff testers to assist with test administration, but insofar as possible testing was left to neutral outsiders.

To inform testers about their role in the project, one or two pre-sessions were held in which a project staff member explained the testing procedures and the importance of objective and unbiased participation. Each of the tests was discussed, item by item, to refresh testers' memories and clarify potential areas of difficulty. For all children, both experimental and control, testers were instructed to develop good rapport with the children, and to make conditions as favorable as possible within the limits of standardization so the children would be encouraged to make their maximum possible score. In keeping with this instruction, children who tended to give up quickly were to be reassured by the testers and encouraged to keep on trying until the testers were convinced that the children had performed as well as the situation allowed. Children who for one reason or another were untestable on a scheduled day were to be re-scheduled for another attempt.

To minimize the possible confounding effects of tester differences, children from both experimental and control groups, from different waves, from both sexes, and so on, were assigned to each tester in as balanced a manner as possible within the ever-present scheduling constraints. Testers were not informed whether the children assigned to them were experimental or control, but often the child himself or the circumstances of the test would indicate which group individual children were in. Since the testers were predominantly outsiders, however, even if they did learn the status of particular children they had little interest whether the results were favorable to the project or not.

All of the children in the Perry Project were black, but few of the testers were black. Although this may have had an effect on the absolute level of scores obtained, relative differences between the experimental and control groups should not have been affected because children were

assigned to testers in a balanced manner. Analyses in this report are almost entirely based on comparisons of the relative performance of experimental to control children, minimizing the importance of possible racial tester effects. Early in the project this problem was investigated statistically and no significant tester differences were found, further minimizing its importance.

The four cognitive tests were given in two sessions, with the Peabody and Stanford-Binet typically paired for one session, and the Leiter and ITPA paired for the second. The Peabody and Leiter tests helped establish rapport quickly, and the total length of each session was easily manageable by most of the children. Although capable of being administered by teachers to entire classes, the California Achievement Tests were administered by trained testers to groups of six or less. The child rating scales used to collect socio-emotional data were completed by teachers near the end of each school year. Results of the tests were not released to parents or teachers, but only to school diagnosticians or other qualified persons who requested information about particular children.

The retention rate of project children in the longitudinal evaluation has been very high. In the last data collection, over 90% of the original sample were once again tested. The unusually high follow-up rate can be partly attributed to the research staff's determination to include all children who could be located, (involving tests as far away as Boston or California) and partly attributed to the relatively low mobility of the people living in the Perry School District during the years in which the project was conducted. In recent years there has been a noticeable trend toward increased mobility, making longitudinal follow-up more difficult. The investigators intend to follow the Perry Project children through high school, and into adult life if circumstances permit. Tests beyond the third grade are scheduled at progressively less frequent intervals.

Data Processing

After tests were collected and scored by the testers, data processing personnel re-scored the tests to verify the original results. Then the scores were punched onto IBM cards, and listings of the cards were re-verified against the original test booklets. After all discoverable errors were removed from the punched cards, statistical analysis began.

All statistical calculations were performed on the IBM 360/67 computer at the University of Michigan Computing Center. Although the computer was essential to handle the massive amounts of data which were run through complex statistical techniques, the use of computer processing was not without its own unique problems. Errors had to continually be guarded against through careful sequencing of setup steps and continual cross-checking. For each run reported in writing, a computer listing was made of all data cards and setup cards so that the listing could be checked for completeness and accuracy and then stored for future reference in case later questions should arise. The program computational outputs were checked to make sure the values calculated were reasonable for the variables entered, and, if possible, cross-checked with other outputs using the same variables. Calculations on which the most important conclusions in this report were based were checked especially thoroughly. Quality control of the computer processing was a continual struggle, and many errors were detected and setups rerun before arriving at the results presented in this report. In spite of all the precautions, however, the possibility still exists that some errors escaped detection. If any inconsistencies among the results of different tables are discovered, the authors would appreciate notification.

Statistical Analysis

In addition to routine descriptive statistics (means, standard deviations, frequency counts, etc.), three statistical techniques were used to analyze the data: analysis of variance, stepwise regression, and product-moment correlation. Analysis of variance was used to determine whether differences occurred between experimental and control children on each of the dependent variables. Because it is not only possible but typical to have statistically significant differences which have no practical importance whatever, regression analysis was used to calculate the proportion of variance on selected dependent variables that could be explained by knowing whether a child was experimental or control; in addition, by using stepwise regression, key independent variables could be empirically ranked on their ability to explain variance of the dependent variables. Thus these two statistical techniques answer the questions, "Did preschool make a difference?" and "How important was the difference?" Finally, correlation analysis was used to explore the data for possible interrelationships that could lead to new hypotheses for future experimental investigation.

Analysis of Variance. A three-way design was used for the analysis of variance results presented in Chapter IV, in which the first factor compared experimental to control, the second factor compared boys to girls, and the third factor compared waves. The data matrix for this design is presented in Table 3-6. Only the results for the group and sex factors are presented in this report; the wave factor was added primarily to reduce the error variance due to overall annual differences, thus improving the power of the test, rather than for its theoretical interest. The general configuration presented in Table 3-6 was used at each of the seven points in time for which data were available, from fall entering year of preschool through the spring third grade; however, the number of waves having data successively decreased at each point in time so the number of levels in the wave factor had to be adjusted accordingly.

Data collection will be complete when all waves have reached the third grade, and at that time a four-factor analysis of variance design will be considered to replace the three-factor design presented here. The additional factor would be a repeated measure factor having each data collection point from preschool through third grade constitute a level. Such a configuration would allow trend analyses of time changes which are not possible with the current configuration. It would also allow a comparison of longitudinal effects, cross-sectional effects, and cohort (generational) effects as suggested by Baltes (1968).

The computer program used to perform the analysis of variance computations was adapted from Veldman (1967) for use on the IBM 360/67 computer. Alterations to the program, AVAR23, involved only machine-specific adaptations and minor rearrangement of output, so that the actual computational procedures are precisely those given by Veldman. Questions relating to the computational procedure can be answered by referring to Veldman's program description, or if necessary, to the source program printout included in his book. The main reasons for using program AVAR23, in addition to its statistical appropriateness and setup convenience, were the features permitting missing data and unequal numbers of subjects per cell. The latter feature was accomplished using the "unweighted means" technique described by Winer (1962).

In addition to tests of main and interaction effects, some post hoc comparisons were calculated using Scheffe's method (Hays, 1963).

Table 3-6

Typical Analysis of Variance Data Matrix
(Fall Entering Year Configuration)

		WAVE 0	WAVE 1	WAVE 2	WAVE 3	WAVE 4
Experimental Group	Boys					
	Girls					
Control Group	Boys					
	Girls					

Regression analysis. In order to assess the predictive importance of the independent variables, a stepwise regression technique was used. Two of the three independent variables examined in the analysis of variance design, group and sex, were selected because of their a priori theoretical interest but were not necessarily the most important predictive variables. Other variables, such as the home background items, did not lend themselves easily to analysis of variance designs; moreover, even if they did, complex intercorrelations among the independent variables would produce F-test results that were mutually dependent, pushing Type I error rates excessively high.

The stepwise regression technique provides, in some circumstances, identically equivalent F-tests as those performed in traditional analysis of variance designs. In addition, however, the technique calculates the proportion of non-overlapping variance in the dependent variable that can be predicted by each of the most important independent variables, giving both an absolute and a relative estimation of the predictive importance of each variable. Regression permits the use of either categorical independent variables, such as those commonly used in analysis of variance designs, or of continuous independent variables, which are not directly usable in analysis of variance designs. The problem of complex intercorrelations among the independent variables is handled by the "search and isolate" characteristics of the program: first, all predictor variables are searched and the one that predicts the most variance in the dependent variable is identified, its proportion of predicted variance calculated, an F-test for the significance of the predicted variance is calculated, then any shared variance is removed from the remaining variables rendering them completely independent of the variable removed; then, this process is repeated for the next most important variable, the next, and so on until the remaining variables account for only insigificant proportions of variance. The end result of this process is a hierarchy of independent variables, ordered by predictive importance, tested with F-tests for statistical importance, and easily interpretable.

Although it appears in theory that every possible independent variable collected in this project could have been entered into the stepwise regression program, in practice there are definite limitations on the number that may be analyzed at one time. In the first place, there can be no more predictor variables than there are children having scores on the dependent variable. Secondly, to the extent that the number of predictor variables approach the number of children, the results lose repeatability when validated with new groups

of children. Thus a relatively small number of predictor variables is desirable. In this study the independent variables used as predictors were selected according to one of two criteria: either the variable was of such overriding a priori theoretical importance that it was considered essential, or, in a few cases, examination of preliminary correlation results suggested that it might have an important relationship to the dependent variable. Admittedly, the second criterion capitalized on chance by allowing only the most important post hoc variables to be entered into regression analysis. However, in view of the exploratory nature of this project and the importance of assessing the relative contribution of any independent variable that could possibly be important, strict adherence to .05 Type I error rates was loosened. The same reasoning underlies the presentation of analysis of variance probability levels of .10 in the tables of Chapter IV.

Subject scores were grouped in three ways for use in regression analysis. In order to assess the importance of the preschool experience relative to other independent variables, the entire sample was used in the first regression analysis. Then, in order to assess the order of importance of predictors for children having preschool and compare it to the order of importance for children not having preschool, the experimental sample alone was used for the second analysis and the control sample alone for the third.

Computations for the regression analysis were performed using UCLA Biomedical program BMD02R, Stepwise Regression, altered for use on the IBM 360/67 computer by the Rackham Statistical Research Laboratory, University of Michigan. The computational procedure used in the program is documented in Dixon (1968).

Correlation analysis. As is customary with exploratory projects, "everything-by-everything" correlation matrices were obtained and scanned for new leads, and for whatever interest they may have to readers most of the correlations are presented in this report. With the enormous number of correlations possible using computer techniques, overinterpretation of isolated significant correlations becomes a serious hazard. With any large number of significance tests, especially when performed on interdependent correlation coefficients, the probability that at least some of the coefficients are significant by chance alone approaches 1.00 (that is, it is almost a certainty that some of the significant correlations are chance events). Regression techniques avoid this problem by partialling out common variance as

new variables are added to the regression equation, but the number of variables that can be accommodated using regression is far smaller than the total number of variables collected. Thus wholesale correlation has its place, but must be interpreted with caution and common sense. In general, large correlations of one variable with another were not given undue attention unless they appeared as part of a trend occurring consistently across several years, or appeared as part of a trend occurring consistently across a class of related variables, or appeared to make compellingly good intuitive sense.

The t-test for significance used on the correlation coefficients tests whether the correlation is significantly different from 0.00 (Hays, 1962, p. 529). When using this test with a moderate number of subjects, relatively small correlations (e.g., r = .30) will be significant at the .05 level; such correlations could hardly be considered important when it is remembered that only 9% of the variance is accounted for, and, moreover, this variance is shared with an extremely large number of other overlapping variables. Therefore, for correlation matrices based on samples greater than 30 or so subjects, significance at the .05 level should only be considered a lower boundary condition, separating scores to be ignored completely from those worthy of further examination using the consistency criteria mentioned above. Conversely, when sample sizes are very small, correlations above .60 or .70 may fail to reach significance yet may be important; conclusions based on such correlations require additional data before gaining full respectability, but can be tentatively accepted if they meet the consistency criteria.

Computations were performed using the staff-written calling program MDI2, which contained input/output facilities along with the t-test for significance, and subroutine MDRS from Veldman (1967), which calculated Pearson product-moment correlation coefficients. Subroutine MDRS has the extremely useful capability of adjusting calculations to accommodate unequal numbers of subjects on different variables. Product-moment correlations as calculated by the program were used throughout, even on dichotomous data, because of the equivalence of P-M correlations with phi, point-biserial, and rho correlations (Nunnally, 1967, pp. 118-124).

CHAPTER IV

Results

Analysis of Variance Results

Cognitive Test Results

Stanford-Binet Intelligence Scale (S-B). The group means* and F-ratios from the Stanford-Binet analysis of variance are presented in Table 4-1. The experimental means were higher than the control means at every point in time, with sharply emerging differences after one year of preschool followed by gradually declining differences. The entering difference between the experimental and control groups was not significant since they were initially matched on S-B scores, but at the end of the first year of preschool the difference between groups was highly significant in favor of the experimental group. The difference remained significant through the second year of preschool, through kindergarten, and through first grade. By the end of the second grade, however, and continuing through the third grade, differences had disappeared and the two groups looked essentially alike.

None of the overall sex differences were significant, with F-ratios at all dates except FEY being less than 1. The S2G group-by-sex means suggest that differences were developing between the experimental girls and the other three groups, but there were no significant main or interaction effects, and preliminary inspection of later data revealed reduced differences.

* It should be pointed out that the computer program from which the means in this chapter were taken used the unweighted means method (Winer, pp. 222-224) for accomodating the unequal numbers of subjects in cells of the analysis of variance data matrix. This means that the reported means may be slightly different from the true means, especially if there are large differences in the numbers of subjects in each cell. This difference occurs because cell means, rather than individual subjects' scores, were used to compute the between-groups sum of squares. Note that whenever the cells contain equal numbers of subjects the two methods will yield identical results.

Arthur Adaptation of the Leiter International Performance Scale (Leiter). Following the pattern set by the Stanford-Binet, the experimental means were higher than the control means at every point in time, with sharply increased differences after the first year of preschool followed by gradually declining differences (Table 4-2). However, here the trend was complicated by the presence of a significant difference at the FEY test date. This difference can be attributed to the fact that the entering Leiter was administered after preschool started in the fall, sometimes as late as two months after, giving the experimental group an advantage on the test. Regardless of the cause of the initial difference, the considerably larger difference between experimental and control children at the end of the first year leaves no room for doubt that the preschool had an impact on the experimental children. A significant difference was maintained one more year, but disappeared during kindergarten, first and second grades. Surprisingly, a significant difference between the experimental and control groups again appeared at the end of the third grade. The group-by-sex cell means at S2G on Table 4-2 reveal that this difference is largely attributable to the experimental girls, resembling the results of the Stanford-Binet (Table 4-1), although more pronounced and slightly displaced in time.

The only sex difference occurred at the end of the first year when the boys scored significantly higher than the girls. However, this difference was weak and did not maintain itself suggesting that it may have been a chance occurrence.

Peabody Picture Vocabulary Test (PPVT). The PPVT results closely parallel the Stanford-Binet and Leiter results showing consistent experimental superiority, except for a reversal at S3G. Also, like the Leiter, there was a significant difference at FEY which might have resulted from administering the PPVT after the start of preschool. In spite of entering differences the preschool had an important effect, more than doubling the magnitude of the F-ratio from the FEY to the SEY test dates, and more than doubling it again to the S2Y test date. At the end of kindergarten there was still a significant difference between groups, but it was of approximately the same magnitude as the FEY difference. The last significant difference occurred at the S1G test date, again of approximately the same magnitude as the entering difference. Beyond the second grade the two groups looked essentially alike, with both the S2G and the S3G F-ratios less than 1.

No sex differences appeared until the end of kindergarten, repeated after the first grade, when the boys performed significantly better than the girls. Although the F-ratios did not reach significance in the second and third grades, the boys clearly maintained their superiority over the girls on the PPVT. The S2G test date appeared to be a crossover point where the experimental and control groups were about equal, after which the control group performed better than the experimental group although the sex differences were more distinct than the group differences. The experimental girls did surprisingly poorly on the PPVT at these test dates in contrast to their relatively good performance on the S-B and Leiter at the same test dates.

Experimental Edition of the Illinois Test of Psycholinguistic Abilities (ITPA). There was only one significant difference between groups using the ITPA Total Score, which occurred at the S2Y test date (Table 4-4). Note that the ITPA was not administered at the end of the first year. Looking into the subtest scores, all but one exhibited essentially the same results as the total score. The one notable exception was the Auditory-Vocal Association subtest, for which the experimental group was significantly better than the control group at every point in time except the S3G test date (Table 4-4a). The differences on this subtest appear to be too systematic and pronounced to be dismissed as chance events, so that this subtest appears to yield different information than the rest of the subtests. The initial FEY significant difference on this subtest may be logically attributed to the fact that, like the PPVT and Leiter, the test was administered after the start of preschool, giving the experimental children an advantage.

The ITPA Total Score did not reveal any significant differences between boys and girls, nor did six of the nine subtests. The remaining three subtests, Visual Decoding, Motor Encoding, and Auditory-Vocal Sequencing, each revealed one or two isolated significant differences but no systematic trends. This suggests they may have been chance events.

Achievement Test Results

California Achievement Test (CAT). The means for the CAT Total raw score (Table 5) were significantly different in favor of the experimental group at the end of the first grade, and the means grew increasingly different as the children finished second grade and third grade.

Explanation of Analysis of Variance Tables

In an effort to condense essential information as much as possible, but still maintain ease of understanding, a standard one-page format was adopted for presentation of analysis of variance results. Features of the tables are explained below; the overall design is described in Chapter III.

1. Seven points in time are represented from left to right across each page. The following abbreviations were used:

Preschool	FEY	(Fall entering year)
	SEY	(Spring entering year)
	S2Y	(Spring second year)
Public School	SKG	(Spring kindergarten)
	S1G	(Spring first grade)
	S2G	(Spring second grade)
	S3G	(Spring third grade)

2. Each page can be viewed as a series of two-by-two analysis of variance tables for the same instrument across the seven points in time. Each two-by-two table has experimental versus control as levels of the group factor, and boy versus girl as levels of the sex factor:

		Sex: Boys	Sex: Girls
Group	Experimental		
	Control		

3. Reading down the columns at each point in time, the means, F-ratios, and significance levels are presented for the group main effect, the sex main effect, and the group-by-sex interaction. For example, for the fall entering year (FEY) test date on the Stanford-Binet (Table IV-1), the total experimental group mean (boys and girls combined) was 79.7, and the total control group mean was 79.1. The F-ratio for the difference was less than one, which was not significant.

4. At the bottom of the column for each test date, the number of children in each of the four groups in the two-by-two design is presented, followed by the combined total. For the example above, there were 58 experimental children (33 boys + 25 girls) and 65 control children (39 boys + 26 girls). Cell sizes decreased across time because later waves had not yet reached the higher grades at the close of the project (see Chapter III). Results for data collected up to spring 1967 were included in the tables.

5. For clarity, identical table formats were used for all instruments. If the column below a test date is empty for any instrument, it means that the instrument was not collected at that point in time.

TABLE 4-1

Stanford-Binet Intelligence Scale
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.	79.7	95.8	94.7	90.5	91.2	88.8	89.6
Total Cont.	79.1	83.4	82.7	85.4	83.3	86.5	88.1
F-Ratio (Group Main Effect)	<1	39.78	25.36	4.58	8.26	<1	<1
Significance	NS	.01	.01	.05	.01	NS	NS
SEX MEANS:							
Total Boys	78.7	89.4	89.8	87.1	87.5	86.3	88.5
Total Girls	80.1	89.8	87.7	88.8	86.9	89.1	89.2
F-Ratio (Sex Main Effect)	1.31	<1	<1	<1	<1	<1	<1
Significance	NS	NS	NS	NS	NS	NS	NS
GROUP x SEX CELL MEANS:							
Exp. Boys	79.5	95.6	94.8	90.6	91.2	85.0	88.0
Exp. Girls	80.0	95.9	94.7	90.4	91.2	92.7	91.2
Cont. Boys	78.0	83.1	84.8	83.7	83.9	[illegible]	88.9
Cont. Girls	80.2	83.7	80.7	87.2	82.7	85.5	87.2
F-Ratio (G x S Interaction)	<1	<1	<1	<1	<1	1.59	<1
Significance	NS	NS	NS	NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys	33	33	25	25	17	13	8
Exp. Girls	25	25	19	20	16	8	5
Cont. Boys	39	39	29	33	22	16	10
Cont. Girls	26	26	20	19	15	8	5
Total	123	123	93	97	70	45	28

*See page 64 for an explanation of this table.

TABLE 4-2

Leiter International Performance Scale (Arthur Ad.)
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.		68.6	96.6	89.4	84.3	86.1	88.0	91.4
Total Cont.		59.3	72.4	77.6	81.4	86.3	87.9	84.2
F-Ratio (Group Main Effect)		6.52	36.33	16.65	1.29	<1	<1	3.87
Significance		.05	.01	.01	NS	NS	NS	.10
SEX MEANS:								
Total Boys		61.4	87.9	85.5	82.8	86.8	85.3	87.3
Total Girls		66.5	81.1	81.4	82.9	85.6	90.7	88.3
F-Ratio (Sex Main Effect)		2.00	2.87	1.99	<1	<1	2.37	<1
Significance		NS	.10	NS	NS	NS	NS	NS
GROUP x SEX CELL MEANS:								
Exp.	Boys	53.9	98.3	89.6	82.8	86.5	83.9	87.1
	Girls	73.3	94.8	89.1	85.8	85.8	92.1	95.6
Cont.	Boys	58.9	77.5	81.4	82.8	87.2	86.7	87.4
	Girls	59.8	67.4	73.7	80.1	85.4	89.2	81.0
F-Ratio (G x S Interaction)		1.42	<1	1.52	1.23	<1	<1	4.17
Significance		NS	NS	NS	NS	NS	NS	.05
GROUP x SEX CELL SIZES (N):								
Exp.	Boys	33	20	25	25	17	13	8
	Girls	25	17	19	20	16	8	5
Cont.	Boys	38	23	29	33	22	16	10
	Girls	26	18	20	18	15	8	5
	Total	122	78	93	96	70	45	28

*See page 64 for an explanation of this table.

TABLE 4-3

Peabody Picture Vocabulary Test
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.	67.0	74.1	81.4	78.2	83.5	81.7	76.3
Total Cont.	62.2	63.0	61.6	71.8	76.6	80.4	79.4
F-Ratio (Group Main Effect)	5.05	11.97	27.85	4.21	4.30	<1	<1
Significance	.05	.01	.01	.05	.05	NS	NS
SEX MEANS:							
Total Boys	64.3	70.9	74.5	77.6	83.8	84.5	81.5
Total Girls	64.8	66.2	68.5	72.3	76.3	77.6	74.2
F-Ratio (Sex Main Effect)	<1	2.20	2.48	2.94	5.16	1.92	2.02
Significance	NS	NS	NS	.10	.05	NS	NS
GROUP x SEX CELL MEANS:							
Exp. Boys	65.5	75.6	83.9	81.2	86.3	86.0	80.3
Exp. Girls	67.4	72.6	78.9	75.1	80.6	77.3	72.4
Cont. Boys	62.1	66.3	65.0	74.1	81.3	83.0	82.8
Cont. Girls	62.3	59.7	58.2	69.5	71.9	77.9	76.0
F-Ratio (G x S Interaction)	<1	<1	<1	<1	<1	<1	<1
Significance	NS	NS	NS	NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys	33	20	25	25	17	13	8
Exp. Girls	25	17	19	20	16	8	5
Cont. Boys	36	23	29	33	22	16	10
Cont. Girls	24	18	20	19	15	8	5
Total	118	78	93	97	70	45	28

*See page 64 for an explanation of this table.

TABLE 4-4

ITPA Total Language Age
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION					
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.	2.8		4.7	5.2	6.1	6.8	7.7
Total Cont.	2.6		3.9	5.0	5.8	6.6	7.4
F-Ratio (Group Main Effect)	2.46		35.68	<1	2.29	<1	<1
Significance	NS		.01	NS	NS	NS	NS
SEX MEANS:							
Total Boys	2.7		4.4	5.2	5.9	6.8	7.5
Total Girls	2.6		4.3	5.0	5.9	6.6	7.6
F-Ratio (Sex Main Effect)	<1		<1	<1	<1	<1	<1
Significance	NS		NS	NS	NS	NS	NS
GROUP x SEX CELL MEANS:							
Exp.	Boys	2.7		4.7	5.3	6.0	6.9	7.3
	Girls	2.8		4.7	5.1	6.1	6.7	8.1
Cont.	Boys	2.7		4.0	5.1	5.9	6.7	7.7
	Girls	2.5		3.8	5.0	5.7	6.4	7.1
F-Ratio (G x S Interaction)	1.32		<1	<1	<1	<1	2.22
Significance	NS		NS	NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp.	Boys	33		25	25	17	13	8
	Girls	23		19	20	16	8	5
Cont.	Boys	39		27	33	22	16	10
	Girls	26		20	18	15	8	5
	Total	121		91	96	70	45	28

*See page 6k for an explanation of this table.

TABLE 4-4a

ITPA Auditory-Vocal Association
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.		2.9		4.4	5.1	6.3	6.7	7.4
Total Cont.		2.6		3.4	4.6	5.5	6.3	7.1
F-Ratio (Group Main Effect)		5.42		41.53	8.30	9.52	3.41	<1
Significance		.05		.01	.01	.01	.10	NS
SEX MEANS:								
Total Boys		2.8		4.0	4.9	6.0	6.6	7.2
Total Girls		2.8		3.8	4.8	5.8	6.4	7.3
F-Ratio (Sex Main Effect)		<1		<1	<1	1.04	<1	<1
Significance		NS		NS	NS	NS	NS	NS
GROUP x SEX CELL MEANS:								
Exp.	Boys	2.8		4.4	5.2	6.2	6.6	7.1
	Girls	2.9		4.4	5.1	6.4	6.8	7.6
Cont.	Boys	2.7		3.5	4.7	5.8	6.5	7.3
	Girls	2.6		3.3	4.5	5.1	6.0	7.0
F-Ratio (G x S Interaction)		1.32		<1	<1	2.73	1.85	1.60
Significance		NS		NS	NS	.10	NS	NS
GROUP x SEX CELL SIZES (N):								
Exp.	Boys	33		25	25	17	13	8
	Girls	23		19	20	16	8	5
Cont.	Boys	39		27	33	22	16	10
	Girls	26		20	18	15	8	5
	Total	121		91	96	70	45	28

*See page 64 for an explanation of this table.

TABLE 4-5

California Achievement Test Total Raw Score
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.						90.7	146.0	199.9
Total Cont.						71.5	121.2	116.5
F-Ratio (Group Main Effect)						4.27	2.92	11.61
Significance						.05	.10	.01
SEX MEANS:								
Total Boys						74.1	110.3	137.0
Total Girls						88.2	156.9	179.3
F-Ratio (Sex Main Effect)						2.29	10.34	2.98
Significance						NS	.01	.10
GROUP x SEX CELL MEANS:								
Exp.	Boys					76.6	115.6	162.1
	Girls					104.8	176.3	237.6
Cont.	Boys					71.6	104.9	111.9
	Girls					71.5	137.5	121.0
F-Ratio (G x S Interaction)						2.32	<1	1.83
Significance						NS	NS	NS
GROUP x SEX CELL SIZES (N):								
Exp.	Boys					17	12	8
	Girls					16	8	5
Cont.	Boys					22	15	10
	Girls					15	8	5
	Total					70	43	28

*See page 64 for an explanation of this table.

TABLE 4-6a

PBI Classroom Conduct
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.				3.6	3.7	3.7	3.8
Total Cont.				3.6	3.3	3.5	3.3
F-Ratio (Group Main Effect)				<1	5.63	<1	2.45
Significance				NS	.05	NS	NS
SEX MEANS:							
Total Boys				3.4	3.3	3.2	3.0
Total Girls				3.7	3.7	3.9	4.0
F-Ratio (Sex Main Effect)				4.94	4.69	5.29	12.83
Significance				.05	.05	.05	.01
GROUP x SEX CELL MEANS:							
Exp. Boys				3.6	3.4	3.3	3.3
Exp. Girls				3.7	4.0	4.0	4.2
Cont. Boys				3.3	3.1	3.2	2.8
Cont. Girls				3.8	3.4	3.8	3.9
F-Ratio (G x S Interaction)				2.34	<1	<1	<1
Significance				NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys				25	17	13	8
Exp. Girls				20	16	8	5
Cont. Boys				31	22	16	10
Cont. Girls				19	15	7	5
Total				95	70	44	28

*See page 64 for an explanation of this table.

TABLE 4-6b

PBI Academic Motivation
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.				3.1	3.4	3.3	3.3
Total Cont.				2.8	2.9	2.7	2.9
F-Ratio (Group Main Effect)				1.51	4.18	3.08	1.66
Significance				NS	.05	.10	NS
SEX MEANS:							
Total Boys				3.0	3.1	2.7	2.7
Total Girls				2.9	3.2	3.2	3.4
F-Ratio (Sex Main Effect)				<1	<1	2.21	4.93
Significance				NS	NS	NS	.05
GROUP x SEX CELL MEANS:							
Exp. Boys				3.1	3.2	2.8	2.8
Exp. Girls				3.0	3.6	3.8	3.7
Cont. Boys				2.8	2.9	2.6	2.7
Cont. Girls				2.9	2.9	2.7	3.1
F-Ratio (G x S Interaction)				<1	<1	1.59	<1
Significance				NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys				25	17	13	8
Exp. Girls				20	16	8	5
Cont. Boys				31	22	16	10
Cont. Girls				19	15	7	5
Total				95	70	44	28

*See page 64 for an explanation of this table.

TABLE 4-6c

PBI Socio-Emotional State
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.				3.4	3.9	3.9	3.8
Total Cont.				3.5	3.4	3.4	3.4
F-Ratio (Group Main Effect)				<1	6.86	3.19	1.41
Significance				NS	.05	.10	NS
SEX MEANS:							
Total Boys				3.6	3.7	3.5	3.4
Total Girls				3.4	3.6	3.9	3.8
F-Ratio (Sex Main Effect)				<1	<1	2.86	1.49
Significance				NS	NS	.10	NS
GROUP x SEX CELL MEANS:							
Exp. Boys				3.6	3.9	3.6	3.6
Exp. Girls				3.3	4.0	4.3	4.0
Cont. Boys				3.6	3.5	3.3	3.2
Cont. Girls				3.5	3.3	3.6	3.6
F-Ratio (G x S Interaction)				<1	<1	<1	<1
Significance				NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys				25	17	13	8
Exp. Girls				20	16	8	5
Cont. Boys				31	22	16	10
Cont. Girls				19	15	7	5
Total				95	70	44	28

*See page 64 for an explanation of this table.

TABLE 4-6d

PBI Teacher Dependence
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.				3.3	3.5	3.6	3.6
Total Cont.				3.6	3.3	3.5	3.4
F-Ratio (Group Main Effect)				2.30	1.91	<1	<1
Significance				NS	NS	NS	NS
SEX MEANS:							
Total Boys				3.4	3.4	3.6	3.4
Total Girls				3.5	3.4	3.5	3.6
F-Ratio (Sex Main Effect)				<1	<1	<1	<1
Significance				NS	NS	NS	NS
GROUP x SEX CELL MEANS:							
Exp. Boys				3.4	3.6	3.5	3.4
Exp. Girls				3.3	3.4	3.6	3.7
Cont. Boys				3.5	3.2	3.6	3.3
Cont. Girls				3.7	3.4	3.4	3.5
F-Ratio (G x S Interaction)				<1	1.30	<1	<1
Significance				NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys				25	17	13	8
Exp. Girls				20	16	8	5
Cont. Boys				31	22	16	10
Cont. Girls				19	15	7	5
Total				95	70	44	28

*See page 64 for an explanation of this table.

TABLE 4-6e

P3I Personal Behavior
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.				4.0	4.3	4.3	4.2
Total Cont.				4.0	3.8	4.1	4.1
F-Ratio (Group Main Effect)				<1	8.85	<1	<1
Significance				NS	.01	NS	NS
SEX MEANS:							
Total Boys				4.0	4.0	4.0	3.7
Total Girls				4.0	4.1	4.3	4.5
F-Ratio (Sex Main Effect)				<1	<1	1.72	7.17
Significance				NS	NS	NS	.05
GROUP x SEX CELL MEANS:							
Exp. Boys				4.1	4.3	4.2	3.7
Exp. Girls				3.9	4.2	4.3	4.6
Cont. Boys				3.9	3.6	3.9	3.8
Cont. Girls				4.1	3.9	4.3	4.5
F-Ratio (G x S Interaction)				2.78	1.22	<1	<1
Significance				.10	NS	NS	NS
GROUP x SEX CELL SIZES (N):							
Exp. Boys				25	17	13	8
Exp. Girls				20	16	8	5
Cont. Boys				31	22	16	10
Cont. Girls				19	15	7	5
Total				95	70	44	28

*See page 64 for an explanation of this table.

TABLE 4-7a

YRS Academic Potential
Group-by-Sex Analysis of Variance Results*

	TIME OF DATA COLLECTION						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:							
Total Exp.				12.3	13.2	13.0	11.4
Total Cont.				11.1	11.1	9.8	10.6
F-Ratio (Group Main Effect)				1.99	2.59	4.23	.01
Significance				NS	NS	.05	NS
SEX MEANS:							
Total Boys				12.2	11.7	10.0	10.5
Total Girls				11.1	12.5	12.9	11.4
F-Ratio (Sex Main Effect)				1.61	.01	3.51	.01
Significance				NS	NS	.10	NS
GROUP x SEX CELL MEANS:							
Exp.	Boys			13.1	11.5	9.8	10.5
	Girls			11.4	14.8	16.3	12.2
Cont.	Boys			11.3	12.0	10.1	10.5
	Girls			10.8	10.2	9.5	10.6
F-Ratio (G x S Interaction)				.01	4.11	5.14	.01
Significance				NS	.05	.05	NS
GROUP x SEX CELL SIZES (N):							
Exp.	Boys			23	16	13	8
	Girls			20	15	8	5
Cont.	Boys			32	21	16	10
	Girls			19	15	7	5
	Total			94	67	44	28

*See page 64 for an explanation of this table.

TABLE 4-7b

YRS Mother Participation
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.					8.3	9.0	7.0	7.3
Total Cont.					7.6	7.8	8.1	7.3
F-Ratio (Group Main Effect)					<1	1.23	<1	<1
Significance					NS	NS	NS	NS
SEX MEANS:								
Total Boys					7.7	8.4	6.5	6.7
Total Girls					8.2	8.4	8.5	7.9
F-Ratio (Sex Main Effect)					<1	<1	1.84	<1
Significance					NS	NS	NS	NS
GROUP x SEX CELL MEANS:								
Exp.	Boys				8.5	8.7	6.6	7.6
	Girls				8.0	9.2	7.3	7.8
Cont.	Boys				6.8	8.0	6.5	5.8
	Girls				8.4	7.6	9.7	8.8
F-Ratio (G x S Interaction)					1.55	<1	<1	1.16
Significance					NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):								
Exp.	Boys				23	16	13	8
	Girls				20	15	8	5
Cont.	Boys				32	21	16	10
	Girls				19	15	7	5
	Total				94	67	44	28

*See page 64 for an explanation of this table.

TABLE 4-7c

YRS Social Development
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.					12.8	14.2	14.8	11.7
Total Cont.					12.8	12.1	10.9	11.3
F-Ratio (Group Main Effect)					<1	4.00	6.81	<1
Significance					NS	.05	.05	NS
SEX MEANS:								
Total Boys					13.3	13.5	12.3	11.1
Total Girls					12.2	12.8	13.4	11.9
F-Ratio (Sex Main Effect)					1.55	<1	<1	<1
Significance					NS	NS	NS	NS
GROUP x SEX CELL MEANS:								
Exp.	Boys				14.0	14.4	13.0	11.6
	Girls				11.6	14.1	16.6	11.8
Cont.	Boys				12.7	12.7	11.6	10.6
	Girls				12.8	11.6	10.2	12.0
F-Ratio (G x S Interaction)					2.06	<1	2.77	<1
Significance					NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):								
Exp.	Boys				23	16	13	8
	Girls				20	15	8	5
Cont.	Boys				32	21	16	10
	Girls				19	15	7	5
	Total				94	67	44	28

*See page 64 for an explanation of this table.

TABLE 4-7d

YRS Verbal Skill
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.					3.9	4.2	4.9	3.8
Total Cont.					3.8	3.8	3.1	3.8
F-Ratio (Group Main Effect)					<1	1.13	9.75	<1
Significance					NS	NS	.01	NS
SEX MEANS:								
Total Boys					4.1	4.3	3.9	4.1
Total Girls					3.6	3.7	4.1	3.5
F-Ratio (Sex Main Effect)					1.49	2.14	<1	<1
Significance					NS	NS	NS	NS
GROUP x SEX CELL MEANS:								
Exp.	Boys				4.2	4.2	4.3	3.9
	Girls				3.6	4.3	5.4	3.8
Cont.	Boys				3.9	4.4	3.5	4.4
	Girls				3.7	3.1	2.8	3.2
F-Ratio (G x S Interaction)					<1	2.29	2.25	<1
Significance					NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):								
Exp.	Boys				23	16	13	8
	Girls				20	15	8	5
Cont.	Boys				32	21	16	10
	Girls				19	15	7	5
	Total				94	67	44	28

*See page 64 for an explanation of this table.

TABLE 4-7e

YRS Emotional Adjustment
Group-by-Sex Analysis of Variance Results*

		TIME OF DATA COLLECTION						
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G
GROUP MEANS:								
Total Exp.					7.8	10.8	9.9	10.0
Total Cont.					8.3	8.4	7.5	7.4
F-Ratio (Group Main Effect)					<1	9.86	8.53	4.13
Significance					NS	.01	.01	.10
SEX MEANS:								
Total Boys					8.0	9.2	8.3	7.6
Total Girls					8.1	9.9	9.1	9.7
F-Ratio (Sex Main Effect)					<1	<1	<1	2.63
Significance					NS	NS	NS	NS
GROUP x SEX CELL MEANS:								
Exp.	Boys				7.9	10.5	9.0	8.1
	Girls				7.6	11.0	10.8	11.8
Cont.	Boys				8.1	7.9	7.6	7.1
	Girls				8.5	8.9	7.4	7.6
F-Ratio (G x S Interaction)					<1	<1	1.35	1.52
Significance					NS	NS	NS	NS
GROUP x SEX CELL SIZES (N):								
Exp.	Boys				23	16	13	8
	Girls				20	15	8	5
Cont.	Boys				32	21	16	10
	Girls				19	15	7	5
	Total				94	67	44	28

*See page 64 for an explanation of this table.

No sex differences appeared at the end of the first grade, but girls did significantly better than boys in both the second and third grades. The reason for this becomes clear when the group-by-sex cell means presented in Table 4-5 are examined, where there appears to be an important and consistent difference between the experimental girls and the other three groups. Sheffé post hoc comparisons between the experimental girls and the other three groups produced statistically significant differences in favor of the experimental girls in all three grades. Since the experimental boys look essentially like the control children, the significant experimental group superiority was clearly due to the good performance of the experimental girls. In view of the potential importance of this finding, additional means using later follow-up data were calculated by hand. These calculatio: revealed that the differences between the experimental girls and the other groups were not diminished, but rather exaggerated by the addition of the new data. To help give some perspective to the magnitudes of the raw scores it should be noted that the CAT mean for experimental girls was approximately at the 25th percentile of the CAT norms, while the other three group means did not exceed the 8th percentile.

Socio-Emotional Rating Scale Results

Pupil Behavior Inventory (PBI). Beyond kindergarten, the experimental group means were higher than the control group means at every test date on every factor (Tables 4-6a, 4-6b, 4-6c, 4-6d, and 4-6e). At the end of the first grade all of the differences, except Teacher Dependence, were significant, but only the Academic Motivation and Socio-Emotional State factors maintained significance to the end of the second grade (Tables 4-6b and 4-6c). These last two factors followed a stable trend into third grade, suggesting that when additional data becomes available the S3G F-ratios may also reach significance.

Comparing girls to boys, one overriding difference dwarfed all other differences--girls were rated significantly higher than boys on Classroom Conduct (Table 4-6a) in all grades. On a smaller scale, however, other differences also appeared. On the Academic Motivation, Socio-Emotional State, and Personal Behavior factors (Tables 4-6b, 4-6c, and 4-6e), the mean ratings for girls become increasingly larger than

the mean ratings for boys at successive grade levels. Examination of the group-by-sex means revealed that on the Academic Motivation and Socio-Emotional State factors the differences were primarily due to the experimental girls, closely paralleling the California Achievement Test results.

Ypsilanti Rating Scale (YRS). With only two minor exceptions, mean ratings of the experimental group equalled or exceeded the mean ratings of the control group at all test dates on every factor (Tables 4-7a, 4-7b, 4-7c, 4-7d, and 4-7e). The two exceptions were S2G Mother Participation and SKG Emotional Adjustment (Tables 4-7b and 4-7e).

Only some of the differences reached significance, however. Differences on the Academic Potential factor (Table 4-7a) only reached significance at the end of the second grade, primarily due to the high ratings of the experimental girls (see below). No significant differences at all appeared on the Mother Participation factor (Table 4-7b). Two significant differences appeared on the Social Development factor (Table 4-7c) at the end of the first and second grades, but the difference almost completely disappeared at the end of the third grade. Differences on the Verbal Skill factor (Table 4-7d) only reached significance at the end of the second grade, then disappeared completely at the end of the third grade. The Emotional Adjustment factor (Table 4-7e) revealed a trend of significant experimental superiority from the end of the first grade through the end of the third grade. Additional third grade data may extend the trends of experimental superiority which were exhibited in the first and second grades on some of the factors above; currently only Wave 0 data is reported at the third grade, rendering conclusions about the declining differences tentative.

Regarding differences between girls and boys, four of the factors revealed essentially no significant differences coupled with erratic trends: Mother Participation, Social Development, Verbal Skill, and Emotional Adjustment (Tables 4-7b, 4-7c, 4-7d, and 4-7e). On the remaining factor, Academic Potential (Table 4-7a), girls were consistently rated higher than boys at the end of the first grade and above. The difference reached significance at the end of the second grade, but similar to the experimental/control difference at the same date (above) the difference could be attributed

entirely to the experimental girls. Additional support for the higher ratings of the experimental girls comes from the significant interaction which occurred at the end of the first and second grades. These results closely parallel trends revealed on the PBI Academic Motivation and Socio-Emotional State factors, and also on the CAT Total raw scores, lending conclusiveness to the trend of experimental girl superiority in spite of the small sample at higher grade levels.

Regression Analysis Results

Regression analysis allows tentative answers to the basic question of which independent variables best predict certain dependent variables. The independent and dependent variables selected for consideration are presented in Table 4-8. The stepwise regression technique generates a hierarchical listing of the most important independent variables from those predicting the greatest to those predicting the least proportion of non-overlapping variance in the dependent variable. Thus, the listing of independent variables for a given dependent variable orders the former according to their predictive utility.

Dependent variables. The two most important dependent variables, the Stanford-Binet Intelligence Scale and the California Achievement Test, were used in the regression analysis. Stanford-Binet scores from both years of preschool, kindergarten, and first grade were included in the analysis, as were California Achievement Test scores from first, second, and third grades.

Independent variables. The eleven independent variables selected can be categorized into five groups: 1) the main independent variable of preschool attendance versus non-attendance (experimental vs. control treatment), 2) the four cognitive measures administered when the children entered the project (Stanford-Binet, Leiter, PPVT, and ITPA), 3) four of the home background variables (mother's education, cultural deprivation (C.D.) rating, the total of the factor scores on the Cognitive Home Environment Scale (CHES), and the class sensitive factor score on the Inventory of Attitudes on Family Life and Children (Inventory*), 4) sex, and

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* Inventory data collected in the spring of the entering year rather than in the fall of the entering year were chosen on the basis of correlation results. Also, it appeared that these "retest" data were truer measures of the mothers attitudes, that mothers were more frank with the interviewers in the spring than during the initial contacts in the fall, and thus the results would be less biased by various response sets.

5) the total number of birth complications. These independent variables were chosen on the basis of either their a priori theoretical importance or their apparent relationship to the dependent variable as suggested by preliminary correlation results.

Logically, it appeared that the four fall entering year cognitive variables and the four home background variables might actually function as two blocks of variables rather than as eight separate variables. Inspection of the intercorrelations of the four FEY cognitive measures showed a weak to moderate relationship (average correlation coefficient of .30 with a range of .13 to .42) for both the experimental and the control subsamples. However, two of the four home background variables, mother's education and the family's cultural deprivation rating, are strongly related (correlation coefficients of about .70) for both subsamples; mother's education and the CHES are strongly related for the experimental sample. The rest of the relationships among the home background variables are weak to moderate (correlation coefficients average .20 with a range of -.06 to .36). Thus, the FEY cognitive variables function fairly independently and may be viewed as separate variables. However, of the home background variables, mother's education and C.D. rating are so highly related that the selection of either one into the regression analysis would probably suppress consideration of the other. This is also true for mother's education and the CHES for the experimental sample.

Regression analysis sample. Because all subjects missing data on any dependent or independent variable had to be dropped from the regression analysis, every effort was made to have the data as complete as possible. Whereas all subjects had data for most variables, many were missing the CHES and the Inventory. Subjects missing these data, whose siblings in the sample had them, were arbitrarily assigned the same scores as their siblings. This decision appeared justified since the subjects' mothers provided CHES and Inventory data, both of which are concerned more with general attitudes and practices of the mother and family than with the behavior of a specific child.

For the independent variables, 80 subjects had complete data (38 experimental and 42 control subjects). Thus, 43 children were missing data on independent variables and were necessarily dropped from the regression analysis sample. The children omitted came from the experimental and control samples in about equal

Table 4-8

Dependent and Independent Variables Used in Regression Analysis of Perry Preschool Data

Dependent variables	Regression analysis sample sizes: Exp. & Cont. sample	Exper. sample	Control sample
Stanford-Binet			
Spring entering year	80	38	42
Spring second year	60	28	32
Spring kindergarten	68	32	36
Spring first grade	48	23	25
California Achievement Test (total raw score)			
Spring first grade	48	23	25
Spring second grade	61	29	32
Spring third grade	43	22	21

Independent variables	Variable code
Experimental vs. control group	E/C
Fall entering year cognitive variables	
Stanford-Binet	FEY S-B
Leiter	FEY Leiter
PPVT	FEY PPVT
ITPA	FEY ITPA
Home background variables	
Mother's education	Mo-Educ
Cultural deprivation rating	C-D Rating
Cognitive Home Environment Scale (total of factor scores)	CHES
Inventory of Attitudes on Family Life & Children (SEY score on class sensitive factor)	Inventory
Sex	Sex
Birth complications (total number)	Birth

proportions (20 of 58 experimental children and 23 of 65 control children). The 80 children having complete data for all independent variables comprise the "regression analysis subsample," which numbers 80 at most and fluctuates according to how many subjects were missing data on a given dependent variable. (The final sizes of the regression analysis subsamples are listed for each dependent variable in Table 4-8.)

As a cursory check on the representativeness of the subsample, correlations between the independent and the dependent variables for the subsample were compared visually with the same correlations for the total sample (the experimental subsample vs. total experimental sample, and the control subsample vs. total control sample). The correlations appeared fairly similar for both the experimental and control samples' comparisons. A rank ordering of all correlations between independent variables and a given dependent variable from the strongest to the weakest correlation showed that the strongest relationships for the subsamples also were generally the strongest for the total samples. In addition, the magnitude of differences in correlation values between the samples were compared; none was significant at the .05 level. Thus, after comparing the pairwise correlation matrices,* it appears that the regression analysis subsample is representative enough of the total Perry sample so that the results are applicable to both.

For the dependent variables, all subjects had Stanford-Binet scores for the end of the first year of preschool. Thus, the entire regression analysis subsample was used in this part of the analysis. All subjects except Wave 0 had Stanford-Binet scores for their second year of preschool, thereby reducing the size of the subsample for this part of the regression analysis by the number of Wave 0 children. For the remaining dependent variables, the subsample available depended on how many waves had completed a specific grade by the spring of 1967, the end of the preschool's operation. Even though the annual collection of cognitive, achievement, and social data has continued, most analyses in this report use data collected only during the preschool's actual operation (fall, 1962, through spring, 1967). However, additional data collected after the spring of 1967 were included in the regression analysis of second and third grade achievement data in order to increase the sample size to the point where such an analysis was feasible. Because the regression analysis subsamples

* The "pairwise correlation" matrices were compared even though it is the "partial correlations" that enter the regression analysis and the two could be very dissimilar. Because of the missing data no "partial correlation" values were available for the total sample and the comparison of pairwise correlation matrices must suffice.

used for elementary school measurements of the dependent variables are comprised only of children from the earlier waves, these results must be viewed as merely suggestive of results to be obtained when the later waves progress through the early elementary grades and their data become available.

Presentation of regression analysis results. Results will be presented in two ways. First, the dependent variables will be presented with their best predictors from among the independent variables. Second, each independent variable will be presented separately to explore its relative predictive utility. In each case, results are given for three groupings of the regression analysis subsample: experimental and control children combined, experimental children alone, and control children alone. The first grouping was used to explore the importance of the major independent variable: preschool attendance vs. non-attendance. The last two groupings were used to assess the importance of the remaining independent variables.

Prediction of the Stanford-Binet Intelligence Scale (S-B) and the California Achievement Test (CAT)

The best predictors of the Stanford-Binet and the California Achievement Test are presented in Tables 4-9 and 4-10. Only those independent variables which account for 4% or more of the variance in the dependent variables are listed. For each of these "key predictors" the following information is given:

1. r, the Pearson correlation coefficient between the independent and dependent variables. Note that r is not the multiple correlation coefficient, or R.
2. R^2, the total (cumulative) amount of variance in the dependent variable explained by the independent variable(s).
3. Inc. R^2, the increase in the total amount of explained variance attributable to a given independent variable.

4. F, the F value indicating whether or not the increase in the amount of variance explained in the dependent variable by the addition of this independent variable is statistically significant.

Because each combination of subsample grouping and testing date required a separate analysis, there are twelve listings of key predictors for the Stanford-Binet in Table 4-9 (three subsample groupings for each of four Stanford-Binet testing dates). Likewise, for the California Achievement Test there are nine lists of key predictors (three subsample groupings for each of the three grades).

The amounts of variance explained by the key predictors are depicted graphically in Figures 4-1 and 4-2. For the Stanford-Binet, the key predictors account for about 40% to 70% of the variance except in two cases where they account for slightly over 30%. For the California Achievement Test, the key predictors explain even more variance: about 50% to 70% except in two cases where they account for slightly over 40%.

Prediction of the Stanford-Binet. Knowledge about whether a child was in the experimental or control group was the best single predictor of the S-B for both preschool years, predicting about 20% of the variance in spring entering year and in spring second year scores. By elementary school preschool attendance vs. nonattendance was no longer a key predictor (Table 4-9, experimental and control samples combined). Fall entering year Stanford-Binet scores predicted later S-B scores better than did any other independent variable. It was the only independent variable to appear as a key predictor for both the experimental and control subsamples for every S-B testing date. It also explained more variance than any other single independent variable, except when predicting spring second year Stanford-Binet (for both subsamples) and spring kindergarten Stanford-Binet (control subsample). The FEY S-B was a very powerful predictor of later S-B scores for the experimental subsample, explaining almost half the variance at the end of kindergarten and of first grade. For the control subsample it was not as outstanding, predicting only 6% to 21% of the variance at the different testing dates.

Spring second year Stanford-Binet scores were best predicted by the Inventory for the experimental subsample and by the CHES for the control subsample. The failure of

FEY S-B to be the best predictor of S2Y S-B appeared to be a chance event for the experimental subsample. As seen in Table 4-9a, correlations of FEY S-B and all later S-B scores were high (ranging from about .55 to .70 for both the experimental subsample and total sample) except for S2Y when the correlation coefficient was only .30 for the subsample and .35 for the total sample. Likewise, correlations of the Inventory and S-B were low (ranging from .03 to -.23 for both the experimental subsample and total sample) except for S2Y when the correlation coefficient was suddenly strong (-.49 for the total sample and -.46 for the subsample). Thus, the correlation between FEY S-B and S2Y S-B appeared spuriously low while the correlation between the Inventory and S2Y S-B appeared spuriously high. The concurrent occurrence of these two events allowed the Inventory to replace the FEY S-B as best predictor of the Stanford-Binet for S2Y.

As was already stated, FEY S-B was not as powerful a predictor of later Stanford-Binet scores for the control sample as for the experimental sample. At only one of the four testing dates did it account for over 11% of the S-B variance (21% of SEY S-B). Thus, even though it was the first independent variable selected to predict the S-B at two testing dates, its replacement by the CHES and PPVT at the remaining testing dates was not inconsistent.

Table 4-9a

Correlations Between FEY S-B, the Inventory, and Later S-B Scores for the Entire Experimental Sample and for the Regression Analysis Experimental Sample

	Stanford-Binet Scores						
	FEY	SEY	S2Y	SKG	S1G	S2G	S3G
FEY Stanford-Binet							
Entire Exp. sample		.55	.35	.61	.68	.63	.60
Exp. subsample		.53	.30	.67	.67	--	--
Inventory							
Entire Exp. sample	-.01	-.05	-.49	-.02	-.15	-.07	-.19
Exp. subsample	.03	.03	-.46	-.23	-.16	--	--

Table 4-9

Selected Stanford-Binet Regression Analysis Results[1]

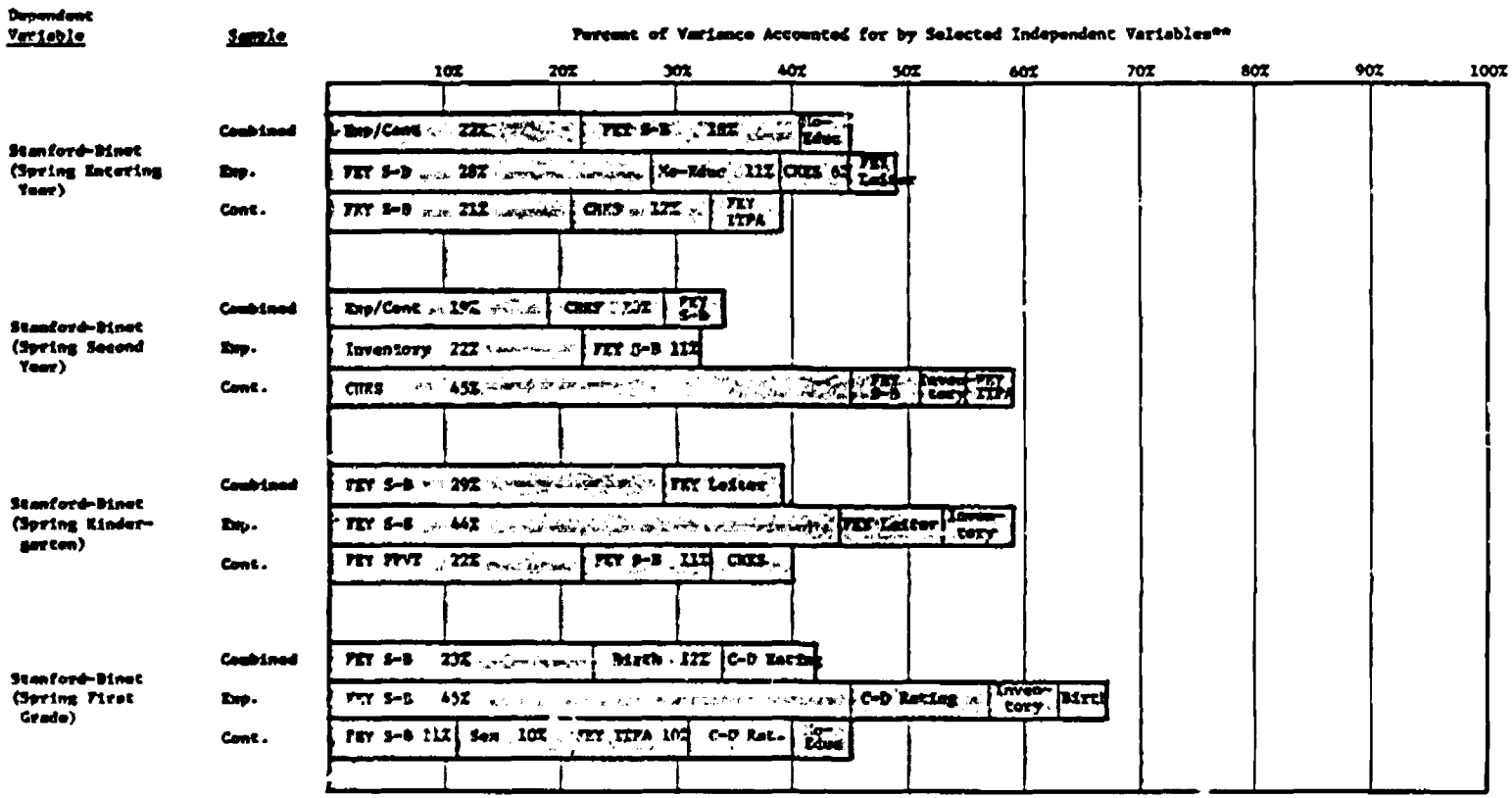
		Experimental & Control Samples Combined					Experimental Sample					Control Sample				
Dependent Variable	Sample Size	Indep. Var.	r	R^2	Inc. R^2	F	Sample Size	Indep. Var.	r	R^2	Inc. R^2	F	Sample Size	Indep. Var.	r	R^2	Inc. R^2	F
SET Stanford-Binet	80	E/C	.47	.22	.22	22.2256*	38	PET S-B	.53	.28	.28	14.1310*	42	PET S-B	.46	.21	.21	10.5430*
		PET S-B	.43	.41	.18	24.3257*		Mo-Educ	.50	.39	.11	6.5038*		CMES	.37	.33	.12	7.3386*
		Mo-Educ	.27	.45	.04	5.1099*		CMES	.19	.45	.06	3.4211		PET ITPA	.26	.39	.05	3.2815
								PET Leiter	.30	.49	.04	2.9177						
SIY Stanford-Binet	60	E/C	.44	.19	.19	13.5282*	28	Inventory	-.46	.22	.22	7.1440*	32	CMES	.67	.45	.45	24.5487*
		CMES	.30	.29	.10	7.9876*		PET S-B	.30	.32	.11	3.9646		PET S-B	.34	.51	.06	3.3868
		PET S-B	.29	.34	.05	4.1448*								Inventory	.30	.55	.04	2.6699
														PET ITPA	.02	.59	.04	2.9029
SMG Stanford-Binet	68	PET S-B	.54	.29	.29	26.7247*	32	PET S-B	.67	.44	.44	23.9607*	36	PET PPVT	.47	.22	.22	9.7340*
		PET Leiter	.45	.39	.10	10.4433*		PET Leiter	.48	.53	.09	5.3948*		PET S-B	.45	.33	.11	5.4502*
								Inventory	-.23	.59	.06	3.8109		CMES	.36	.40	.07	3.6065
SIG Stanford-Binet	48	PET S-B	.48	.23	.23	13.4674*	23	PET S-B	.67	.45	.45	16.9799*	25	PET S-B	.33	.11	.11	2.8546
		Birth	-.25	.34	.12	7.9458*		C-D Rating	.64	.57	.12	5.7662*		Sex	-.13	.21	.10	2.7172
		C-D Rating	.45	.42	.08	6.0935*		Inventory	-.16	.63	.06	2.8977		PET ITPA	.24	.31	.10	3.0452
								Birth	-.41	.47	.04	2.3091		C-D Rating	.24	.40	.09	2.9135
														Mo-Educ	.05	.45	.06	1.9030

[1]See page 87 for explanation of table.

*Significant at the .05 level.

Figure 4-1

Selected Stanford-Binet Regression Analysis Results[1]



[1]See page 88 for explanation of figure.

Table 4-10

Selected California Achievement Test Regression Analysis Results[1]

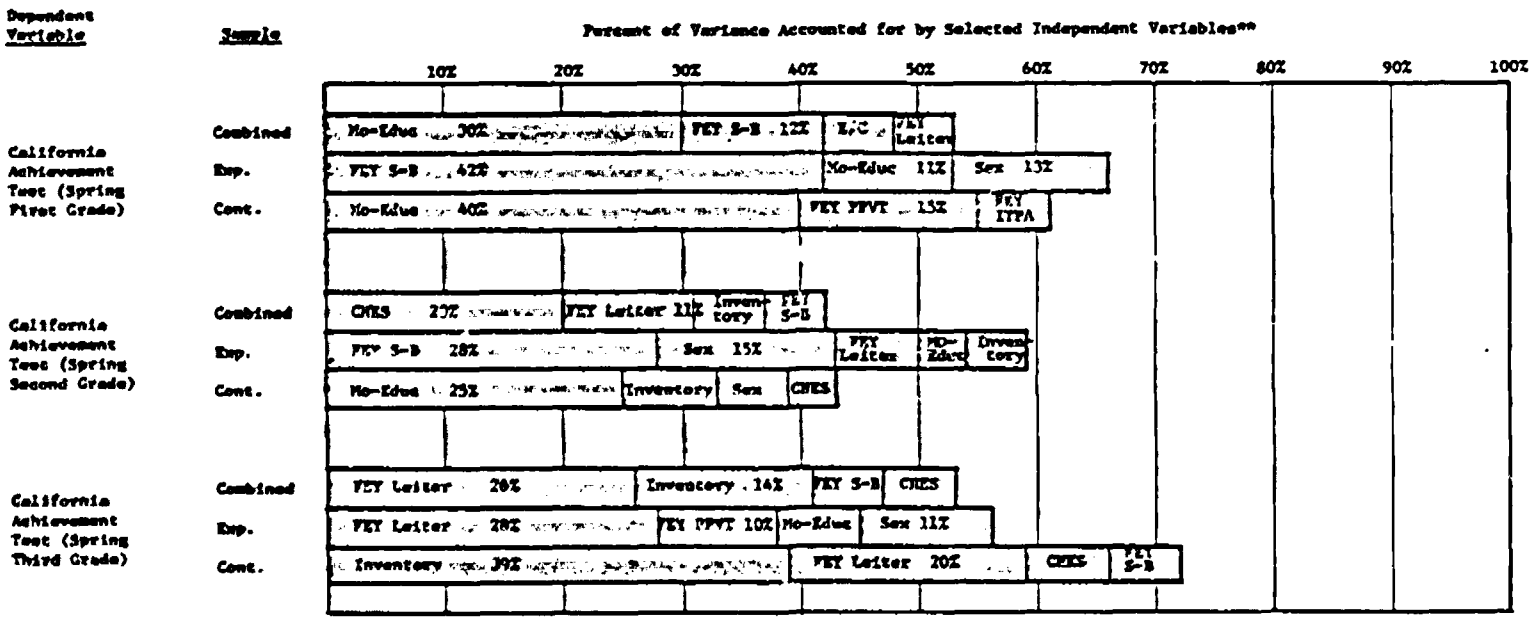
	Experimental & Control Samples Combined						Experimental Sample						Control Sample					
Dependent Variable	Sample Size	Indep. Var.	r	R^2	Inc. R^2	F	Sample Size	Indep. Var.	r	R^2	Inc. R^2	F	Sample Size	Indep. Var.	r	R^2	Inc. R^2	F
SIG California Achievement Test	48	Mo-Educ	.55	.30	.30	19.5730*	23	PEY S-B	.64	.42	.42	14.9976*	25	Mo-Educ	.63	.40	.40	15.1098*
		PEY S-B	.63	.42	.12	9.2360*		Mo-Educ	.52	.53	.11	4.7549*		PEY PPVT	.51	.55	.15	7.3949*
		E/C	.32	.48	.06	5.3338*		Sex	.35	.66	.13	7.2387*		PEY ITPA	.21	.61	.06	3.4812
		PEY Leiter	.43	.53	.05	4.8092*												
S2G California Achievement Test	61	CNES	.45	.20	.20	14.7247*	29	PEY S-B	.53	.28	.28	10.4862*	32	Mo-Educ	.50	.25	.25	9.8421*
		PEY Leiter	.44	.31	.11	8.9298*		Sex	.39	.43	.15	6.8477*		Inventory	.47	.33	.08	3.5789
		Inventory	.33	.37	.06	5.3991*		PEY Leiter	.48	.50	.07	3.2852		Sex	.18	.39	.06	2.6756
		PEY S-B	.35	.42	.05	4.6869*		Mo-Educ	.35	.54	.05	2.4368		CNES	.32	.43	.04	2.1304
								Inventory	-.02	.59	.04	2.5339						
S3G California Achievement Test	43	PEY Leiter	.51	.26	.26	14.7749*	22	PEY Leiter	.53	.28	.28	7.7496*	21	Inventory	.62	.39	.39	11.9714*
		Inventory	.40	.41	.14	9.7888*		PEY PPVT	.47	.38	.10	3.1630		PEY Leiter	.49	.59	.20	8.7733*
		PEY S-B	.44	.47	.06	4.8148*		Mo-Educ	.42	.45	.07	2.2770		CNES	.33	.66	.08	3.8190
		CNES	.43	.53	.06	4.5185*		Sex	.39	.56	.11	4.4059		PEY S-B	.36	.72	.06	3.4826

[1]See page 87 for explanation of table.

*Significant at the .05 level.

Figure 4-2

Selected California Achievement Test Regression Analysis Results[1]



[1]See page 88 for explanation of figure.

Table 4-11

Predictive Ability of the Independent Variables Used in the Stamford-Binet Regression Analysis[1]

Independent Variables		Experimental & Control Sample				Stamford-Binet Experimental Sample				Control Sample			
		SEY N=80	S2Y N=60	SXC N=68	S1C N=48	SEY N=38	S2Y N=28	SXC N=32	S1C N=23	SEY N=42	S2Y N=32	SXC N=36	S1C N=25
Experimental vs. Control Group	Step	1	1	4	4								
	r with DV	.47	.44	.24	.33								
	inc in R^2	.22*	.19*	.02	.03								
Fall Entering Year Cognitive Variables													
FLY Stamford-Binet	Step	2	3	1	1	1	2	1	1	1	2	2	1
	r with DV	.45	.29	.54	.48	.53	.50	.67	.67	.46	.34	.45	.33
	inc in R^2	.18*	.05*	.29*	.23*	.28*	.11	.44*	.45*	.21*	.06	.11*	.11
FEY Leiter	Step	7	5	2	10	4	4	2	9	8	—	6	10
	r with DV	.34	.28	.45	.28	.30	.19	.49	.42	.30	.30	.37	.31
	inc in R^2	.00	.01	.10*	.00	.04	.02	.09*	.00	.00	—	.01	.00
FEY PPVT	Step	8	—	—	9	9	6	5	—	—	6	1	9
	r with DV	.38	.32	.38	.31	.28	.15	.25	.26	.32	.38	.47	.10
	inc in R^2	.00	—	—	.01	.01	.01	.02	—	—	.02	.22*	.00
FEY ITPA	Step	5	10	9	5	10	8	9	7	3	4	10	3
	r with DV	.20	.10	.14	.28	.12	.17	.18	.33	.26	-.02	.07	.24
	inc in R^2	.01	.00	.00	.03	.00	.00	.00	.00	.05	.04	.00	.10

Table 4-11 cont.

Home Background Variables													
Mother Education	Step	3	7	7	6	2	3	7	[illegible]	7	7	7	5
	r with DV	.27	.05	.24	.24	.45	.09	.29	.39	.11	.08	.17	.05
	inc in R^2	.04*	.00	.00	.02	.11*	.03	.01	.00	.00	.02	.00	.06
Cultural Deprivation Rating	Step	11	8	6	3	8	7	4	2	—	—	8	4
	r with DV	.31	.20	.34	.45	.40	.10	.38	.64	.13	.24	.26	.24
	inc in R^2	.00	.01	.01	.08*	.01	.00	.03	.12*	—	—	.00	.09
CMES	Step	6	2	3	7	3	10	6	6	2	1	3	6
	r with DV	.27	.30	.35	.32	.19	.09	.31	.39	.37	.67	.36	.23
	inc in R^2	.01	.10*	.03	.01	.06	.00	.00	.02	.12*	.45*	.07	.02
Inventory	Step	9	4	8	10	5	1	3	3	4	3	4	7
	r with DV	.23	.05	.17	.12	.03	-.46	-.23	-.16	.18	.30	.28	.17
	inc in R^2	.00	.02	.00	.00	.02	.22*	.06	.06	.02	.04	.04	.03
Sex	Step	10	6	—	8	6	7	—	5	6	8	5	2
	r with DV	.10	-.05	.16	.08	.03	-.18	-.02	.14	.10	.02	.27	-.13
	inc in R^2	.00	.00	—	.01	.02	.00	—	.02	.00	.01	.03	.10
Birth Complications	Step	4	9	5	2	7	5	8	4	5	5	9	8
	r with DV	-.13	-.02	-.17	-.25	-.09	.18	-.32	-.41	-.11	-.18	.00	-.06
	inc in R^2	.02	.00	.01	.12*	.01	.01	.00	.04	.01	.02	.00	.02

[1]See page 100 for explanation of table.

*Significant at the .05 level

Table 4-12

Predictive Ability of the Independent Variables Used in the California Achievement Test Regression Analysis[1]

Independent Variables		California Achievement Test: Experimental & Control Sample S1C N=48	S2C N=61	S3C N=43	Experimental Sample S1C N=23	S2C N=29	S3C N=22	Control Sample S1C N=25	S2C N=32	S3C N=21
Experimental vs. Control Group	Step	3	8	11						
	r with DV	.33	.30	.28						
	inc in R^2	.06*	.00	.00						
Fall Entering Year Cognitive Variables										
PEY Stanford-Binet	Step	2	4	3	1	1	5	9	6	4
	r with DV	.49	.35	.44	.65	.53	.50	.25	.21	.36
	inc in R^2	.12*	.05*	.06*	.42*	.28*	.03	.02	.02	.06
PEY Leiter	Step	4	2	1	7	3	1	10	9	2
	r with DV	.49	.44	.51	.47	.48	.53	.36	.30	.49
	inc in R^2	.05*	.11*	.26*	.00	.07	.28*	.00	.01	.20*
PEY PPVT	Step	11	11	5	10	9	2	2	7	5
	r with DV	.46	.36	.51	.33	.30	.47	.51	.30	.47
	inc in R^2	.00	.00	.02	.00	.00	.10	.15*	.01	.01
PEY ITPA	Step	7	6	8	9	8	8	3	5	9
	r with DV	.20	.20	.08	.20	.15	.12	.21	.24	.06
	inc in R^2	.01	.01	.01	.00	.02	.01	.04	.04	.00

Table 4-12 cont.

Home Background Variables											
Mother Education	Step	1	7	7	2	4	3	1	1	7	
	r with DV	.35	.44	.48	.52	.35	.42	.63	.50	.59	
	inc in R^2	.30*	.01	.03	.11*	.05	.07	.40*	.25*	.00	
Cultural Deprivation	Step	9	9	10	5	7	9	4	8	8	
	r with DV	.53	.35	.47	.57	.35	.44	.49	.30	.49	
	inc in R^2	.00	.00	.00	.01	.02	.01	.03	.00	.01	
CMES	Step	6	1	4	8	10	7	8	4	3	
	r with DV	.47	.45	.43	.47	.50	.46	.37	.32	.33	
	inc in R^2	.01	.20*	.06*	.00	.00	.02	.02	.04	.08	
Inventory	Step	5	3	2	6	5	6	7	2	1	
	r with DV	.40	.33	.41	.22	-.02	.07	.49	.47	.62	
	inc in R^2	.02	.06*	.14*	.00	.04*	.02	.01	.08	.39*	
Sex	Step	8	5	6	3	2	4	5	3	10	
	r with DV	.25	.32	.35	.35	.39	.39	-.01	.18	.17	
	inc in R^2	.00	.03	.02	.13*	.15*	.11	.03	.06	.00	
Birth Complications	Step	10	10	9	4	6	10	6	10	6	
	r with DV	-.18	-.12	-.20	-.42	-.26	-.35	.13	.05	-.03	
	inc in R^2	.00	.00	.00	.02	.02	.00	.02	.00	.00	

[1]See page 100 for explanation of table.

*Significant at the .05 level.

TABLE 4-11a

Rank Ordering Of Independent Variables
By Their Overall Predictive Importance

Stanford-Binet Prediction				California Achievement Test Prediction			
Experimental Subsample		Control Subsample		Experimental Subsample		Control Subsample	
Independent Variable	Avg. Increase in Variance*	Independent Variable	Avg. Increase in Variance*	Independent Variable	Avg. Increase in Variance*	Independent Variable	Avg. Increase in Variance*
FEY S-B	.32	CHES	.17	FEY S-B	.24	Mo-Educ	.22
Inventory	.09	FEY S-B	.12	Sex	.13	Inventory	.16
FEY Leiter	.04	FEY PPVT	.06	FEY Leiter	.12	FEY Leiter	.07
Mo-Educ	.04	FEY ITPA	.05	Mo-Educ	.08	FEY PPVT	.06
C-D Rating	.04	Sex	.04	PPVT	.03	CHES	.05
CHES	.02	Inventory	.03	Inventory	.02	FEY S-B	.03
Birth	.02	Mo-Educ	.02	FEY ITPA	.01	FEY ITPA	.03
FEY PPVT	.01	C-D Rating	.02	C-D Rating	.01	Sex	.03
Sex	.01	Birth	.01	CHES	.01	C-D Rating	.01
FEY ITPA	.00	FEY Leiter	.00	Birth	.01	Birth	.01

* The increase in the amount of variance explained in the dependent variable by the addition of a particular independent variable (Inc. in R^2 presented in Tables 4-11 and 4-12) was averaged across the four S-B testing dates and the three CAT testing dates for each independent variable.

Other key predictors of the Stanford-Binet show little consistency and explain only small proportions of the total variance. Of the fall entering year cognitive measures, the Leiter appeared twice as a key variable for the experimental subsample but explained little variance (4% and 9%). The ITPA and PPVT both helped predict the Stanford-Binet for the control subsample: the ITPA appeared three times but explained little variance (4% to 10%); the PPVT appeared only once, but then as the best predictor accounting for 22% of the variance in spring kindergarten Stanford-Binet scores. Of the home background variables the Inventory appeared three times for the experimental subsample and the CHES appeared three times for the control subsample. Except for S2Y S-B they explained little variance (6% to 12%). The remaining home background variables each appeared only once over the four testing dates for each subsample but showed no pattern except that C.D. Rating accounts for a small amount of variance in the S1G Stanford-Binet for both subsamples. Sex appeared only once (for the control subsample) as did birth complications (for the experimental subsample).

Prediction of the California Achievement Test. Preschool attendance (vs. non attendance) did not predict CAT scores. Instead, for the experimental subsample FEY S-B was the best CAT predictor for the first grade (explaining 42% of the variance) and for the second grade (explaining 28% of the variance) while FEY Leiter became the best predictor of the third grade CAT (explaining 28% of the variance). For the control subsample home background variables were the best CAT predictors. Mother's education explained 40% of the variance in S1G CAT; Mother's education, the Inventory and the CHES explained almost 40% of the variance in S2G CAT; the Inventory and the CHES explained over 40% of the variance in S3G CAT.

Other key variables also helped predict the CAT. For the experimental subsample, mothers' education and sex explained an additional 20% or so of the variance in CAT scores at each grade level. For the control subsample, each fall entering year cognitive measure appeared only once over the three grades, explaining little variance except for the FEY Leiter which predicted 20% of the variance in the S3G CAT.

Predictive importance of the independent variables

The results presented so far have focused on the dependent variables in order to answer the question, "how can one best predict children's later cognitive and achievement performances as measured by the Stanford-Binet and the Cali-

fornia Achievement Test?" Rather than consider all independent variables as predictors, only those which explained 4% or more of the variance in the S-B and the CAT were presented (Tables 4-9 and 4-10). Now the emphasis switches to the independent variables. Each independent variable is listed as a predictor of the Stanford-Binet (Table 4-11) and as a predictor of the California Achievement Test (Table 4-12). For each independent variable the following information is presented:

1. Step, the step number in the regression analysis in which the independent variable was chosen as "the best additional predictor" of the dependent variable;

2. r with DV, the Pearson correlation coefficient between the independent and dependent variable, (note that r is not the multiple correlation coefficient, or R.);

3. inc in R^2, the increase in the amount of variance explained in the dependent variable by the addition of the independent variable.

The increase in the amount of variance explained in the dependent variable by the addition of a particular independent variable (i.e., the inc in R^2 presented in Tables 4-11 and 4-12) was averaged for the four S-B testing dates and for the three CAT testing dates for each independent variable. The main independent variable, experimental vs. control group membership, explained an average increase in variance of 12% for the S-B and only 2% for the CAT. The remaining ten independent variables were rank ordered from those predicting the most to those predicting the least average increase in explained variance. The experimental and control subsamples were considered separately.

This rank ordering of the independent variables (Table 4-11a) highlights the overall predictive power of FEY S-B for the experimental subsample. On the other hand, for the control subsample the home background variables are the best predictors. This trend of home background variables being the best predictors for the control subsample and non-home background variables the best predictors for the experimental subsample is especially evident for the CAT. For the control subsample two home background variables are the best CAT predictors: Mo-Educ and Inventory explain an average of 38% of CAT variance. For the experimental subsample, three non-home background variables are the best CAT predictors: FEY S-B, sex, and FEY Leiter explain an average

of 49% of CAT variance. Few of the other variables account for much average increase in explained variance. Nor are there outstanding patterns displayed other than that the total number of birth complications has no predictive importance when considered with the set of independent variables used in the regression analysis.

As already mentioned, certain home background variables are highly related and selection of any one of them could suppress consideration of the others in the regression analysis. Thus, it is not surprising that these variables (Mo-Educ and C.D. Rating for the control subsample; Mo-Educ, C.D. Rating and CHES for the experimental subsample) appear to function as a group in predicting the CAT. For the experimental subsample the three home background variables correlated roughly the same with the CAT. Yet, only mother's education was listed as a "key predictor" in Table 4-10. Thus, mother's education appears to have suppressed the potential predictive importance of the C.D. Rating and the CHES. The same thing occurred for the control subsample: mother's education appears to have suppressed consideration of the C.D. Rating as an important CAT predictor. In predicting the Stanford-Binet, these clusters of home background variables did not correlate as highly with the S-B and the selection of one did not suppress consideration of the others. Thus, both Mo-Educ and the CHES appeared as key S-B predictors for the experimental subsample and both Mo-Educ and C.D. Rating appeared as key S-B predictors for the control subsample.

Because FEY S-B was such a powerful predictor of the Stanford-Binet for both subsamples and of the CAT for the experimental subsample, a regression analysis was done to predict FEY S-B. However, none of the independent variables selected (the four home background variables, sex, and number of birth complications) were able to predict FEY S-B. The best FEY S-B predictor was the C.D. Rating but it explained only 8% of the variance for the experimental subsample and 5% for the control subsample.

Correlation Results

This section of the chapter presents the Pearson product-moment correlation coefficients between most of the dependent and independent variables used in this study. Information about the most critical questions regarding the effects of preschool has already been extracted from the following correlation matrices using the regression analysis presented above. However, many less important though equally interesting questions have not yet been investigated. The size of the Perry Project sample is small in the later, more crucial,

grade levels, leaving conclusions based on those data tentative; because of this, analyses beyond the most important issues are being postponed until data collection is complete. Essentially, then, this section presents selected correlations without interpretation.

Correlation sample. Data for the entire experimental sample and the entire control sample were used to calculate the correlations presented in this section, in contrast to the reduced regression samples used above because of missing data. Because the samples were slightly different, there were discrepancies between correlation coefficients calculated for identical pairs of variables in the last section and this section; differences between the two sets of correlations were discussed in the Regression Analysis Results, where it was noted that the differences were generally small, and even the largest differences did not reach significance.

Missing data for the correlations presented here were accommodated on a cell by cell basis, where the number of subjects used to calculate adjacent coefficients might be quite different. Systematic cell differences across time occurred on all matrices because the youngest children had not yet reached the higher grades at the time of analysis. Thus the number of experimental children available varied from 58 at FEY to 13 at S3G; control children varied from 65 at FEY to 15 at S3G. To estimate a particular cell size, look up the variables in question in the analysis of variance tables presented earlier in the chapter and use the smaller of the two group sizes. Dashes in the correlation tables indicate that no data was available for that particular combination of variables; usually dashes were attributable to Wave 0 which only participated in one year of preschool.

Independent and dependent variables. The correlation tables primarily consist of two groups, the correlations of cognitive variables with all others, and the correlations of the California Achievement Tests with all others. Two additional tables present the intercorrelation of home background variables. The contents and numbers of correlation tables are presented on the next page.

Variables	Table number Experimental	Control
Cognitive variables by:		
Cognitive	4-13	4-14
Calif. Ach. Test	4-15	4-16
YRS Ratings	4-17	4-18
Preschool YRS Ratings	4-19	
Preschool PBI Ratings	4-20	
PBI Ratings	4-21	4-22
Home Background	4-23	4-24
Home Visit	4-37	
California Achievement Tests by		
Calif. Ach. Tests	4-25	4-26
YRS Ratings	4-27	4-28
Preschool YRS Ratings	4-29	
Preschool PBI Ratings	4-30	
PBI Ratings	4-31	4-32
Home Background	4-33	4-34
Home Background by Home Background	4-35	4-36

General observations about the correlations. In order to explore the tables, the correlation matrices were divided into "blocks." Each block was the correlation of two variables across all points in time, and the division into blocks largely corresponds to the divisions formed by lines in the tables. Blocks of correlations were then categorized by magnitude according to the following system:

High = correlations above .50
Moderate = correlations between .30 and .50
Low = correlations below .30

Blocks consisting mostly of high correlations as determined by systematic visual inspection were arbitrarily categorized high, and similarly for the moderate and low blocks. Using this system of categorizations, several generalizations can be made about the tables.

First of all, across all tables most correlations were in the low to moderate range of absolute magnitude. In view of the initial homogeniety of the Perry Project sample created by the screening criteria, and in view of the further homogeneity introduced by separating the group

Table 4-13

Intercorrelation of Cognitive Variables

Experimental Group

		S-B							Leiter							PPVT							ITPA					
		FEY	SEY	S2Y	SKG	S1G	S2G	S3G	FEY	SEY	S2Y	SKG	S1G	S2G	S3G	FEY	SEY	S2Y	SKG	S1G	S2G	S3G	FEY	S2Y	SKG	S1G	S2G	S3G
S-B	FEY																											
	SEY	55*																										
	S2Y	35*	64*																									
	SKG	61*	70*	63*																								
	S1G	68*	76*	76*	86*																							
	S2G	63*	76*	59	84*	77*																						
	S3G	60*	69*	--	79*	80*	91*																					
Leiter	FEY	28*	36*	39*	33*	35*	32	67*																				
	SEY	30	54*	38*	42*	46	--	--	45*																			
	S2Y	13	34*	49*	50*	66*	83*	--	42*	50*																		
	SKG	45*	51*	28	34*	38*	31	74*	51*	56*	35*																	
	S1G	51*	63*	44	53*	64*	58*	87*	25	78*	57*	58*																
	S2G	26	28	-08	39	43*	53*	59*	35	--	38	35	37															
	S3G	00	23	--	46	45	53	24	12	--	--	06	06	31														
PPVT	FEY	45*	27*	14	29	30	21	14	20	31	20	24	27	13	-40													
	SEY	07	38*	48*	22	33	--	--	21	44*	31	23	21	--	--	23												
	S2Y	44*	62*	56*	73*	62*	81*	--	32*	44*	34*	09	20	14	--	40*	47*											
	SKG	50*	54*	49*	71*	66*	54*	48	07	36	41*	16	44*	27	-10	32*	11	62*										
	S1G	62*	50*	42	55*	65*	55*	26	-02	25	39	-03	27	15	18	44*	29	60*	67*									
	S2G	53*	49*	79*	50*	67*	44*	22	-13	--	39	-20	35	00	32	36	--	52	67*	87*								
	S3G	44	21	--	24	32	39	59*	18	--	--	35	49	46	-13	33	--	--	66*	45	41							
ITPA	FEY	11	05	-01	06	20	16	39	29*	12	25	12	24	-02	00	23	15	10	02	05	03	-01						
	S2Y	04	05	06	36*	38	49	--	15	11	04	-21	20	-03	--	-07	12	01	38*	58*	91*	--	23					
	SKG	45*	21	32	37*	31	25	22	26	27	19	20	-01	26	20	31*	51*	47*	31*	25	22	21	15	-02				
	S1G	40*	38*	46*	26	43*	38	06	00	78*	39	-07	30	30	39	31	32	44	39*	64*	70*	15	13	68*	11			
	S2G	29	41	51	55*	56*	59*	64*	38	--	41	36	38	52*	44	-14	--	47	40	33	25	30	-04	50	26	25		
	S3G	37	37	--	59*	65*	69*	65*	64*	--	--	39	57*	69*	39	33	--	--	49	20	19	34	06	--	23	23	49	

* Significant at the .05 level.

Table 4-14

Intercorrelation of Cognitive Variables
Control Group

		S-B							Leiter							PPVT							ITPA					
		FEY	SEY	S2Y	SKC	S1C	S2C	S3C	FEY	SEY	S2Y	SKC	S1C	S2C	S3C	FEY	SEY	S2Y	SKC	S1C	S2C	S3C	FEY	S2Y	SKC	S1C	S2C	S3C
S-B	FEY																											
	SEY	41*																										
	S2Y	28*	52*																									
	SKC	36*	65*	57*																								
	S1C	33*	59*	40	73*																							
	S2C	30	44*	74*	59*	56*																						
	S3C	52*	59*	—	54*	47	27																					
Leiter	FEY	24*	31*	39*	40*	35*	16	09																				
	SEY	04	39*	38*	55*	41	—	—	43*																			
	S2Y	21	46*	37*	43*	34	26	—	46*	56*																		
	SKC	21	40*	46*	41*	56*	51*	15	34*	66*	28																	
	S1C	34*	39*	36	44*	43*	52*	54*	24	67*	51*	75*																
	S2C	38	62*	81*	70*	65*	58*	25	27	—	31	76*	67*															
	S3C	00	57*	—	22	25	37	54*	33	—	—	61*	54*	49														
PPVT	FEY	34*	32*	35*	43*	04	17	-15	28*	30	41*	27*	24	18	20													
	SEY	09	46*	36*	59*	24	—	—	50*	57*	57*	53*	71*	—	—	60*												
	S2Y	31*	54*	54*	59*	38	80*	—	46*	40*	49*	43*	44*	76*	—	58*	70*											
	SKC	23	52*	35*	50*	30	19	-01	22	35	36*	21	01	03	06	46*	62*	69*										
	S1C	00	32*	34	48*	70*	43*	22	13	46	26	42*	23	33	05	07	41	37	39*									
	S2C	28	33	51	39	58*	52*	12	-18	—	25	13	09	34	-12	10	—	83*	45*	50*								
	S3C	18	-04	—	27	58*	22	16	-28	—	—	-07	08	-06	-22	-21	--	—	15	46	61*								
ITPA	FEY	03	19	-05	13	29	07	-14	14	-15	19	18	00	32	-02	-09	00	12	16	16	10	-27						
	S2Y	24	37*	34*	35*	30	63	—	21	-01	35*	04	31	45	—	04	00	19	38*	26	67*	—	31*					
	SKC	06	30*	08	02	12	-11	-21	22	07	15	10	00	01	-10	-10	20	-01	10	01	-09	-27	26	16				
	S1C	17	34*	32	35*	30	36	00	18	49	53*	30	39*	16	-05	39*	71*	40	31	15	22	05	24	30	00			
	S2C	34	04	00	20	-09	04	37	15	—	-22	-07	03	-13	-09	-11	—	29	12	-20	-03	-05	-02	43	10	-01		
	S3C	-29	00	—	14	-14	05	-12	-10	—	—	-34	-28	-11	-17	-20	—	—	06	-11	-03	-15	-44	—	-26	-08	03	

* Significant at the .05 level.

Table 4-15

Correlation of Cognitive Variables with California Achievement Tests

Experimental Group

		California Achievement Test											
		S1G				S2G				S3G			
		read	arith	lang	total	read	arith	lang	total	read	arith	lang	total
S-B	FEY	59*	50*	45*	58*	61*	28	42	47*	53*	13	52*	34
	SEY	47*	45*	42*	50*	63*	45*	60*	60*	55*	33	46*	44*
	S2Y	21	25	30	28	70*	45	43	57	49	31	39	40
	SKG	46*	45*	55*	53*	58*	52*	51*	58*	57*	32	57*	47*
	S1G	61*	61*	68*	68*	69*	49*	65*	66*	59*	30	58*	47*
	S2G	62*	57*	52*	60*	61*	64*	57*	66*	51*	31	48*	43*
	S3G	73*	70*	70*	72*	66*	61*	72*	71*	54	29	57*	45
Leiter	FEY	52*	38*	46*	50*	62*	38	68*	60*	58*	42	60*	54*
	SEY	42*	59*	45*	56*	—	—	—	—	—	—	—	—
	S2Y	49*	56*	53*	58*	83*	77*	76*	82*	53	65	25	61
	SKG	53*	65*	45*	62*	46*	36	57*	50*	49*	33	47*	43*
	S1G	38*	56*	52*	52*	52*	45*	58*	55*	51*	31	53*	44*
	S2G	72*	75*	80*	79*	70*	69*	78*	78*	60*	50*	57*	58*
	S3G	23	28	20	23	09	25	27	22	20	05	19	14
PPVT	FEY	42*	19	33*	34*	42	11	31	30	38	19	38	30
	SEY	17	16	18	19	—	—	—	—	—	—	—	—
	S2Y	27	22	36	30	77*	50	58	65	67	52	56	60
	SKG	32*	30*	36*	37*	37	33	15	31	35	16	31	26
	S1G	36*	30	35*	37*	32	25	14	26	26	04	19	14
	S2G	20	09	28	21	30	22	14	24	24	06	21	15
	S3G	46	56*	56*	55*	48	56	53	56	55*	47	58*	55*
ITPA	FEY	22	-11	17	07	13	-34	26	00	04	-28	10	-11
	S2Y	04	03	30	12	47	48	35	46	41	27	40	35
	SKG	31*	12	20	23	28	-12	18	12	24	-10	29	07
	S1G	32	26	33	33	28	27	27	30	28	12	18	19
	S2G	62*	57*	59*	63*	58*	61*	56*	63*	59*	41	54*	52*
	S3G	77*	74*	73*	76*	68*	73*	69*	75*	57*	49	62*	58*

* Significant at the .05 level.

Table 4-16

Correlation of Cognitive Variables with California Achievement Tests

Control Group

		California Achievement Test											
		S1G				S2G				S3G			
		read	arith	lang	total	read	arith	lang	total	read	arith	lang	total
S-B	FEY	12	26	10	21	23	30	09	25	22	26	03	22
	SEY	50*	28*	24	40*	37	49*	33	46*	40*	31	27	34
	S2Y	43*	55*	36*	53*	68*	57	76*	71*	60	78*	73*	76*
	SKG	54*	36*	54*	54*	40*	67*	36	57*	45*	43*	28	43*
	S1G	34*	34*	48*	46*	19	47*	33	39	32	26	19	28
	S2G	37	79*	40*	61*	36	59*	42*	53*	49*	59*	57*	60*
	S3G	07	16	04	10	-06	-15	-38	-20	39	23	14	27
Leiter	FEY	39*	10	21	25	25	31	40*	35	47*	22	17	28
	SEY	72*	55*	51*	67*	—	—	—	—	—	—	—	—
	S2Y	55*	23	45*	44*	36	59	55	56	44	40	28	40
	SKG	57*	56*	47*	63*	47*	55*	58*	60*	27	37	41*	38
	S1G	46*	63*	31	59*	35	54*	38	49*	26	47*	44*	44*
	S2G	64*	72*	66*	78*	48*	64*	38	58*	40*	52*	49*	52*
	S3G	73*	60*	27	65*	39	28	19	34	60*	54*	64*	62*
PPVT	FEY	50*	25	33*	41*	53*	36	53*	51*	15	26	34	27
	SEY	70*	18	42*	44*	—	—	—	—	—	—	—	—
	S2Y	57*	42*	47*	55*	62	74*	57	72*	69*	58	55	62
	SKG	37*	19	19	29*	05	28	08	18	13	-07	-02	-02
	S1G	19	08	27	20	-04	22	20	15	05	-07	08	-01
	S2G	15	39	39	35	10	37	14	25	14	28	12	23
	S3G	-42	-46	-18	-42	-45	-11	-39	-34	-21	-31	-32	-31
ITPA	FEY	19	-08	06	04	33	26	34	34	11	13	-10	09
	S2Y	21	27	-06	17	32	64*	31	51	46	47	30	45
	SKG	12	11	-05	08	-03	-02	02	-01	-04	-13	-31	-16
	S1G	26	29	30	34*	43*	25	43*	39	24	40*	14	34
	S2G	-27	-16	-26	-26	13	20	-03	13	10	02	-20	00
	S3G	-18	00	34	03	11	06	-12	04	00	10	16	09

* Significant at the .05 level.

Table 4-17

Correlation of Cognitive Variables with Ypsilanti Rating Scale Factors[1]

Experimental Group

		Ypsilanti Rating Scale																			
		SKG					S1G					S2G					S3G				
		AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA
S-B	FEY	47*	37*	45*	3?*	28	32	06	05	22	05	34	26	28	29	20	44	35	-05	09	34
	SEY	40*	36*	50*	41*	29	44*	26	23	29	24	57*	34	52*	59*	59*	12	21	-17	07	22
	S2Y	43*	38*	46*	48*	22	38	09	-12	25	-19	54	25	38	38	35	--	--	--	--	--
	SKG	37*	36*	38*	40*	25	36*	12	23	33	21	68*	26	46*	49*	55*	39	07	-06	03	44
	S1G	54*	51*	52*	52*	27	38*	23	13	35*	00	62*	36	53*	56*	53*	34	14	-13	05	35
	S2G	27	23	40	37	32	55*	21	27	56*	18	60*	10	39	54*	34	41	13	-05	23	34
	S3G	57*	37	70*	53	43	46	31	48	72*	21	38	24	17	31	08	32	08	-04	18	21
Leiter	FEY	40*	39*	11	22	27	31	34	06	16	17	44*	35	41	16	40	00	-12	-24	-26	24
	SEY	60*	48*	36	27	55*	-13	36	-18	-20	18	--	--	--	--	--	--	--	--	--	--
	S2Y	44*	25	40*	42*	41*	37	-12	-25	03	-07	78*	30	85*	84*	67	--	--	--	--	--
	SKG	35*	24	29	20	25	45*	10	35	38*	24	21	18	25	03	13	07	-32	-19	03	13
	S1G	49*	51*	54*	34	51*	31	23	15	27	07	54*	55*	49*	43*	50*	42	11	08	24	37
	S2G	41	33	38	39	21	54*	25	40	49*	21	64*	45*	25	51*	22	53	44	22	42	48
	S3G	-17	-25	-06	16	-21	-12	00	02	36	-34	28	-46	01	54	05	13	-02	-08	25	06
PPVT	FEY	29	26	10	13	24	32	30	-05	12	07	22	47*	31	20	22	13	42	02	-01	16
	SEY	37	-05	19	36	15	21	50	04	13	06	--	--	--	--	--	--	--	--	--	--
	S2Y	24	32	25	34	13	20	13	-20	02	12	66	08	56	53	54	--	--	--	--	--
	SKG	37*	28	45*	30*	27	19	01	11	20	00	36	37	18	36	23	36	54	03	12	13
	S1G	18	19	20	25	19	23	20	04	19	-01	26	12	23	35	18	23	32	-14	23	-11
	S2G	31	20	41	37	34	17	06	-06	28	-24	23	15	20	33	22	02	22	-28	-01	-27
	S3G	36	29	47	02	18	00	05	-12	10	-14	07	35	-11	13	-19	37	29	19	26	00
ITPA	FEY	32*	07	23	31*	41*	12	16	04	27	05	-03	14	33	23	26	21	22	00	16	21
	S2Y	27	18	18	25	48*	41	29	17	39	13	64	63	41	41	55	--	--	--	--	--
	SKG	41*	25	35*	33*	18	14	-09	-08	14	-08	01	-03	-04	05	-11	36	29	-03	21	23
	S1G	22	11	26	28	25	14	24	-05	32	-19	28	19	19	47*	16	08	50	05	45	-02
	S2G	36	28	50*	40	30	45	05	37	53*	05	39	16	15	21	04	25	-10	11	29	23
	S3G	43	50	26	12	17	32	66*	23	55	-12	44	41	-06	32	-18	20	25	-02	14	25

[1] AP = Academic Potential
MP = Mother Participation
SD = Social Development
VS = Verbal Skill
EA = Emotional Adjustment

* Significant at the .05 level.

Table 4-18

Correlation of Cognitive Variables with Ypsilanti Rating Scale Factors[1]

Control Group

		Ypsilanti Rating Scale																			
		SKG					S1G					S2G					S3G				
		AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA
S-B	FEY	03	12	20	01	28*	00	14	-09	-09	05	-08	27	08	-06	04	03	-02	26	-12	04
	SEY	46*	23	42*	44*	30*	21	39*	17	20	32*	36	24	34	29	34	57*	17	46	46	37
	S2Y	36*	15	27	25	38*	34	33	03	22	29	66*	39	54	54	53	—	—	—	—	—
	SKG	45*	40*	50*	44*	49*	37*	39*	28	33*	41*	28	39	38	18	29	54*	27	50	30	45
	S1G	59*	28	59*	56*	60*	31	38*	36*	42*	32*	22	25	39	24	33	43	26	40	41	47
	S2G	46*	10	55*	49*	59*	58*	18	37	45*	46*	47*	-03	59*	41*	37	39	-13	18	26	45
	S3G	03	07	-10	-32	00	-24	-13	-24	13	-39	-01	01	-04	-39	02	13	-30	16	-23	-12
Leiter	FEY	34*	22	22	09	27*	32	24	25	25	25	36	43*	15	12	19	60*	26	54*	28	59*
	SEY	64*	38*	22	22	54*	61*	57*	79*	66*	78*	—	—	—	—	—	—	—	—	—	—
	S2Y	57*	45*	44*	34*	48*	41	30	25	49*	16	-10	-11	-20	31	12	—	—	—	—	—
	SKG	50*	23	38*	28*	40*	56*	45*	50*	47*	55*	54*	22	52*	27	68*	45	40	30	48	60*
	S1G	39*	40*	29	15	35*	42*	34*	25	35*	31	23	-03	29	01	48*	40	-07	32	17	43
	S2G	50*	40	44*	45*	58*	61*	63*	38	36	59*	53*	19	51*	19	41*	67*	31	54*	50	65*
	S3G	46	53*	41	29	39	37	27	24	47	-12	60*	-12	43	13	43	31	-12	07	11	26
PPVT	FEY	30*	27	39*	37*	32*	35*	34*	14	29	19	13	-01	08	36	35	-43	-20	-40	-13	-21
	SEY	50*	31	15	20	37*	53	46	41	45	43	—	—	—	—	—	—	—	—	—	—
	S2Y	40*	24	32*	35*	32	38	24	26	18	43*	61	02	42	69*	12	—	—	—	—	—
	SKG	31*	22	35*	37*	28*	02	21	16	23	19	13	-13	07	50*	10	-37	19	-51*	-03	-22
	S1G	37*	00	35*	48*	24	25	19	39*	46*	38*	09	09	35	35	34	-06	20	-16	18	04
	S2G	23	-11	29	36	41*	12	21	19	26	30	19	-23	19	37	-02	-25	05	-32	06	-22
	S3G	-10	-45	-06	-02	-03	-21	02	15	11	-27	-40	05	-17	-13	-08	-07	-14	03	11	14
ITPA	FEY	36*	18	21	21	22	20	24	19	07	41*	27	19	13	19	03	18	55*	21	08	33
	S2Y	21	13	22	17	22	27	14	15	14	34	31	-31	00	49	-15	—	—	—	—	—
	SKG	00	02	09	-15	02	-02	12	-02	-09	19	10	34	12	03	-11	08	35	22	16	20
	S1G	62*	47*	32*	49*	49*	54*	43*	25	36*	21	15	18	06	14	17	-06	08	-10	11	-13
	S2G	-25	-02	-18	-36	-24	-11	-33	-14	-29	12	01	00	02	-04	-11	-18	-01	-15	-52*	-25
	S3G	-17	-25	-19	00	-23	-07	01	08	01	03	28	06	36	42	20	34	-15	14	31	00

[1] AP = Academic Potential
MP = Mother Participation
SD = Social Development
VS = Verbal Skill
EA = Emotional Adjustment

* Significant at the .05 level.

Table 4-19

Correlation of Cognitive Variables with Preschool Ypsilanti Rating Scale Factors[1]

Experimental Group

		Ypsilanti Rating Scale											
		FEY			SEY			F2Y			S2Y		
		AP	MP	SE	AP	MP	SE	AP	MP	SE	AP	MP	SE
S-B	FEY	39*	27*	47*	38*	18	51*	43*	03	36*	38*	18	30
	SEY	44*	35*	47*	40*	33*	37*	43*	19	32*	53*	30	35*
	S2Y	45*	38*	44*	31*	12	32*	25	14	22	34*	25	32
	SKG	45*	27	49*	44*	15	40*	58*	22	51*	56*	44*	56*
	S1G	48*	21	62*	46*	30	55*	58*	12	49*	55	40	45
	S2G	39	35	41	52*	48*	38	79*	52	78*	—	—	—
	S3G	64*	58*	51	62*	70*	38	—	—	—	—	—	—
Leiter	FEY	44*	37*	32*	42*	30*	27*	20	21	20	36*	32	29
	SEY	46*	51*	44*	31	39*	15	23	31	18	43*	42*	22
	S2Y	26	00	31*	15	-01	10	14	-04	10	16	13	18
	SKG	25	21	26	19	17	23	22	-12	17	37	40*	36
	S1G	46*	29	56*	11	37*	24	13	29	19	19	59*	17
	S2G	48*	31	39	45*	45*	32	85*	48	81*	—	—	—
	S3G	02	18	06	05	17	-09	—	—	—	—	—	—
PPVT	FEY	20	23	24	25	10	29*	21	-06	10	22	16	18
	SEY	26	23	27	24	23	15	-01	02	-08	12	01	-01
	S2Y	36*	25	33*	50*	19	44*	42*	24	27	48*	29	24
	SKG	52*	16	40*	42*	14	37*	62*	19	56*	61*	44*	60*
	S1G	17	15	45*	34	14	44*	45*	03	44	12	-03	17
	S2G	18	30	35	32	09	39	50	00	45	—	—	—
	S3G	28	59*	34	28	52	17	—	—	—	—	—	—
ITPA	FEY	28*	11	30*	28*	03	25	-03	-05	-12	-06	-04	-16
	S2Y	-17	09	-09	-17	-12	-11	-16	20	08	04	06	24
	SKG	41*	36*	40*	49*	19	52*	49*	22	31	49*	33	28
	S1G	33	26	48*	35*	25	38*	43	27	41	41	77*	30
	S2G	36	27	22	39	34	16	82*	13	59	—	—	—
	S3G	47	54	25	39	67*	22	—	—	—	—	—	—

[1] AP = Academic Potential MP = Mother Participation SE = Socio-Emotional Adjustment

* Significant at the .05 level.

Table 4-20

Correlation of Cognitive Variables with Preschool Pupil Behavior Inventory Factors[1]

		Pupil Behavior Inventory									
		SEY					S2Y				
		CC	AM	SES	TD	PB	CC	AM	SES	TD	PB
S-B	FEY	-01	34*	39*	18	08	03	28	31*	-07	10
	SEY	-23	46*	42*	18	23	07	50*	34*	15	28
	S2Y	-25	47*	44*	28	11	15	48*	30*	13	18
	SKG	-20	46*	52*	27	08	-05	56*	46*	21	28
	S1G	00	53	31	00	09	-05	60*	37	48*	09
	S2G	--	--	--	--	--	43	84*	91*	43	38
	S3G	--	--	--	--	--	--	--	--	--	--
Leiter	FEY	09	45*	30	09	30	10	41*	16	00	21
	SEY	-21	41*	19	00	19	-05	46*	22	17	38*
	S2Y	-26	28	13	-06	01	00	53*	24	13	01
	SKG	03	38	28	21	16	14	17	12	02	11
	S1G	-19	16	07	27	02	-14	22	06	39	19
	S2G	--	--	--	--	--	14	60	73*	75*	23
	S3G	--	--	--	--	--	--	--	--	--	--
PPVT	FEY	-01	03	04	-06	16	04	26	30*	-06	25
	SEY	-31	45*	18	17	-08	-14	39*	02	-06	04
	S2Y	-25	55*	46*	31	09	-15	49*	32*	-03	17
	SKG	-44*	39	43*	-10	20	-12	57*	53*	24	30
	S1G	22	17	-01	-24	-05	-06	48*	38	23	-01
	S2G	--	--	--	--	--	-31	46	41	16	-15
	S3G	--	--	--	--	--	--	--	--	--	--
ITPA	FEY	-25	13	-08	-07	-23	-27	10	-24	-29	-23
	S2Y	-10	-11	-08	-03	-12	01	07	02	-05	04
	SKG	-17	56*	63*	10	34	-11	48*	39*	-10	27
	S1G	-28	45	13	-13	32	-30	44	33	19	-09
	S2G	--	--	--	--	--	-21	72*	68	34	-07
	S3G	--	--	--	--	--	--	--	--	--	--

[1] CC = Classroom Conduct
AM = Academic Motivation
SES = Socio-emotional State
TD = Teacher Dependence
PB = Personal Behavior

* Significant at the .05 level.

Table 4-21

Correlation of Cognitive Variables with Pupil Behavior Inventory[1]

Experimental Group

		Pupil Behavior Inventory																			
		SKG					S1G					S2G					S3G				
		CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB
S-B	FEY	-05	27	42*	09	04	20	23	09	35*	06	42	26	24	22	01	33	27	00	48	-02
	SEY	08	26	31*	-05	17	24	33	27	38*	38*	47*	47*	60*	17	34	10	-01	23	35	-10
	S2Y	09	43*	46*	08	14	-24	22	18	51*	11	52	45	32	43	-03	--	--	--	--	--
	SKG	02	35*	37*	-11	28	17	32	17	30	33	22	61*	41	10	19	31	39	24	44	31
	S1G	11	37*	35*	10	37*	08	42*	23	46*	35*	32	56*	48*	16	25	24	24	18	48	17
	S2G	-04	34	29	-14	18	22	40	01	26	27	29	56*	53*	06	03	04	30	28	43	12
	S3G	-01	64*	23	-21	26	25	42	08	38	49	26	43	47	07	01	[illegible]	17	25	33	-03
Leiter	FEY	22	45*	25	13	33*	29	32	20	44*	40*	53*	33	20	37	32	37	03	13	06	27
	SEY	-05	39	33	00	26	11	24	02	40	13	--	--	--	--	--	--	--	--	--	--
	S2Y	13	48*	45*	06	20	-16	17	-09	30	13	66	78*	76*	47	28	--	--	--	--	--
	SKG	13	30*	02	01	18	38*	28	25	33	26	29	06	10	24	03	19	04	38	34	-17
	S1G	14	46*	24	03	33	11	37*	12	44*	31	36	54*	48*	24	31	34	30	33	58*	-09
	S2G	30	35	14	02	15	19	53*	30	-10	46*	23	60*	38	-05	14	03	66*	17	13	43
	S3G	-33	-17	-26	-25	06	01	-08	-19	-08	-03	-44	11	30	-56*	-20	-31	10	17	24	15
PPVT	FEY	-14	14	12	09	01	04	25	-01	36*	17	47*	33	17	36	34	44	16	-21	13	-03
	SEY	-27	26	16	07	03	-16	21	-14	37	-08	--	--	--	--	--	--	--	--	--	--
	S2Y	-11	16	41*	-18	18	-13	-02	05	21	17	52	59	41	44	06	--	--	--	--	--
	SKG	-06	33*	38*	-07	28	-18	06	04	-02	23	-02	43*	19	-03	05	05	43	-35	00	04
	S1G	-28	-04	12	-04	07	-14	14	00	23	08	14	26	28	06	-03	-22	03	-22	27	-34
	S2G	-44*	04	16	-03	-03	-32	12	-07	28	-15	11	24	24	00	09	-30	-13	-33	11	-21
	S3G	05	53	22	-04	06	-12	-01	-30	06	28	04	37	13	-07	-02	-18	29	-06	07	-02
ITPA	FEY	-18	25	23	05	-03	01	17	-01	23	-03	23	-10	27	17	21	19	-15	23	58*	-37
	S2Y	-13	34	19	02	16	-14	43	19	35	-18	43	57	40	51	31	--	--	--	--	--
	SKG	-18	13	33*	06	15	-21	03	-06	-03	01	02	-08	-18	20	-04	-10	11	02	19	13
	S1G	-34*	-03	01	-18	-05	-16	19	06	07	06	08	24	37	-28	04	-34	11	-02	07	-17
	S2G	10	42	38	-27	44*	01	35	04	00	15	-04	30	22	-05	-27	-18	20	42	09	22
	S3G	-13	43	-07	-18	32	10	45	06	36	75*	14	64*	32	-04	13	13	28	01	07	26

[1] CC = Classroom Conduct AM = Academic Motivation SES = Socio-emotional State
TD = Teacher Dependence PB = Personal Behavior

*Significant at the .05 level.

Table 4-12

Correlation of Cognitive Variables with Pupil Behavior Inventory[1]

Control Group

		Pupil Behavior Inventory																			
		S1C					S1G					S2C					S3C				
		CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB
S-B	PRY	-02	17	-04	00	07	04	-09	-07	-02	-03	24	-05	28	04	02	29	19	12	-15	22
	SRY	09	32*	22	05	12	10	18	26	04	29	29	31	52*	25	37	25	59*	31	20	27
	S2Y	-02	36*	42*	-10	39*	35	21	-15	-01	-03	09	67*	17	-53	44	--	--	--	--	--
	SRG	44*	55*	37*	11	52*	27	43*	24	09	34*	24	20	34	16	38	48	66*	05	26	54*
	S1G	33	51*	42*	22	39*	-03	24	31	-02	23	03	16	46*	28	18	00	54*	41	00	23
	S2G	14	51*	31	20	32	00	44*	35	33	22	03	55*	50*	-05	22	-04	30	-03	45	33
	S3G	42	25	01	24	06	-25	-30	07	-30	-21	17	-28	-16	38*	-27	15	27	-05	20	30
Letter	PRY	32*	39*	31*	08	32*	23	34*	08	-03	28	10	30	38	12	44*	20	62*	57*	26	50
	SRY	34	62*	35	13	47*	45	45	31	23	52	--	--	--	--	--	--	--	--	--	--
	S2Y	19	46*	57*	-16	50*	30	37	25	16	29	04	08	13	-49	38	--	--	--	--	--
	SRG	19	46*	36*	01	32*	30	47*	35*	31	41*	17	51*	27	41*	48*	06	49	58*	29	-12
	S1G	40*	46*	32	22	34*	27	29	18	18	24	26	17	-05	34	24	19	53*	28	36	07
	S2G	52*	67*	39	24	58*	37	55*	49*	09	62*	22	45*	18	29	49*	40	69*	40	23	01
	S3G	17	66*	43	21	16	-15	27	49	07	15	09	54*	27	71*	40	06	38	21	32	00
PPVT	PRY	03	14	23	-23	12	14	38*	11	06	-06	02	21	30	-12	27	-13	-46	-12	00	-36
	SRY	30	31	39*	04	42*	48	36	03	16	23	--	--	--	--	--	--	--	--	--	--
	S2Y	08	23	47*	-24	30	33	46*	17	25	26	-16	71*	66*	-55	38	--	--	--	--	--
	SRG	-12	17	16	01	08	-06	14	06	19	12	-16	19	35*	-16	03	-17	-39	-34	-06	-27
	S1G	17	14	13	21	05	03	24	22	08	12	-15	05	26	15	-10	-27	-07	-13	04	-23
	S2G	-18	17	03	22	-09	-18	-32	37	16	01	-31	29	31	-17	-08	-35	-16	11	-35	-30
	S3G	-19	-49	-38	-09	-34	-43	-33	25	-23	-21	-21	-44	45	13	-39	-35	-09	11	-57*	10
ITPA	PRY	23	16	15	06	20	31	34*	22	12	44*	23	38	32	-05	20	54*	33	60*	07	05
	SRY	-13	26	16	07	20	07	41	19	31	14	-45	46	24	-63	13	--	--	--	--	--
	S2Y	10	00	-01	06	00	28	-03	-07	12	12	06	07	12	-04	06	22	-03	25	-04	08
	SRG	18	35*	05	-09	13	23	32*	00	16	16	33	36	17	-15	31	09	-05	29	-05	03
	S1G	20	-10	-05	12	-07	19	-03	-30	06	-19	22	-01	-03	-07	-13	33	14	-21	18	27
	S2G	-12	18	12	-21	-01	00	02	-03	-10	24	31	-03	15	-16	34	-13	22	19	25	17

[1] CC = Class Conduct AM = Academic Motivation SES = Socio-emotional State
TD = Teacher Dependence PB = Personal Behavior

* Significant at the .05 level.

Table 4-23

Correlation of Cognitive Variables with Home Background Variables

Experimental Group

		DEMOG												CRES						INVENTORY			
		Mother Age	No. Children	Mother Educ	C.D.	Father Age	Father Educ	Child's C.A.	No Younger sibs	No. Older sibs	Father in home	Welfare	No. sibs	Avail & Use	Educ Expec	Mat. Provided	Educ Concern	Educ Efforts	Total	FEY I	FEY II	SEY I	SEY II
S-B	FEY	09	-26*	19	24	06	-21	-09	-40*	-08	-11	14	-22	20	08	14	09	13	24	12	00	-01	-16
	SEY	-14	-25	34*	31*	21	-13	-25	-29*	-13	-29*	-13	-24	02	-12	-02	-01	-07	-06	14	12	-05	-16
	S2Y	-14	-10	07	14	-15	06	-18	-14	-03	-17	-08	-04	33	18	-03	12	-10	25	00	-05	-49*	03
	SKG	-26	-17	18	29*	11	07	-19	-27	-05	-13	13	-13	09	-06	00	10	05	06	00	00	-02	-04
	S1G	-07	-14	23	39*	09	00	-15	-39*	07	01	32	-05	09	15	-09	-04	15	11	-03	09	-14	09
	S2G	13	-27	00	36	07	00	-26	-45*	-03	-15	27	-26	-06	22	-16	-22	04	-04	09	16	-07	-03
	S3G	-08	-39	10	44	-32	01	19	-31	-19	-06	32	-43	-03	07	-42	-34	07	-10	00	23	-19	10
Letter	FEY	-06	-06	22	19	-18	05	26*	-03	-03	04	21	-11	20	17	-04	05	00	18	02	05	-14	-08
	SEY	-28	-28	45*	21	08	-02	00	-04	-31	-10	09	-34*	34	25	19	16	27	43*	-02	-07	-02	-10
	S2Y	-34*	-02	06	09	-34	21	-07	01	-02	-06	28	-01	18	19	-07	-11	02	12	-18	-11	-44*	05
	SKG	-27	-15	23	19	06	-14	-11	-28	-05	00	12	-21	09	09	-13	00	-06	04	07	19	03	-24
	S1G	-20	-20	29	38*	-03	12	-13	-31	-08	00	17	-09	34	16	-12	07	15	28	-07	09	-03	-01
	S2G	06	19	20	23	26	-31	33	-22	26	-14	-04	12	00	-02	-29	-28	-31	-30	-07	-14	-07	41
	S3G	-34	24	-20	18	-10	-15	-27	32	-01	43	15	-19	-29	42	-23	01	-13	-08	26	17	07	37
PPVT	FEY	13	-24	14	20	05	09	-10	-40*	-05	-01	07	-17	28	15	04	-03	21	27	14	-42*	17	03
	SEY	-16	-09	02	16	-19	28	11	02	-09	-23	02	-05	00	27	-16	23	29	19	-13	05	-27	28
	S2Y	-07	-11	30*	30*	25	15	-08	-20	-02	-39*	-07	-07	23	-02	06	08	16	18	11	-16	-18	-11
	SKG	-16	-23	38*	35*	24	10	-14	-28	-11	-28	04	-16	22	-04	22	01	15	21	06	-17	06	01
	S1G	19	-29	09	31	07	00	-27	-43*	-02	-11	14	-12	-07	20	-03	06	17	08	13	-02	06	09
	S2G	13	-33	-19	12	-14	22	-35	-29	-13	00	05	-10	02	09	-10	37	34	23	26	-03	21	24
	S3G	18	-20	22	11	-12	35	44	-33	-03	04	52	-35	30	02	01	-12	01	17	-10	-19	05	03
ITPA	FEY	-01	-09	03	06	-14	23	44*	-09	-01	-18	-06	09	12	-08	-12	-04	-03	-02	-12	-03	-18	13
	S2Y	-04	-10	14	16	-53*	22	04	01	-11	10	14	-09	21	19	-06	23	-02	23	05	-12	-05	08
	SKG	00	02	18	07	04	-10	11	-13	11	10	34*	01	14	19	36*	38*	05	37*	-01	-13	-41*	33*
	S1G	04	-06	12	10	-25	07	-05	05	-07	-01	-14	09	05	00	-01	00	-07	00	16	-10	16	29
	S2G	-25	-27	09	41	-15	-07	10	-09	-20	-13	09	-26	03	18	-40	17	21	07	04	40	-23	13
	S3G	-23	-32	35	59*	-32	-18	25	-19	-22	29	29	-51	-04	49	01	-68*	09	13	45	-30	21	37

* Significant at the .05 level.

Table 4-24

Correlation of Cognitive Variables with Home Background Variables

Control Group

		DEMOG												CHES						INVENTORY			
		Mother Age	No Children	Mother Educ	C.D.	Father Age	Father Educ	Child's C.A.	No Younger Sibs	No Older Sibs	Father in home	Welfare	No Sibs	Avail & Use	Educ Expec	Mat Provided	Educ Concern	Educ Efforts	Total	FEY I	FEY II	SEY I	SEY II
S-B	FEY	13	17	08	12	06	07	-36*	-24*	25*	-08	04	17	20	06	-08	-08	-20	02	-07	24	-09	-08
	SEY	11	04	18	18	14	14	-19	-35*	14	02	14	05	46*	31*	00	13	-08	39*	14	19	07	-22
	S2Y	02	01	23	28*	-07	19	-06	-13	04	07	00	-03	30	41*	03	26	04	47*	06	34*	39*	-12
	SKG	02	-17	26	31*	05	-06	-18	-23	-09	07	30*	-13	21	35*	27	17	-05	39*	21	32*	33*	-35*
	S1G	-05	-13	12	25	-07	-11	00	-47*	03	-18	-07	06	14	42*	20	-25	-44*	18	-03	36*	11	-24
	S2G	-18	-17	38	29	07	23	-34	-23	-06	-40*	05	-18	-21	52*	17	-33	20	23	05	29	42	-24
	S3G	-29	-41	-12	09	20	09	-68*	-35	-25	-11	23	-23	48	48	16	-13	-15	33	24	48	-25	-36
Letter	FEY	-16	01	22	31*	-24	36*	13	-06	03	-13	-19	-01	33*	04	06	14	-07	21	14	15	17	-26
	SEY	13	02	33*	43*	-40	21	-03	-12	05	21	16	11	39*	35*	44*	00	-04	48*	52*	-02	46*	-18
	S2Y	06	-02	25	28*	-09	10	-05	-28*	08	-02	-10	-02	43*	10	09	20	-08	33*	22	20	52*	-30
	SKG	00	00	31*	26	-06	07	-11	-23	06	09	07	02	41*	43*	34*	05	13	55*	22	03	37*	-24
	S1G	-02	05	33*	23	00	-03	-28	-27	13	03	12	08	33	32	02	02	05	41*	18	05	27	-23
	S2G	-04	-25	45*	34	-10	14	-25	-33	-12	-04	16	-25	20	49	18	-29	11	36	-03	47*	26	-39
	S3G	-35	-24	31	06	-02	47	-33	23	-28	01	14	-16	14	26	19	-09	24	29	29	28	-08	-14
PPVT	FEY	20	01	08	05	19	-06	-35*	-15	06	11	17	-03	22	-05	09	39*	10	25	19	15	24	-14
	SEY	11	03	18	29	07	10	-18	-15	07	18	17	03	58*	00	30	21	-04	42*	60*	-03	58*	-44*
	S2Y	10	12	08	05	25	-08	05	-14	15	12	-05	04	59*	01	28	14	-12	39*	37*	06	57*	-36*
	SKG	18	05	02	00	35	02	18	-15	08	22	22	04	44*	-23	10	14	-20	11	25	01	26	-17
	S1G	-07	00	-08	01	01	-21	21	-26	07	-10	-29	10	-06	15	27	-06	-34	01	05	06	20	-16
	S2G	12	-01	-04	-01	69*	-39	-16	-43*	13	-19	08	04	-18	-01	-16	-27	-43	-36	16	06	43	-37
	S3G	-11	-11	-38	11	-10	-33	-36	-17	-04	-11	-12	18	00	42	-20	32	-46	12	32	-31	05	-09
ITPA	FEY	14	10	-01	-18	09	12	45*	-06	11	09	-03	06	13	-12	08	-25	01	-05	-17	13	-04	-05
	S2Y	00	17	24	11	25	19	26	-10	21	-05	15	12	17	-04	-06	07	-11	02	08	06	21	-18
	SKG	03	16	06	04	-12	50*	23	-26	25	-04	08	22	29	-15	20	-13	-06	06	-12	05	-19	-03
	S1G	32	28	07	06	44	00	-09	-31	38*	08	23	35*	35	19	-16	-24	04	20	11	05	14	31
	S2G	-13	-15	-02	13	29	08	-11	-05	-14	-17	04	-17	-11	06	-24	00	-08	-11	39	-11	03	-04
	S3G	-25	-31	34	46	-31	-04	15	27	-35	-11	08	-50	-31	22	24	37	35	25	14	43	19	-17

* Significant at the .05 level.

Table 4-25

Intercorrelation of California Achievement Tests

Experimental Group

California Achievement Test			California Achievement Test											
			S1G				S2G				S3G			
			read	arith	lang	total	read	arith	lang	total	read	arith	lang	total
California Achievement Test	S1G	read												
		arith	68*											
		lang	79*	64*										
		total	91*	89*	88*									
	S2G	read	91*	79*	87*	90*								
		arith	66*	70*	63*	70*	74*							
		lang	88*	75*	86*	87*	88*	73*						
		total	88*	81*	85*	89*	94*	89*	93*					
	S3G	read	83*	79*	79*	85*	88*	77*	87*	81*				
		arith	58*	63*	59*	64*	77*	85*	74*	85*	80*			
		lang	79*	79*	77*	81*	79*	67*	82*	82*	96*	69*		
		total	74*	75*	73*	78*	86*	85*	85*	92*	95*	94*	88*	

* Significant at the .05 level.

Table 4-26

Intercorrelation of California Achievement Tests

Control Group

California Achievement Test			California Achievement Test											
			S1G				S2G				S3G			
			read	arith	lang	total	read	arith	lang	total	read	arith	lang	total
California Achievement Test	S1G	read												
		arith	58*											
		lang	68*	50*										
		total	85*	87*	80*									
	S2G	read	67*	48*	57*	65*								
		arith	70*	60*	49*	68*	66*							
		lang	63*	56*	57*	67*	75*	68*						
		total	75*	61*	60*	74*	88*	91*	87*					
	S3G	read	69*	50*	49*	65*	58*	51*	53*	60*				
		arith	62*	78*	60*	77*	67*	56*	57*	67*	81*			
		lang	75*	71*	56*	79*	63*	49*	59*	62*	76*	79*		
		total	70*	75*	60*	80*	68*	57*	60*	68*	89*	97*	88*	

* Significant at the .05 level.

Table 4-27

Correlation of California Achievement Test with Ypsilanti Rating Scale Factors[1]

Experimental Group

California Achievement Test		Ypsilanti Rating Scale																			
		S1C					S1C					S2C					S3C				
		AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA
		read	47*	32*	31*	28	31*	53*	15	22	44*	09	65*	50*	49*	50*	35	45	35	10	17	53
	S1G	arith	28	11	25	14	24	31	17	17	22	04	54*	40	27	40	15	53	37	16	18	46
		lang	42*	38*	24	27	32*	51*	26	26	37*	19	73*	68*	50*	58*	46*	64*	51	25	33	59*
		total	42*	28	30	25	32*	49*	21	23	37*	11	67*	56*	45*	52*	34	55*	43	18	24	54
		read	53*	46*	49*	45*	45*	76*	03	18	46*	08	78*	53*	64*	54*	51*	44	13	07	00	52
	S2G	arith	30	40	34	20	28	60*	15	25	50*	C	71*	42	47*	46*	33	21	-05	08	12	24
		lang	61*	47*	36*	50*	49*	70*	21	32	59*	12	75*	51*	65*	56*	53*	46	22	25	23	55
		total	51*	48*	50*	41	43	74*	13	27	54*	10	81*	52*	63*	56*	49*	38	09	14	13	45
		read	30	34	35	18	21	49*	06	18	31	04	66*	41	45*	34	38	41	10	16	12	40
	S3G	arith	18	31	23	05	17	46*	16	09	18	05	65*	41	55*	40	42	19	-16	23	10	20
		lang	32	33	34	12	21	39	13	21	26	05	57*	37	32	21	28	49	20	23	15	48
		total	26	35	31	10	20	48*	14	15	24	05	68*	43*	51*	37	41	35	00	22	13	34

[1] AP = Academic Potential MP = Mother Participatior SD = Social Development
VS = Verbal Skill EA = Emotional Adjustment

* Significant at the .05 level.

Table 4-28

Correlation of California Achievement Test with Ypsilanti Rating Scale Factors[1]

Control Group

California Achievement Test		Ypsilanti Rating Scale																			
		S1C7					S1C					S2C					S3G				
		AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA	AP	MP	SD	VS	EA
816	read	63*	41*	54*	37*	49*	46*	56*	30	37*	41*	55*	14	26	25	35	28	11	01	12	39
	arith	29*	22	39*	16	43*	34*	38*	20	25	29	48*	03	49*	30	43*	56*	19	36	31	48
	lang	44*	32*	44*	38*	49*	40*	51*	29	40*	42*	48*	27	21	31	41*	52*	20	33	41	29
	total	56*	36*	52*	32*	56*	48*	58*	31	40*	45*	53*	17	37	33	46*	49	18	23	30	45
820	read	69*	51*	61*	46*	56*	57*	42*	37	38	51*	69*	17	48*	49*	57*	16	04	-12	14	27
	arith	79*	46*	68*	54*	49*	63*	39	37	38	50*	49*	08	48*	47*	38	29	50	-05	22	58*
	lang	71*	48*	75*	68*	47*	59*	28	32	43*	39	49*	19	37	54*	61*	-03	31	-23	09	19
	total	74*	54*	76*	62*	57*	70*	41*	40	44*	53*	62*	15	51*	55*	55*	19	33	-14	18	47
824	read	57*	65*	58*	36	59*	52*	32	26	49*	-01	48*	23	30	11	28	28	00	09	-08	25
	arith	52*	64*	46*	36	69*	74*	52*	40*	35*	17	51*	17	37	17	32	38	04	13	11	34
	lang	47*	41*	45*	35	48*	57*	41*	36	55*	21	56*	-02	41*	27	51*	20	-28	-06	07	15
	total	55*	62*	51*	38	67*	70*	49*	38	57*	34	54*	15	38	19	37	35	-03	10	06	30

[1] AP = Academic Potential MP = Mother Participation SD = Social Development
VS = Verbal Skill EA = Emotional Adjustment

* Significant at the .05 level.

Table 4-29

Correlation of California Achievement Test with Preschool Ypsilanti Rating Scale Factors[1]

Experimental Group

California Achievement Test			Ypsilanti Rating Scale											
			FEY			SEY			F2Y			S2Y		
			AP	MP	SE	AP	MP	SE	AP	MP	SE	AP	MP	SE
	S1G	read	35*	10	38*	54*	28	44*	47*	-23	39*	22	11	18
		arith	16	00	27	21	11	28	32	-18	30	18	22	26
		lang	37*	07	38*	39*	15	36*	22	-15	19	00	02	-03
		total	31	05	38*	41*	20	40*	38*	-20	33	16	15	18
	S2G	read	54*	24	39	61*	30	46*	71*	16	54	—	—	—
		arith	32	29	15	41	42*	13	68	33	72*	—	—	—
		lang	67*	41	51*	66*	45*	47*	79*	36	72*	—	—	—
		total	54*	34	37	60*	44*	38	75*	28	67	—	—	—
	S3G	read	42	44*	40	40	42	28	77*	42	62	—	—	—
		arith	30	24	12	35	35	14	60	44	58	—	—	—
		lang	39	49*	40	31	41	23	63	44	52	—	—	—
		total	38	37	27	38	41	21	69	47	63	—	—	—

[1] AP = Academic Potential MP = Mother Participation SE = Socio-Emotional Adjustment

* Significant at the .05 level.

Table 4-30

Correlation of California Achievement Test with Preschool Pupil Behavior Inventory Factors[1]

Experimental Group

California Achievement Test		Pupil Behavior Inventory									
		SEY					S2Y				
		CC	AM	SES	TD	PB	CC	AM	SES	TD	PB
S1G	read	32	42*	20	-22	14	26	53*	32	03	14
	arith	24	41	34	25	14	04	28	20	07	01
	lang	22	22	00	13	-25	04	30	00	05	-08
	total	29	41	23	08	05	12	40*	20	06	03
S2G	read	—	—	—	—	—	30	83*	77*	23	00
	arith	—	—	—	—	—	23	67	68	58	23
	lang			—	—	—	31	79*	79*	52	17
	total			—	—	—	29	79*	77*	44	12
S3G	read			—	—	—	23	84*	79*	33	10
	arith	—	—	—	—	—	38	71*	66	46	27
	lang	—	—	—	—	—	13	67	64	23	07
	total	—	—	—	—	—	33	79*	74*	42	21

[1] CC = Classroom Conduct AM = Academic Motivation SES = Socio-Emotional State
TD = Teacher Dependence PB = Personal Behavior

* Significant at the .05 level.

Table 4-31

Correlation of California Achievement Test with Pupil Behavior Inventory Factors[1]

Experimental Group

California Achievement Test			Pupil Behavior Inventory																	
			S1G					S2G					S3G							
			CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB
	S1G	read	24	50*	34*	-05	24	38*	51*	23	13	27	39	57*	43*	07	13	38	55*	17	30	41
		arith	10	26	12	03	02	33	39*	15	14	26	19	53*	38	-17	-03	27	61*	03	25	44
		lang	27	40*	19	03	20	28	55*	36*	15	34*	39	68*	49*	07	27	29	69*	14	31	46
		total	21	42*	24	00	16	36*	51*	25	14	31	34	62*	45*	00	13	32	63*	11	29	44
	S2G	read	41	64*	58*	20	24	32	58*	19	34	18	58*	69*	53*	21	18	54	58*	14	32	48
		arith	32	64*	33	-17	37	26	38	13	24	27	33	73*	52*	00	08	15	48	19	03	39
		lang	44*	65*	48*	05	27	40	68*	34	32	39	49*	68*	59*	13	30	35	54	39	40	49
		total	42	69*	50*	03	32	35	59*	23	32	29	50*	76*	58*	12	20	35	57*	25	25	48
	S3G	read	35	55*	35	10	32	46*	45*	10	34	24	30	57*	32	00	03	40	60*	15	30	43
		arith	47*	59*	27	07	36	32	34	14	15	29	31	68*	47*	-03	09	34	55*	15	08	37
		lang	31	53*	34	15	26	47*	48*	10	38	28	25	52*	22	05	03	42	60*	16	34	50
		total	47*	60*	33	10	35	41	43*	13	26	30	32	66*	41	00	07	40	61*	16	22	44

[1] CC = Classroom Conduct AM = Academic Motivation SES = Socio-Emotional State
TD = Teacher Dependence PB = Personal Behavior

*. Significant at the .05 level.

Table 4-32

Correlation of California Achievement Test with Pupil Behavior Inventory Factors[1]

Control Group

California Achievement Test		Pupil Behavior Inventory																			
		S1G					S2G					S3G									
		CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB	CC	AM	SES	TD	PB
	read	[illegible]	62*	46*	-05	48*	29	57*	39*	27	46*	13	60*	31	19	67*	30	26	06	48	-03
S1G	arith	07	45	31	-14	30*	09	33*	29	23	25	03	54*	19	-08	38	28	60*	28	65*	15
	lang	32*	51*	46*	-11	46*	38*	38*	27	13	50*	11	45*	15	-07	61*	02	56*	18	27	-12
	total	22	60*	45*	-12	46*	28	50*	38*	26	47*	11	62*	26	02	64*	25	51*	18	54*	00
	read	42*	59*	45*	20	29	46*	79	34	45*	43*	56*	66*	41	14	75*	21	25	15	61*	-07
S2G	arith	33	66*	41*	27	40	18	72*	42*	47*	26	18	58*	43	00	62*	43	42	16	43	08
	lang	20	51*	61*	06	29	21	61*	19	32	16	24	62*	47*	-14	65*	-09	05	44	41	-15
	total	37	68*	53*	22	38	31	76*	38	48*	32	35	68*	48*	01	75*	25	31	26	56*	-03
	read	23	76*	57*	31	57*	00	51*	34	16	30	19	54*	39	23	62*	19	41	04	63*	54*
S3G	arith	19	70*	52*	32	45*	11*	60*	49*	24	36	20	58*	21	11	61*	23	51*	25	64*	45
	lang	06	64*	62*	09	38	-01	53*	42*	19	32	14	57*	31	21	59*	-12	15	-11	61*	13
	total	19	73*	57*	29	48*	07	60*	48*	23	36	20	61*	29	16	65*	15	44	13	68*	44

[1] CC = Classroom Conduct AM = Academic Motivation SES = Socio-emotional State
TD = Teacher Dependence PB = Personal Behavior

* Significant at the .05 level.

Table 4-33

Correlation of California Achievement Test with Home Background Variables

Experimental Group

California Achievement Test			DEMOG												CHES						INVENTORY				
			Mother Age	No. Children	Mother Educ	C.B.	Father Age	Father Educ	Child's C.A.	No. Younger Sibs	No. Older Sibs	Father in Home	Welfare	No. Sibs	Avail & Use	Educ Expec	Mat Provided	Educ Concern	Educ Efforts	Total	PET I	PET II	SET I	SET II
	1/6	read	-13	-19	33*	33*	05	-14	11	-34*	00	06	37*	-20	22	19	-06	-04	-08	17	10	-14	10	-07
		arith	-33*	-17	38*	29	-05	-01	-34*	-21	-08	-10	21	-28	-13	22	16	04	-12	04	20	-02	13	-20
		lang	-23	-05	25	29	-03	-07	13	-17	04	-08	27	-02	14	16	-26	22	02	13	11	-13	15	-08
		total	-25	-16	3	33*	00	-08	-07	-27	-02	-05	31*	-21	07	21	-03	06	-08	12	16	-10	14	-14
	1/6	read	13	-15	07	30	05	-12	21	-51*	13	-07	36	-09	52	10	-37	-14	20	27	-08	-06	-07	04
		arith	-02	-17	14	28	-09	00	-03	-32	-05	-01	13	-24	52	27	-38	-16	00	27	-02	-03	16	-08
		lang	08	09	13	21	06	-07	37	-34	25	00	10	10	42	00	-54*	-10	-08	00	-08	-12	-06	20
		total	07	-09	12	29	01	-07	19	-42	12	-02	23	-09	52	13	-46	-14	05	19	-06	-07	01	05
	2/2	read	02	-08	15	33	19	12	18	-38	08	17	32	-12	46	09	-42	07	13	24	-01	-08	17	08
		arith	-11	-13	27	32	18	12	17	-24	-04	07	22	-19	48	16	-43	-06	20	27	-20	-15	18	-10
		lang	05	-05	10	30	14	09	18	-38	12	25	38	-11	34	13	-38	14	16	22	03	-14	15	16
		total	-04	-11	22	34	18	12	18	-33	02	14	30	-17	47	14	-44	02	18	26	-10	-14	18	00

* Significant at the .05 level.

Table 4-34

Correlation of California Achievement Test with Home Background Variables

Control Group

		DEMOG												CHES						INVENTORY			
		Mother Age	No. Children	Mother Educ	C.D.	Father Age	Father Educ	Child's C.A.	No. Younger Sibs	No. Older Sibs	Father in home	Welfare	No. Sibs	Avail & Use	Educ Expec	Mat Provided	Educ Concern	Educ Efforts	Total	FEY I	FEY II	SEY I	SEY II
California Achievement Test																							
	read	04	-03	47*	36*	00	10	-05	-19	03	05	13	-04	45*	03	30	06	18	39*	22	27	41*	-31
S1C	arith	06	10	41*	32*	-07	-07	-28	-13	14	09	25	10	37*	26	38*	-08	13	42*	12	10	43*	-37*
	lang	01	-09	41*	40*	-07	-18	-09	-17	-01	-02	03	-03	21	19	23	02	-11	24	20	29*	45*	-27
	total	05	01	50*	42*	-06	-05	-19	-19	08	06	19	02	40*	20	36*	-01	09	42*	20	24	51*	-38*
	read	16	04	59*	30	14	18	-15	-14	11	08	17	-07	-11	11	-06	-07	31	-04	22	34	54*	-01
S2C	arith	-17	-28	69*	46*	-12	00	-29	-22	-20	-11	11	-41	-29	27	-12	06	10	07	18	32	59*	-55*
	lang	11	-04	54*	34	03	02	-06	-34	09	-14	-23	-12	-35	13	-30	01	10	-10	-04	32	62*	-11
	total	00	-13	69*	43*	00	07	-21	-25	-03	-06	05	-27	-37	21	-16	01	18	00	15	37	65*	-30
	read	-36	-45*	49*	54*	-12	38	-06	-08	-38	-40*	-06	-41*	04	24	00	-07	15	19	29	53*	49*	-12
S3C	arith	-13	-26	65*	46*	08	15	-28	-13	-17	-27	20	-28	-06	15	-04	-08	16	08	31	40	69*	-38
	lang	-22	-31	61*	47*	-19	19	-16	-07	-26	-32	-06	-35	-17	22	02	09	48	27	08	48*	51*	-17
	total	-21	-33	64*	51*	00	22	-22	-12	-25	-32	10	-34	-06	20	-01	-0[illegible]	23	15	28	47*	65*	-30

* Significant at the .05 level.

Table 4-35

Intercorrelation of Home Background Variables

Experimental Group

		DEMOG												CHES						INVENTORY			
		Mother Age	No. Children	Mother Educ	C.D.	Father Age	Father Educ	Child's C.A.	No. Younger sibs	No. Older sibs	Father in home	Welfare	No. Sibs	Avail & Use	Educ Expec	Mat Provided	Educ Concern	Educ Efforts	Total	FEY I	FEY II	SEY I	SEY II
DEMOG	Mother's Age																						
	No. Children	35*																					
	Mother Educ	-26*	-29*																				
	C.D.	-23	-29*	72*																			
	Father Age	45*	22	28	-12																		
	Father Educ	-38*	-11	30	65*	-44*																	
	Child's C.A.	22	12	09	07	22	01																
	No. younger sibs	-29*	29*	03	04	-26	22	17															
	No. older sibs	54*	90*	-33*	-31*	31	-23	09	-12														
	Father in home	05	10	-14	-06	13	13	03	17	02													
	Welfare	00	-07	11	20	-16	28	-05	00	-07	63*												
	No. sibs	40*	99*	-32*	-31*	22	-13	17	21	90*	01	-14											
CHES	Avail & Use	24	22	19	11	39	19	38*	-22	33*	29	14	28										
	Educ Expec	07	-19	32*	35*	-10	21	05	-01	-19	19	45*	-22	24									
	Mat. Provided	-08	00	31*	-17	33	-02	-19	-10	04	-09	08	-10	27	11								
	Educ Concern	-22	-05	30	24	-01	00	-09	24	-16	-04	08	-02	06	29	00							
	Educ Efforts	08	-36*	09	35*	07	14	15	-02	-37*	05	35*	-39*	02	19	-21	06						
	Total	10	-05	43*	28	29	22	19	-10	00	27	39*	-05	73*	70*	38*	44*	28					
INVEN-TORY	FEY I	-16	-06	25	15	15	-08	-27*	12	-11	-09	-11	-13	-03	15	11	29	-08	13				
	FEY II	-07	-06	-11	13	-21	06	-16	20	-14	-09	-03	-08	-22	-14	-33	-02	21	-23	-16			
	SEY I	-09	-04	29*	26	13	10	-04	10	-14	05	-03	-11	10	09	-14	39*	08	17	56*	-29*		
	SEY II	07	17	-03	12	-25	31	23	11	12	20	00	19	-11	-12	-10	-06	02	-16	-32*	01	-33*	

* Significant at the .05 level.

Table 4-36

Intercorrelation of Home Background Variables

Control Group

		DEMOG												CHES						INVENTORY			
		Father Age	No. Children	Mother Educ	C.D.	Father Age	Father Educ	Child's C.A.	No. Younger Sibs	No. Older Sibs	Father in home	Welfare	No. Sibs	Avail & Use	Educ Expec	Mat Provided	Educ Concern	Educ Efforts	Total	FEY I	FEY II	SEY I	SEY II
DEMOG	Mother's Age																						
	No. Children	58*																					
	Mother's Educ	-18	-08																				
	C.D.	-28*	-34*	71*																			
	Father Age	85*	46*	-51*	-62*																		
	Father Educ	-20	00	04	08	-23																	
	Child's C.A.	-01	00	-10	-08	-11	33*																
	No. younger sibs	-18	13	13	01	-38*	15	17															
	No. older sibs	63*	94*	-12	-32*	57*	-05	-06	-19														
	Father in Home	47*	38*	-04	-20	37*	00	02	28*	27*													
	Welfare	26*	04	31*	12	06	11	-22	13	00	47*												
	No. sibs	59*	99*	-07	-28*	42*	01	00	03	94*	27*	11											
CHES	Avail & Use	17	20	-01	-05	31	21	-09	-35*	32	19	06	21										
	Educ Expec	02	-13	18	42*	-59*	16	-32*	00	-14	14	26	-07	-01									
	Mat. Provided	-05	-15	-25	22	-40	14	10	02	-15	-06	20	-04	25	23								
	Educ Concern	-01	-08	11	27	-15	07	-07	27	-15	23	15	-10	-09	19	-08							
	Educ Efforts	-06	-09	24	13	-24	09	-16	07	-11	02	02	-18	05	19	29*	-02						
	Total	05	-07	27	43*	-41	30	-24	-04	-05	23	28*	-02	50*	69*	58*	34*	47*					
INVENTORY	FEY I	-03	04	21	19	19	-13	-11	10	01	16	16	06	36*	-09	17	20	-03	24				
	FEY II	-10	-25	25	31*	-36*	06	-02	-13	-20	-24	01	-26*	-21	38*	03	09	08	16	-44*			
	SEY I	-12	-16	46*	33*	04	-21	06	08	-17	04	08	-19	09	-14	29	27	07	19	64*	-06		
	SEY II	15	14	-32*	-24	03	12	01	11	10	01	-11	18	-22	08	-33	-39*	18	-27	-32*	11	-46*	

* Significant at the .05 level.

Table 4-37

Correlation of Cognitive Variables with Home Visit Variables

Experimental Group

		Entering Year Home Visits							Second Year Home Visits							
		No. Visits	Mean Length	Mother home no. times	Mother partic no. times	Mother partic minutes	Times other adults present	No. children present	No. Visits	Mean Length	Mother home no. times	Mother partic no. times	Mother partic minutes	Times other adults present	No. children present	Home Visit Rating*
S-B	FEY	05	14	14	18	19	36	-08	00	47	-12	-43	-58	07	-23	-14
	SEY	40	09	56*	52*	02	34	14	03	00	00	-06	-22	-17	-38	27
	S2Y	32	-13	39	42*	22	32	04	19	-07	32	40	42	-31	-26	45
	SKG	14	—	22	11	-14	21	14	-51	57	-23	-24	-47	-50	-41	07
	S1G	—	—	—	—	—	—	—	-40	—	-07	-09	-35	-57	-51	12
Leiter	FEY	13	44	38	31	11	06	21	-11	14	-16	-12	07	-19	-05	19
	SEY	29	21	51*	47*	02	03	10	00	38	05	28	30	-17	-25	25
	S2Y	01	01	19	20	06	-02	-06	-08	-01	-01	15	29	-46*	-29	03
	SKG	-16	—	-12	-09	-23	03	-25	-22	55	00	09	-26	-05	-29	25
	S1G	—	—	—	—	—	—	—	-17	—	-02	26	-14	-26	-50	-32
PPVT	FEY	-12	-45	-21	-24	-49	-10	-06	-03	23	19	04	07	10	-18	18
	SEY	48	-20	47*	40	-19	20	-10	34	15	21	14	36	-29	-44	07
	S2Y	42*	-36	47*	55*	14	00	04	21	17	16	16	30	-23	-34	27
	SKG	-13	—	08	-02	-16	-07	-17	-58*	-26	-14	-13	-68*	-30	-75*	06
	S1G	—	—	—	—	—	—	—	-60*	—	-36	-47	-57	-26	-48	-11
ITPA	FEY	02	36	02	02	-17	00	07	-19	-07	-12	-01	17	-15	-31	-02
	S2Y	05	46	21	13	-28	07	11	01	-28	02	02	21	-35	-25	23
	SKG	20	—	21	10	-10	20	07	-02	39	-02	-32	02	-21	-20	-20
	S1G	—	—	—	—	—	—	—	02	—	27	58	01	-23	-51	56

*Significant at the .05 level.

into experimental and control subgroups, few high correlations would be expected. The fact that many moderate-to-high correlations appeared in spite of the existing homogeneity suggests that there was considerable individual variance even within such restricted groups. A broader sample of disadvantaged youth could be expected to amplify the size of the correlations substantially for many of the variables.

In contrast to the typical moderate-to-low magnitudes of most correlations, several blocks could be assigned to the high category, such as the Stanford-Binet by Stanford-Binet, the Stanford-Binet by California Achievement Tests, The Leiter by California Achievement Tests, the California Achievement Tests by YRS Academic Potential ratings, and the California Achievement Tests by the PBI Academic Motivation ratings. These empirically obtained correlations documented the a priori expectations that certain cognitive scores, achievement scores, and academic ratings would tend to be highly interrelated. Predictably, most of the same relationships emerged from the regression analyses of the previous section but with much more precision, demonstrating the advantage of using multivariate techniques. Relationships of the YRS and PBI with achievement did not appear in the regression results, of course, because they were not used in that analysis.

Several of the blocks of correlations were conspicuously low enough to be singled out: the PPVT by YRS and PBI ratings; the ITPA by YRS and PBI ratings; the cognitive variables by demographic variables, by CHES totals, and by Inventory factors; and the California Achievement Test by demographic variables (except for mother education and cultural deprivation ratings) and by CHES totals.

Most correlations were positive, but again there were several conspicuous exceptions: the PPVT by PBI Classroom Conduct ratings; the cognitive variables by demographic variables (except for mother education, cultural deprivation ratings, and welfare) and by Inventory factors; and the California Achievement Tests by demographic variables (except for mother education and cultural deprivation ratings).

Summary of Results

The results of analysis suggest that the preschool has had positive effects in each of the three categories of dependent variables, discussed separately in this section:

1. Preschool improved the level of children's cognitive functioning for a moderately long period of time;

2. Preschool improved the long-term achievement scores for experimental children, especially for girls;

3. Preschool improved the long-term emotional adjustment and social development ratings of the experimental children.

Cognitive effects of preschool. The experimental group was significantly superior to the control group on each of the four cognitive measures both years of preschool. Such overwhelmingly consistent differences leave no room for doubt that the preschool had an important immediate impact on the cognitive functioning of the experimental children. Two years after the end of preschool, differences between the experimental and control children decreased considerably although they still remained large enough to maintain significance on the Stanford-Binet and the Peabody Picture Vocabulary Test. Thus it can be said that the cognitive effects of preschool lasted moderately long before finally disappearing.

In terms of predictive ability, knowing which children went to preschool permitted better prediction of cognitive performance (Stanford-Binet scores) during the two years of preschool than did knowing children's status on any of the other independent variables. Children's entering cognitive performance closely followed preschool attendance in predictive importance until children entered kindergarten, when it replaced preschool attendance as the most important predictor.

Achievement effects of preschool. The experimental group was significantly superior to the control group on the California Achievement Tests in each of the first, second, and third grades, revealing long-term differences on the most important dependent variable. This finding must be qualified by the significant *post hoc* comparisons of the ex-

perimental girls to the rest of the children, however. This suggests that although the preschool appeared to be very effective for girls, for some as yet unknown reason it was less effective for boys.

In spite of the statistical importance of later achievement differences attributable to preschool, regression analysis results show other independent variables to be consistently better predictors of achievement. For example home background factors, as reflected by mother's education, the Cognitive Home Environment Scale, and the Inventory of Attitudes on Family LIfe and Children, accounted for an important amount of variance in the achievement scores for each of the three grades. In addition, entering cognitive performance as assessed by the Stanford-Binet and Leiter correlated moderately high with achievement scores, and accounted for more of the achievement variance than preschool attendance in each of the three grades. Thus, even though important, the effects of preschool on later achievement were smaller than the effects attributable to certain aspects of home environment, and smaller than the effects attributable to entering cognitive performance.

Socio-emotional effects of preschool. The Socio-Emotional State, Social Development, and Emotional Adjustment factors on the two teacher rating scales show significant experimental group superiority in the first and second grades, but not in kindergarten or third grade. The similar kindergarten means seem to be due to delayed but emerging differences; the favorable but insignificant third grade differences might be strengthened by the addition of data from later waves. In all cases, scores on these three teacher rating factors correlated positively with achievement scores, often moderately high and over. This suggests that children who do well in school achievement also tend to be more socially developed and better emotionally adjusted.

Academic factor results on the rating scales largely parallel achievement results, showing the significant superiority of experimental children, especially experimental girls. This finding, coupled with consistently high correlations between the two academic rating factors and achievement scores, reveals that teachers perceive children's academic performance much the same as measured on standardized achievement tests.

CHAPTER V

Conclusion and Recommendations

This report is an overview of the partial results of the first phase of the Ypsilanti Perry Preschool Project. These data are incomplete, but the final collection of data for the first phase of this longitudinal project will be undertaken in spring, 1971. At that time, all waves will have completed two years of preschool and four years of public school, kindergarten through third grade. In looking at the information in this report and in interpreting these findings, unusual care must be taken to recognize that the size of the sample changes at each grade level, that the sample is representative only of black youngsters who are from small, northern, urban communities, who are from disadvantaged homes, and who are diagnosed as functionally retarded at age three. These data are only suggestive, then, about the total population of disadvantaged children, and, therefore, about all children. It is hoped, however, that these data can serve as reference information for those doing research in the field of preschool education.

This chapter treats a number of issues. First, it summarizes the main findings of the study. Then, some specific findings are presented because of the suggestive nature of the data for preschool compensatory education. Third, some of the reasons are outlined for the success of this project in realizing its goal of improved achievement in experimental children. The primary focus of this discussion is on the program components included in the project and the staff operations model. Fourth, some of the reasons others have advanced to explain improved cognitive functioning in disadvantaged children are reviewed, and there is a brief discussion of their relationship to this project. Finally, some major implications of the project for early childhood education are discussed.

Main findings of the study. The findings of the study, specific to the population from which the sample was drawn, support the value of preschool education. Results from each of the three major areas are as follows:

1. Cognitive effects. Children who participated in the preschool program experienced significant and immediate improvement in cognitive functioning as measured by such standardized tests as the Stanford-Binet, Leiter International Performance Scale, Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic Abilities. This significant improvement in functioning continued through three years of schooling. It disappeared at the point at which the control group children had improved sufficiently to offset the early advantage of the experimental children. That is, the control group gradually improved its performance while the experimental group, after rapid initial gain, gradually declined; thus, during second grade the significant cognitive differences disappeared. There were few sex differences on the tests except with the Peabody Test, on which the boys generally scored higher than the girls. In general, the scores on the Leiter, a non-verbal, concept reasoning test, tended to be 5 to 10 points below the Stanford-Binet. Scores on the Peabody Test, a vocabulary comprehensive test, tended to be 15 to 20 points below the Stanford-Binet.

2. Achievement effects. Children who participated in the preschool performed significantly better on the California Achievement Test in the first, second, and third grades than did the control group children. It is important to note that this advantage was derived primarily from the performance of experimental girls. Of all the areas measured in this project, the performance of the children on achievement tests was seen as the most important. The primary purpose in establishing the preschool was to prepare children to procure an education from the schools by gaining the necessary skills to operate in the classroom. The better performance of the experimental children on the standardized achievement test indicated that the goal had been reached.

3. Socio-emotional effects. Children who participated in the preschool program were rated as being better adjusted and showing more academic promise than control children. Significant ratings by teachers occurred only after the experimental children demonstrated better achievement performance than the control children in the first grade. It should be noted that while there is less evidence of improved performance on socio-emotional factors in the third grade, the trend is still present. At the time the Perry Project began, there was considerable concern on the part of nursery educators about the "pressures" a program as structured as the Cognitively Oriented Curriculum

would inflict upon the children. There were dire predictions of permanent emotional damage to the experimental children. According to the data collected during the project, teachers apparently feel that children experiencing the "pressure" of this preschool program are, in their view at least, better off for it, during the four years after preschool.

Specific findings of the study. In addition to the main findings of the study, some suggestive specific findings emerged. Further follow-up da' are necessary to clarify the exact status of these findings.

1. Achievement-adjustment-achievement cycle. Educators, especially nursery school educators, have long maintained that one of the first tasks of the school is to create a sense of security for the child. The British infant educators, for example, even have a name for the initial period, "settling in." Once the child feels secure (and this may take from a week to a year), he is ready to learn what is available in the school program.

The data from this project suggest that the actual situation may be that achievement and adjustment occur together. When the kindergarten teachers rated the control and experimental groups for general academic promise and social adjustment, they rated the experimental children slightly but not significantly higher than the control children on most factors. As reported in an earlier paper (Weikart, 1967) the Gates Achievement Tests (data not presented in this report) also did not discriminate between the experimental and control groups. Thus, at the kindergarten level, there were only minor differences in teacher adjustment ratings of experimental and control children and achievement results. However, by the end of first grade, the experimental children were significantly differentiated on achievement tests (California Achievement Test). At that point, the first grade teachers also gave significantly higher ratings to the experimental group on academic and social adjustment factors. Apparently teachers see children as adjusted either while the children are achieving or afterward. The data certainly support the position that preschools which directly help children to achieve, as this curriculum does, do not hinder, but rather help the child's adjustment.

2. Classroom behavior and achievement. It is often stated that girls achieve better than boys because girls are more passive and they comply more easily to the demands of teachers for good and conforming behavior. While there were no sex differences in the cognitive data, boys did not achieve as well as girls, and boys were rated less favorably than girls by teachers. The fact that teachers tend to favor girls may be the reason for the better achievement of the girls in this project.

Teachers do rate girls significantly higher than boys on the Classroom Conduct and Personal Behavior factors of the PBI. The experimental girls are rated somewhat higher than the control girls, and together they are significantly higher than boys of both groups. If higher achievement were only the product of good classroom conduct and personal behavior approved by the teacher, then the achievement of the experimental girls and the control girls should be rated approximately the same. This is not true, however. Also experimental boys achieved higher scores than the control girls during two of the test periods.

Other factors of the rating scales, such as Academic Potential and Social Development from the YRS, and Academic Motivation and Socio-emotional State from the PBI reflect the impact of preschool participation rather than consistent sex differences, because the control and experimental groups are rated as a group. It would seem that children are seen fairly accurately by their teachers in terms of achievement potential and general social adjustment. Simple good behavior and willingness to conform do not seem to substitute for actual academic achievement. Most importantly, teachers seem willing to accept this separation and credit children with their actual performance and behavior.

3. Manner of preschool effects. The purpose of the preschool was to provide sufficient educational compensation to the child to permit him to profit from a standard educational curriculum. Although an "innoculation" against further educational difficulties is hardly a burden preschool programming can assume, this effect, seems to have been achieved with some children. For example, in third grade, 5 of the 12 experimental children but none of the 15 control children are at or above 50% on the California Achievement Test. The conclusion

seems to be that preschool "frees" the child from the normally expected relationships with demographic variables that usually "determine" academic progress.

Perhaps the most dramatic example available in these data is from the regression analysis of achievement predictor variables. In the control group, achievement in the early elementary grades seems to be the product of (1) the sophistication of the mother, as represented by the amount of education she has received, and (2) the level of support she gives her child's intellectual and academic development, as measured by her general child rearing attitudes and by the verbal competency her youngster has developed at age three. (It is commonly assumed that parental attitudes and verbal skills of children relate to achievement.) In the experimental sample, however, the impact of the mother is greatly reduced, for the capacity of the child to profit from educational opportunities, as represented by the initial Stanford-Binet scores, is more important in predicting later achievement. Instead of the mother's status and attitudes determining the child's performance, the child's intellectual ability is foremost.

One of the effects of this preschool is that it enables disadvantaged families to help their children break loose from the cycle of habits and attitudes that continually tie their children to poor school achievement. This is accomplished through effective instruction of the child and direct involvement of the mother in the education of her child. While preschool did not raise all participating children to the same level of accomplishment, it did lessen the relationship of achievement in children to accidents of birth and social opportunity. In a home teaching project conducted by Weikart and Lambie (1968), this same reduction of the relationship of achievement to demographic variables was found. Since one of the goals of preschool is to compensate for the disadvantages that society has placed in the way of a child's development, this alteration in the relationship of independent variables to later elementary school performance is welcome.

A second example of the way preschool "frees" the child from usually expected relationships between achievement and demographic variables is found in the correlations of birth complications and achievement. As reported previously, girls in the experimental group obtained the best achievement records. It is not surprising, then, to

find that sex and achievement in the experimental group correlated moderately across all three followup years. In the control group, however, there was almost no correlation between sex and achievement. Birth complications correlate moderately with achievement across all three grade levels for the experimental group, and there is almost no correlation between birth complications and achievement in the control group. As would be expected there is a low and negative (-.21) correlation between birth complications and sex, with girls having fewer complications. The correlation for the control group is also low, but it is in the same direction as the other low correlations in achievement (+.19). This admittedly slender evidence suggests that one reason boys are not represented adequately in the achievement group is that they have basic physical complications which handicap their reaction to the complex task of school achievement. The relationship of birth complications to school achievement was explored by Pasamanick and Knoblock (1961), and they reached the same conclusions. They reported in a later study that the relationship drops as the child gets older. Data to support that finding will not be available from this project for several more years.

These two examples suggest that because the experimental children participated in the preschool program, they were able to "go ahead" and perform at the level of their ability. Preschool acted as a "release" for them. Without preschool they would probably have achieved at the same level as the control group children.

It seems that preschool may be a very essential experience in enabling specific children to "break away" and become independent of traditional determiners of school success. Two conditions are suggested which may limit this capacity to break away even if the child has access to quality preschool programming: (1) birth complications may create physical conditions preventing adequate attendance, information processing, and other intellectual habits and skills necessary for learning to occur normally, and (2) low initial ability at three years of age. The strong relationship between the FEY Stanford-Binet and the achievement test scores for the experimental group as compared with the control in the three follow-up years supports this contention, as does the increasing strength of correlations of FEY Stanford-Binet scores with later Stanford-Binet scores. More data are necessary, however, to clarify these findings.

Why this project has been successful.

Whether or not this preschool project will be successful in reaching its long-term goals of improved academic achievement for the participating children cannot be answered without further data. At the present time, a number of factors can be listed as essential to its success so far.

1. Curriculum. The curriculum employed in the Perry Project was derived primarily from the child development theories of Piaget. While the ideas of other theorists such as Smilansky were utilized for specific portions of the curriculum, the organizing concepts were drawn from Piaget. The use of a theory-based curriculum permitted commitment to a specific framework which set limits for classroom operation and provided a challenge to teachers to select appropriate activities, to match their program with desired outcomes, and to direct the total classroom operation toward support of the theoretical goals. The necessity for the staff to work within a framework was important to the success of the project primarily because of the discipline and focus it provided, and because of the ongoing opportunity for open staff discussions about both theory and practice. A theoretically based curriculum brings all staff together as a team attempting to solve a complex problem rather than separating them into one group with information and another group without information.

2. Planning. All teachers had to prepare lesson plans based upon the specific goals of the curriculum at least a week before they were to be used. In order to do this, the teachers had to understand the theoretical basis of the curriculum and how to adapt it to the individual child. Planning forced specific attention to the use of time in the classroom and the particular goals of classroom activity. Planning provided an opportunity for a constant review of curriculum effectiveness. Also, it was the most difficult thing for the teaching staff to do because of the amount of time and energy required for adequate planning.

3. Team teaching. The four teachers taught as a single team for all but the last year of the project; at that time, two groups of two teachers each were organized. The teachers taught during the entire time they were in the classroom, avoiding serial teaching. It took a constant effort to develop activities and to solve problems within the theoretical framework of the model that reflected the best thinking of the team.

4. Commitment. In order to meet the expectations of the project by fulfilling the requests of the research staff and by being effective in the classroom, the teachers had to spend time over and above regular teaching time to stay ahead of the demands. Lunch hours, after school, and "break times" were often employed to prepare lessons, write reports, and meet with various staff members and visitors. This type of involvement came from a firm commitment to the program. It meant that the program operated in each classroom was a direct expression of the individual teacher's work, rather than something routinely applied.

5. Supervision. The teaching team was supervised by an experienced teacher who was familiar with preschool classrooms and a member of the research staff who was familiar with the theory. The focus of the supervision was on providing clear orientation to the project goals and on "refereeing" problems of operation within the team. Rather than simply smoothing over problems, the supervisory staff worked with the teachers to help them face the issues and to reach solutions which were within the theoretical framework of the curriculum model. The supervisory staff also provided inservice training for the teachers. Although the supervisory staff was not authoritarian in operation, it was clearly responsible for helping the teachers keep to the instructional problems at hand.

6. Respect for the individual. The project was operated as a group of professionals working to produce information. While this group operation ideal often broke down, the project attempted to keep all staff members in communication. This interaction gave each staff member an actual part in the development of the total project.

7. Involvement of the mother. The classroom teachers made home teaching visits to all of the children participating in the project. These visits were designed to actively involve the mother in the process of education. While group meetings were held about once a month and some preschool observations were scheduled, the primary focus with parents was the educational activities in the home. The mothers responded well to these visits and increased their attention to this aspect of the program during the period they received visits. The home visits provided powerful supportive action for the child.

8. Focus on the child. In order to prepare for the weekly 90-minute home teaching sessions, the teacher directed her attention to the particular problems of the child she had seen on past visits and in the classroom. Upon returning from the home visit, the teacher wrote a report on her observations. The home teaching sessions, therefore, provided an unusual opportunity for the teacher to focus upon the learning problems of each child. This knowledge was carried over into the classroom instructional program.

9. Focus on education. The project did not have professional staff other than teachers and research personnel. It did not offer social work services, health services, referrals to clinics or agencies, or other supplementary services. The teachers and the project families saw the teacher's role as clearly educational in nature. This single-purpose approach is practical in southeastern Michigan because the services of the many agencies are readily available.

10. Language. The heavy use of language in the classroom with the students and on home visits with the mothers and children was essential to the operation of the project. While the method of teaching language varied greatly throughout the project, the requirement that the teacher maintain a constant verbal communication pattern with each child, even when he would not respond, was an important characteristic of the project.

11. Operation of a model program. In the operation of a research model program, the expectation of the staff is high. The constant stream of visitors and consultants and the high rate of outside criticism creates an artificial situation. What was done, how well it was done, and how it might have been done better are constant questions that the staff of a research project learns to live with, and they help keep the quality of performance high. Any interpretation of the results of the Perry Project must take into account the pressure inherent in a research project for quality performance by all personnel.

In summary, the Perry Project was successful for three basic reasons. First, the project included extensive opportunity for each teacher to think about the children she was serving. Home teaching, small classes with a reasonable number of children, report writing, and constant discussions of how to help a specific child grasp

a concept were among the many things that resulted in teacher-child interaction. The result of these extensive experiences with each child is that teachers will treat the educational development of a young child effectively if they can evolve an intimate knowledge of how a specific child learns and responds through direct experience with that child.

Second, the project provided a meaningful way for mothers to be included in the educative process. The importance of the mother in educational attainment is well known. Bringing the teacher into direct and weekly contact with the mother provided the opportunity for extensive development of supportive educational skills on the part of the mother. While the data show that the preschool mothers alter their actual teaching behavior to resemble mothers who teach their children successfully (Weikart and Wiegerink, 1968), the home teaching process is not as much a transfer of information or experience to the mother as the creation of an atmosphere of support for intellectual growth in the home.

Third, the project operated in such a way that each staff member was creatively involved in the total operation. The adoption of a theoretical framework does not diminish the opportunity for participation on the part of staff. While the degree of involvement varied from year to year, the more staff were able to make the project an expression of their own efforts, the more effective the program became.

Alternative explanations of project success. Actually, little is known about the longitudinal impact of preschool programs for the disadvantaged child. Most of the projects which have reported information are in the early stages of follow-up efforts. Gray and Klaus (1969) report that scores on cognitive measures decline for both the experimental and control groups, but there are significant differences still present in third grade. Achievement differences had disappeared by this point, however. Beller (1969), studying a modified preschool follow-up project (control groups were added as the nursery children attended regular school), found significant differences in both cognitive measures and achievement through third grade. Because of the lack of achievement data, most explanations about preschool results have focused on cognitive measures. When improved IQ scores are obtained, the basic question is whether or not these gains represent actual improvement in the cognitive functioning of the child.

In the Perry Project, the gains are viewed as a fundamental shift in the functional level of the participating children. This shift was made possible by the alteration of the level of support offered by the environment through participation in the preschool and through involvement of the mother in home visits.

Among the alternative explanations, one of the most common is that the gains result from "doing something different" with the children. This position is derived from the famous Westinghouse Hawthorne plant study in which any change in the production line organization and working conditions of the women employees resulted in improved output. A second, closely related explanation is the "Pygmalion" or Rosenthal effect (Rosenthal and Jacobson, 1968), which suggests that teacher expectations influence pupil performance. This implies that preschools obtain gains because they alter the environment for the child by increasing teacher (and parent) expectations. (The data establishing this position have been severely criticized by Thorndike, 1968, and Snow, 1969.)

The relationship of these two viewpoints to preschool outcomes seems minimal, however, primarily because of the failure of many preschool programs to produce a shift in measured cognitive functioning even though they have reported that they have "done something" and altered expectations. Perhaps the best example is from the first year of the preschool project studied by Di Lorenzo (1968) in New York State. In this project, the experimental children did significantly better in statistical terms than the control children, but only because the control children lost more in measured IQ than the experimental group lost. In the Curtis and Berzonsky (1967) project in Pennsylvania, the few significant differences obtained were in favor of the control group children. These two projects were massive, multi-city, multi-group studies, hardly open to criticism of poor research methodology or small sample sizes, as was the study reported by Alpern (1966) which obtained similar results. It seems, then, that the Hawthorne and Pygmalion effects have little demonstrated relevance to the effects of preschool education. It is implausible to maintain that successful preschools result only from "altered expectations" or "doing something" when there are so many preschools in which these conditions are said to prevail but no changes occur.

A third explanation for preschool IQ gains interprets the results as changes in motivation and test-taking orientation rather than as an alteration in basic cognitive functioning. A careful study by Zigler and Butterfield (1968) illustrates this point. They reported gains of about six points on the Stanford-Binet IQ test in a preschool program designed to maximize the general social-emotional adjustment to the school situation. They also found that good supportive testing by sympathetic examiners could accomplish approximately the same amount of change. Their conclusion was that IQ gains in children from disadvantaged backgrounds represented an increase in the ability required to take tests, to respond to adults, to focus on required tasks, and to know what the examiner thinks is important, rather than changes in the actual rate of intellectual development. Most researchers in the field accept Zigler's and Butterfield's explanation for the first six points of increase (Horowitz and Paden, 1970; Washington et al., 1969; Weikart, 1967). However, it does not explain why some carefully run preschool projects find consistent gains of as much as 25 to 30 Stanford-Binet points (Smilansky, 1966; Weikart, 1969). Apparently there are real increases in cognitive functioning beyond those obtained by increased familiarity with testing or improved motivation.

A fourth explanation frequently offered for IQ increases is that preschool programs teach for the test. Outspoken proponents of this position (Washington, Engelmann, and Bereiter, 1969) initiated a program to teach the Stanford-Binet as a form of achievement test. The research staff and the teachers designed the curriculum to reflect the nature of the Stanford-Binet test, using comparable items. The results were very clear. The "Binet curriculum" was no more successful in training for the Stanford-Binet than the Bereiter-Engelmann academically oriented preschool program, which teaches basic skills. Both programs obtained an IQ increase of 13 points, and both obtained a similar increase on individually administered Wechsler Intelligence Tests. They concluded that "If the present study has accomplished nothing else, it should at least help to silence those inevitable critics who sneer 'teaching for the test' everytime they hear a report of substantial IQ gains." Apparently about six points in IQ gains result from improved motivation, test-taking abilities, and ability to focus, as Zigler and Butterfield maintain, while the remaining gains reflect an accelerated learning of basic skills. More longitudinal data from the wide range of current projects is necessary for a final conclusion.

Implications of the Project

The results of the Perry Project raise a number of implications for compensatory education of disadvantaged children. Those that will be discussed here include: 1) the need for improved prenatal care, 2) the need for infant education, 3) the need for continued preschool programming, 4) the need for curriculum development specifically related to boys, and 5) the need for continued programming into the elementary grades.

1. Improved prenatal care. The need for women to receive adequate prenatal care during pregnancy is widely known. Various agencies provide services to families who cannot afford private treatment. In spite of the widely available services in this area of southeastern Michigan, at least 20% of the project sample had no medical services until the baby was born. (Another 44% had no record of service.) This suggests a strong need for agencies to make their services more directly available to families who need them so that expectant mothers will receive prenatal care. In spite of a lack of information which would result in a conservative statement of the data, indicators of birth complications held a moderate correlation with achievement in grades one, two, and three. Improved medical care would do much to prevent birth complications and would probably improve the child's chance of profiting from educational opportunity.

2. Infant education. One of the strongest predictors of later school achievement was the FEY Stanford-Binet obtained at age three. Thus, a second way of improving the disadvantaged child's chances of profiting from educational opportunity would be to develop his ability as much as possible before the age of three. Home teaching done by Schaefer (1969), Gordon (1969), and Weikart and Lambie (1969) suggests ways in which such an education program might be undertaken. The current emphasis on day care may be useful in aiding children if it does not exclude the mother from creating adequate intellectual support systems through her relationship with her child.

3. Preschool programming. While the follow-up data of the project are not complete at this time, preschool programming as represented in this project is essential if disadvantaged children are to achieve in regular public school classrooms. Some, but not all, of

those who participated in this preschool became able to operate in regular educational programs as normal achievers. Most, but not all, of the control group without preschool training were unable to profit from regular education. In general, it seems that children from the groups served by this project do not succeed without preschool assistance. At this time, preschool attendance is an effective method of compensating for the deficits these children bring to the educational process.

4. Curriculum to assist boys. The boys who participated in the project were less responsive to the program. There are many reasons for this, such as the higher incidence of birth complications and different socialization practices. However, further investigation should be made to discover what steps may be taken to correct the situation. A number of investigators are concerned with the problem boys have in developing adequate sex identification in the school situation. Van den Daele (1969) has designed a program specifically to help boys establish adequate sex identification. Many preschools are including male teachers and para-professionals whenever possible. Further adjustment in curricula must be made for boys, and specific attention must be given to this problem.

5. Continued programming. Although some of the children who have participated in preschool are able to achieve in the elementary grades, not all of them are successful. The downward drift in measured cognitive ability as the preschool experimental group progressed through school signals the reduction in environmental support available to the child. Preschool has simply established the potential for later achievement, and elementary school curricula will have to be modified so that this potential may be realized. The national Follow Through program is one current effort in this direction, thought the program is too new to report any long-term results.

There have been many myths created over the years about education in general and preschool education in particular. Apparently children are very much the creatures of their environment, i.e. the environment society has provided. Instead of retreating to explanations of functioning in terms of genetic ability, learning styles, learning disabilities, or any of the other jargon used in discussing children in the early 1960's, current successful programs for the education of young children must be given a chance. The question is no longer whether children can profit from a quality preschool experience, but whether we will provide it.

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APPENDIX A

PART I: METHOD OF COMPUTATION OF CULTURAL DEPRIVATION SCALE SCORES

The index of cultural deprivation (C.D.) includes the following three components:

1. The father's occupation on a 4-point scale (or the mother's occupation if no father is in the home).

   1 point - unskilled or unemployed
   2 points - semiskilled
   3 points - skilled
   4 points - professional

2. Number of years of education completed by the parents (an average of the two, or the mother's education only if no father is in the home).

3. Density in the home is defined as the number of rooms divided by the number of people living in the home.

   In the number of rooms are included the kitchen and the bathroom. A shared bathroom is counted as half a room.

Occupation and education are given a full weight, but density is given a 1/2 weight. Each component is divided by its standard deviation to equate the variability of all components. In other words, the C.D. rating is the sum of three z scores, except that density is given a 1/2 weight.

The above gives a definitional formula. In actuality, the following computation formula is used:

$$\frac{1}{2}(\text{Education}) + 2(\text{Occupation}) + 2\left(\frac{\text{Rooms}}{\text{People}}\right)$$

Reflected in the computational formula are the following approximate standard deviations from the original Perry School population: 2 for education, 1/2 for occupation, and 1/4 for density.

An example from an actual case may best clarify the computational formula. If pertinent data are

Father's occupation: Unskilled factory work (1 point)
Mother's education: 11 years
Father's education: 7 years
) Average = 9
Number of rooms: 6
Number of people living in home: 9

$$\text{C.D.} = 1/2\ (9) + 2(1) + 2\left(\frac{6}{9}\right) = 7.8$$

APPENDIX A

PART II: QUESTIONNAIRE FOR COMPUTATION OF CULTURAL DEPRIVATION SCALE SCORES

Ypsilanti Perry Preschool Project Sample Screening Form

Mother's Full Name _____ Teacher Completing Form _____

Address _____ Date Form Completed _____

Phone _____

1. Names and Birthdates of Children not yet in kindergarten:

Name (first) (last)	Birthdate	Name (first) (last)	Birthdate
List 3 year olds on Line 1			
1. _____		2. _____	
		3. _____	
(city) (hospital) (county) (state)		4. _____	

2. Mother's Birthdate _____

3. Highest grade at which the mother stopped school -- Circle One

Elementary								High School				College				Post-Graduate			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

4. Is the mother current employed? Yes_____ No_____

What is her job called? (example: waitress, teacher, etc.) _____

What does she do on the job? (example: waits on table in small luncheonette, day work, etc.)

_____

Is this full time?_____ Part Time?_____ Odd Job?_____ Other?_____

Names of others currently living in the house other than preschooler and mother.

Name	Age	Relationship to Preschooler	Name	Age	Relationship to Preschooler
1.			5.		
2.			6.		
3.			7.		
4.			8.		

REGARDING PRESCHOOLER WHOSE BIRTHDAY FALLS BETWEEN 12/2/__ and 12/1/__

A FATHER

1. Father's name _____

2. Highest grade at which father stopped school -- Circle one

Elementary								High School			
1	2	3	4	5	6	7	8	9	10	11	12

College				Post-Graduate			
13	14	15	16	17	18	19	20

3. Is the father currently employed? Yes___ No___

What is his job called? _____
(example: short order cook, truck driver)
What does he do on the job? (example)
assembly line, janitor, etc) _____
_____
_____

Is it full time? ☐ Odd Job? ☐
Part time? ☐ Other? ☐

4. If father is not in home how long has he been absent? _____

B. Stepfather or Male Guardian None ☐

1. Stepfather's name _____

2. Highest grade at which the stepfather (male guardian) stopped school -- Circle one

Elementary								High School			
1	2	3	4	5	6	7	8	9	10	11	12

College				Post-Graduate			
13	14	15	16	17	18	19	20

3. Is the stepfather (male guardian) currently employed? Yes___ No___
What is his job called? _____
(example: short order cook, truck driver)
What does he do on the job? (example)
assembly line, janitor, etc) _____
_____
_____

Is it full time? ☐ Odd Job? ☐
part time? ☐ Other? ☐

4. How long has he lived in the home? _____
_____

Are you getting help financially from any other sources other than wages and salary? Yes ___ No___
If yes, indicate by a check

☐ ADC ☐ WELFARE ☐ OTHER

How many rooms do you have, including bathroom? _____

Kitchen Yes___ No___ Dining Room Yes___ No___ Living Room Yes___ No___

No of Bedrooms _____ Bathroom Yes___ No___ Shared___ Recreation Room Yes___ No___

Others (list)_____

As far as you know, do you plan to remain in Ypsilanti for the next two years? Yes___
No___
Uncertain ___

APPENDIX B

Ypsilanti Perry Preschool Project
Demographic Questionnaire

Name _____ Sex _____ Birth Date _____

Address _____ Telephone _____

Place of Birth _____ Church Preference _____

With whom does the child reside? _____

Parents	Birth Date	Birth Place (City & State)	Occupation	Remarks (Education, address if different, etc)
F				
M				
SF				
SM				

Children: List in descending order from the oldest; check subject

	Age	School	Grade	Remarks (Address if different)

Relatives Living Elsewhere:

_____

_____

_____

1. List any persons living in the home in addition to the mother, father, and siblings.

_____

_____

2. Where did the mother go to school (what part of the country)?

_____

3. Do you have any magazines in your home regularly? Yes___ No___

4. Do you own a dictionary? Yes___ No___

5. Have you ever visited Detroit or Ann Arbor museums with your family? Yes___ No___

6. Are you or anyone in your family a member of the public library?

Yes___ No___

7. Have you visited the zoo in Detroit with your children? Yes___ No___

8. Does anyone living in the home have a major physical problem, such as bone or joint trouble, difficulty in hearing, etc?

Yes___ No___

Explain_____

_____

9. Do you belong to any organization(s)? Yes___ No___

If yes, what one(s)? _____

_____

10. Does your child belong to any organization(s)? Yes___ No___

If yes, what one(s)? _____

_____

Appendix C

ITEMS* on the INVENTORY OF ATTITUDES
ON FAMILY LIFE AND CHILDREN

Class-sensitive Items

1. Children should be more considerate of their mothers since their mothers suffer so much for them.

2. Sex is one of the greatest problems to be contended with in all children.

3. Children pester you with all their little upsets if you aren't careful from the first.

4. Children should never learn things outside the home which make them doubt their parent's ideas.

5. The sooner a child learns to walk the better he's trained.

6. A mother should do her best to avoid any disappointment to her child.

7. Parents should know better than to allow their children to be exposed to difficult situations.

8. A good mother will find enough social life within the family.

9. Mothers sacrifice almost all their own fun for their children.

10. The trouble with giving attention to children's problems is they usually just make up a lot of stories to keep you interested.

11. Most children are toilet trained by 15 months of age.

12. A mother has a right to know everything going on in her child's life because her child is part of her.

13. Few men realize that a mother needs some fun in life too.

14. A child soon learns that there is no greater wisdom than that of his parents.

Items with which the lower class mothers disagreed most frequently

15. A child who is "on the go" all the time will most likely be happy.

16. Some children are just so bad they must be taught to fear adults for their own good.

17. Mothers very often feel they can't stand their own children a moment longer.

18. There is usually something wrong with a child who asks a lot of questions about sex.

19. One of the worst things about taking care of a home is a woman feels that she can't get out.

20. There is no good excuse for a child hitting another child.

21. Having to be with the children all the time gives a woman the feeling that her wings have been clipped.

22. The child should not question the thinking of his parents.

23. A child should be taught to avoid fighting no matter what happens.

24. A mother should make it her business to know everything her children are thinking.

Items not sensitive to class differences

25. Children will get on any woman's nerves if she has to be with them all day.

26. Children would be happier and better behaved if parents would show an interest in their affairs.

27. Parents must earn the respect of their children by the way they act.

28. Children who are held to firm rules grow up to be the best adults.

29. A child's ideas should be considered seriously in making family decisions.

30. Parents who are interested in hearing about their children's parties, dates, and fun help them grow up right.

31. When you do things together, children feel close to you and can talk easier.

32. When a child is in trouble he ought to know he won't be punished for talking about it with his parents.

* The Inventory of Attitudes on Family Life and Children (based on the Parental Attitude Research Instrument by E.S. Schaefer and R. Q. Bell) went through many revisions. The set of items listed here appeared on all versions of the instrument. Respondents used a four-point scale: strongly agree, agree, disagree, strongly disagree.

APPENDIX D

PART I: COGNITIVE HOME ENVIRONMENT SCALE*
FORM R

YPSILANTI PUBLIC SCHOOLS
Ypsilanti, Michigan

Mother _____

Child _____

Interviewer_____

Date_____.

Instructions for Interviewers:

a. Explain that you are from the Ypsilanti Public Schools and that the school is conducting this study to find out more about how children learn. Since children spend far more time at home than at school, it is important to get a better idea of the things they do outside of school. All information which is collected will be kept confidential. Urge the respondent not to reply to any question she feels is too personal.

b. Use the child's name in each question where a blank is inserted.

c. When additional space is needed for recording the reply, use the reverse side of the paper indicating the number of the question and the sub-section being recorded.

d. In recording answers, be as specific as possible.

---

* Based on the Environmental Process Scale by Richard Wolf. (Wolf, R. M. The identification and measurement of environmental process variables related to intelligence. Unpublished doctoral dissertation. University of Chicago, 1964)

_____ 1. (When _____ starts to school.) What grade do you expect _____ to receive in most subjects?

(Circle one) A B+ B C+ C D+ F

_____ 2. What grade would satisfy you?

(Circle one) A B+ B C+ C D+ F

_____ 3. a) What towns has _____ visited outside of Ypsilanti?

b) Why was one of the recent trips not connected with school taken?

c) Who went with him?

d) What did he do there?

_____ 4. a) What newspaper and/or magazines do you have in your home at present?

b) Who reads them?

c) Does _____ usually look at them?

(Circle one) Yes No

d) If so, which ones?

_____ 5 & 6 What did you get _____ on (his) last birthday?

(b) For Christmas?

(c) What would you like to get (him) for (his) next birthday or Christmas?

_____ 7. a) Does any member of your family have a library card?

(circle one) Yes No

b) How often is the card used? Once a week--once a month--less often than once a month?

c) When was it used the last time?

_____ 8. Are any of these things available for _____ to use at home at present? (Check if yes)

a) _____ paste
b) _____ paper
c) _____ paints
d) _____ coloring books
e) _____ paper cut-outs
r) _____ books
g) _____ ruler
h) _____ crayons
i) _____ playdough
j) _____ scissors
k) _____ pencils
l) _____ other (specific)

_____ 9. Do you have a dictionary in your home?

(circle one) Yes No

b) Who uses it?

c) How often? Once a week--once a month--less often than once a month? (Circle one)

_____ 10. Do you have an encyclopedia in your home?

(circle one) Yes No

b) Who uses it?

c) How often? Once a week--once a month--less often than once a month? (Circle one)

_____ 11. Did you teach _____ to write (his) name?

(circle one) Yes No

b) To count? (circle one) Yes No

c) To read? (circle one) Yes No

d) All together how much time do you (or your husband) spend trying to help _____ learn?

e) Do you play with _____?

(circle one) Yes No

f) What do you play?

_____ 12. When does _____ usually eat dinner on weekdays?

b) Who eats with (him)? (pleast list)

c) Who does most of the talking at the table?

d) About what?

_____ 13. a) At what times are you together as a family on weekdays?

b) What are some of the things you do together at these times?

_____ 14. a) (If husband is in household) What are some of the things your husband does with _____ on weekdays?

b) On weekends?

_____ 15. a) Is there any adult outside of you (and your husband) that _____ is particularly friendly with?

(circle one) Yes No

b) How often does _____ see (him)?

c) What does (he) do when (he's) with them?

_____ 16. a) Do you read books to _____?

(circle one) Yes No

b) If yes, what kind?

c) How often do you read to (him)?

d) How long does (he) listen?

____ 17. a) Do you suggest that _____ watch any particular Programs? (circle one) Yes No

b) If yes, which ones?

____ 18. a) Have you tried to teach _____ new words? (circle one) Yes No

b) Why?

c) If yes, when did you teach (him) a new word last?

d) What was the word?

____ 19. a) Are you concerned about the way _____ talks? (circle one) Yes No

b) If yes, in what way?

c) Have you tried to get (him) to change? (circle one) Yes No

d) If so, how?

____ 20. How much schooling would you like _____ to receive?

____ 21. How much schooling do you expect _____ to receive?

____ 22. What is the least amount of education you think _____ must have?

_____ 23. a) What kind of work do you think _____ will do when (he) grows up?

b) What kind of work would you not like (him) to do?

_____ 24. a) What are some of the things _____ does that you approve of?

b) Does (he) know that you approve of them?
(cirle one) Yes No

c) How do you show that you approve of them?

d) Did you praise or hug _____ in the last few days for something (he) did?
(circle one) Yes No

e) If yes, what was it that (he) did?

_____ 25. a) Do you want _____ to go to college?
(circle one) Yes No

b) If yes, how much do you think it will cost to send (him) to college? $_____ per year.

c) Have you made any plans for meeting this bill?
(circle one) Yes No

d) If yes, what are some of these plans?

APPENDIX D

PART II: COGNITIVE HOME ENVIRONMENT SCALE
SCORING MANUAL

NOTE: If no information, assign a value of "4".

Scoring Criteria:

1. Grade parents expect child to receive in most school subjects

   7 = A
   6 = B+ A-
   5 = B
   4 = B- C+
   3 = C
   2 = C-
   1 = below C-

2. Grade which would satisfy parents

   7 = A
   6 = A- B+
   5 = B
   4 = B- C+
   3 = C
   2 = C-
   1 = below C-

3. Opportunities for child to travel and amount of effort by parents to provide opportunities

   7 = many opportunities exist through conscious efforts on parent's part (ex. to Greenfield Village - museum, etc.)
   5 = many opportunities exist with no conscious effort on parent's part (4 or more towns)
   3 = some opportunities exist (2-3 towns)
   1 = few or no opportunities exist (1 or no towns)

   Use even numbers to reflect distance and variety of experience

4. Quantity of newspapers and magazines in home

7 = many materials - 4 or more items cited
5 = some materials - 2 or 3 items cited
3 = few materials - 1 item cited
1 = no materials cited

Distinguish on basis of quantity of newspapers and magazines. Do not include books. Use even numbers to reflect usage of materials.

5. Proportion of gifts provided for child which are educational

7 = all of toys are educational
5 = 50% of toys are educational/50% are non-educational
3 = any educational toys
1 = no educational toys

Purpose is to explore intent of mother in purchase. Code according to quantity of educational gifts purchased (blackboard and chalk, puzzles, nesting blocks, book, etc.)

6. Number of educational gifts provided for child

7 = 6 or more items cited not including clothes, money, or food
5 = 4 items cited not including clothes, money, or food
3 = 2 items cited not including clothes, money, or food
1 = no learning supplies or toys cited

7. Presence and amount of use of library card

7 = considerable use of library card (once a week)
5 = some use (once a month)
3 = little use (less than once a month)
1 = no card or no use

Use even number to reflect number who use cards and when card last used.

8. Supplies, materials, and equipment available to child at home

7 = 10 items or more
5 = 7-9 items
3 = 3-6 items
1 = 2 items and under

Based on quantity of items.

9. Presence and use of dictionary in home

7 = dictionary used frequently (once a week)
5 = some usage of dictionary (once a month)
3 = infrequently used (less than once a month)
1 = no dictionary

Use even numbers to reflect number of persons using dictionary.

10. Presence and use of encyclopedia in home

7 = considerable use of encyclopedia (once a week)
5 = some use of encyclopedia (once a month)
3 = little use of encyclopedia (less than once a month)
1 = no use of encyclopedia or no encyclopedia

Use even numbers to reflect number of people using encyclopedia.

11. Assistance provided child in various learning situations

7 = a great deal of time (two hours or more each day)
5 = considerable attempt to facilitate learning (one hour or more but less than 2 hours)
3 = some attempt to facilitate learning (daily but less than one hour)
1 = little or no attempt to facilitate learning

Use even numbers to reflect quality of assistance in learning offered.

12. Family dine together? Amount talking child does at dinner

7 = family is together and child does most of the talking
5 = family is together and child does some talking
3 = family is together and child has opportunity to talk
1 = child does not eat with family

Use even numbers to reflect percent of total family eating together.

13. Amount of time family spends together and amount of verbal interaction

7 = family together a great deal. Conscious effort to exploit situations for purpose of language development
5 = family together daily
3 = family together occasionally
1 = family never together

Use even numbers to reflect amount and quality of verbal interaction which occurs.

14. Amount of time father spends with child and quality of interaction

7 = husband with child both weekends and weekdays. conscious effort made to facilitate learning in a variety of situations
5 = husband with child both weekends and weekdays
3 = husband with child weekends or weekdays
1 = husband never or sporadically with child
9 = no husband

Use even numbers to reflect the quantity and quality and diversifications of lea.ning situations. Increase rating two or more points if learning situation is unusually high regardless of time element.

15. Existence of opportunities for child to have friends among other adults

7 = many opportunities exist through conscious effort of parent
5 = many opportunities exist with no conscious effort of parent (daily)
4 = some opportunities exist (at least twice per week but less than daily)
3 = some opportunities exist (once a week)
2 = few opportunities exist (less than once a week)
1 = no opportunities exist

16. Quantity and quality of reading to child

7 = reads daily
5 = reads several times a week
3 = reads once per week
1 = does not read to child

Use even numbers to reflect time devoted to each reading period and type of books read.

17. Educational use of television

7 = educational programs recommended
4 = frightening or non-desirable programs not recommended
1 = no recommendation made

Use even numbers to reflect quality of recommendations.

18. Teaching new words to child

7 = specific instance and good reason cited
5 = specific instance but vague reason cited
3 = no specific instance but specific reason
1 = no effort

Use even numbers to reflect quality of reason cited and/or quality of effort to teach new words.

19. Parents' concern regarding child's speech and their attempts to correct errors

7 = specific problem of concern cited as well as specified attempt to correct error. Example must be cited.
6 = specific problem of concern cited as well as specific attempt for correction. No example cited.
5 = specific problem of concern cited but no specific attempt to correct error.
4 = general concern about child's speech with a means of change cited.
3 = general concern about child's speech but no effort to change
2 = little concern about child's speech and no effort to change
1 = no concern about child's speech

20. How much schooling parents wish child to receive

7 = graduate from college
6 = attend college
5 = graduate from high school
4 = attend 12th grade, but not graduate from high school
3 = 11th grade
2 = 10th grade
1 = 9th grade or less

21. How much schooling parents expect child to receive

7 = graduate from college
6 = attend college
5 = graduate from high school
4 = attend 12th grade, but not graduate from high school
3 = 11th grade
2 = 10th grade
1 = 9th grade or less

22. Least amount of education parent thinks child must have

7 = grade from college
6 = attend college
5 = graduate from high school
4 = attend 12th grade, but not graduate from high school
3 = 11th grade
2 = 10th grade
1 = 9th grade or less

23. Amount of education required for job parent thinks child will do as an adult

7 = college education required
6 = more than high school education required but less than college degree (nurse, technician)
5 = high school education (skilled labor, office work, clerical)
3 = less than high school completion (construction)
2 = answers such as "up to him" and "whatever makes him happy"
1 = no expectation

24. Behavior of child that parent rewards--intellectual accomplishments?

7 = specific intellectual accomplishments cited in both "a" and "e" - a system of rewards evident
6 = specific intellectual accomplishments cited in both "a" and "e" - no system of rewards evident
5 = specific intellectual accomplishment cited in either "a" and "e"
3 = no differentiation between intellectual and non-intellectual accomplishments
1 = no evidence of reward for intellectual accomplishment

(intellectual accomplishment does not include dressing self, playing well with others, cleaning house, etc.)

25. Does parent want and plan for child to go to college?

7 = knowledge of cost and specific savings plan
6 = definite plan of savings - no knowledge of cost
5 = vague understanding of cost - vague savings plan
4 = no knowledge of cost - vague savings plan
3 = just intention to establish a savings plan
2 = knowledge of cost but no savings plan or desire for child to go to college
1 = no desire for child to go to college

APPENDIX E

INFANT AND MATERNAL HISTORY
YPSILANTI PERRY PRESCHOOL PROJECT
YPSILANTI PUBLIC SCHOOLS

Col 2,3,4,5 Identification Number

___ ___ ___ ___

Col 8 Year of birth
1958=1 1961=4
1959=2 1962=5
1960=3 1963=6
_____

Col 9, 10 Month of birth
01=January
02=December
_____

Col 11, 12 Day of birth
_____

Col 13, 14 Mother's age at child's delivery
_____

REPRODUCTIVE HISTORY

Col 15, 16 Total number pregnancies
_____

Col. 17, 18 Number of living children _____
_____

Col 19 Neonatal deaths
_____

Col 20 Post-neonatal deaths (28 days to one year)
_____

Name_____

Hospital_____

Col 21 Fetal deaths (Fetus 20 weeks or older
_____

Col 22, 23 Interval since previous pregnancy (months)
_____

PRESENT PREGNANCY

Col 24, 25 Weight gain
_____

Col 26, 27 Gestation Period (weeks)
_____

Col 28 Prenatal care: number of visits to clinic or doctor
1= 1-3 4= 10-15
2= 4-9 5= 16+
_____

Col 29 Month of gestation during which prenatal care began
_____

COMPLICATIONS

Related to fetal oxygen deprivation

Col 30 Hypertension/high blood pressure?
1=no
2=yes
0=unknown
____

Col 31 Kidney Infection?
1=no
2=yes
0=unknown
____

Col 32 Preeclampsia or toxemia?
1=preeclampsia
2=toxemia
3=neither
0=unknown
____

Col 33 Mother younger than 18 or older than 35 when baby born?
1=no
2=yes
0=unknown
____

Col 34 Diabetes?
1=no
2=before pregnancy
3=during pregnancy only
0=unknown
____

Col 35 Placenta attachment problems?
1=no
2=premature rupture
3=abruptia placentae
4=placenta praevia
0=unknown
____

Col 36 Heart trouble?
1=no
2=congenital
3=rheumatic
4=other
0=unknown
____

DELIVERY COMPLICATIONS

Col 37 Type of delivery
1=normal, no or low forceps
2=C. section
3=breech
4=difficult forceps (high or mid)
0=unknown
____

Col 38 Complications related to oxygen deprivation?
1=no
2=abruptia placenta
3=prolapsed cord
0=unknown
____

Col 39 Labor
1=spontaneous
2=induced
0=unknown
____

Col 40 Duration of labor
1=no labor
2= <6°
3=6-12°
4=12-24°
5= >24°
0=unknown
____

INFANT'S CONDITION AT DELIVERY

Col 41, 42 Weight lbs.
____

Col 43, 44 ozs.
____

Col 45 ____ Birth
1=single
2=1st of twins
3=2nd of twins
4=triplets

Col 46 ____ Sex
1=male
2=female

INFANT MORBIDITY

Col 47 ____ Breathing
1=spontaneous
2=delayed, oxygen supplied
3=endotracheal tube
0=unknown

Col 48 ____ Number of days oxygen supplied?
1=no oxygen supplied
2=1
3=2
4=3
5=4 or more
0=unknown

Col 49 ____ Hypoglycemia: symptoms?
1=none
2=apnea
3=cyanosis
4=tremors
5=convulsions
0=unknown

Col 50 ____ Hypoglycemia: predisposing factors?
1=none
2=diabetic mother
3=smaller of twins by 1/2 lb.
4=low birth weight for gestation
5=less than 38 weeks gestation
6=post maturity (over 42 weeks gestation)
0=unknown

Col 51 ____ Respiratory problems: Symptoms
1=none
2=incubator, no oxygen
3=incubator, with oxygen
0=unknown

Col 52 ____ Respiratory problems: predisposing factors
1=none
2=less than 38 wk. gestation
3=diabetic mother
4=prenatal hypoxia
0=unknown

Col 53 ____ Juandice: Symptoms
1=none
2=proven: ≥12 ≤ 20
3=proven: >20
4=exchange TF
0=unknown

Col 54 ____ Juandice: predisposing factors
1=none
2=parent's blood incompatible
3=neonate bruised or fractured
4=inactive liver
0=unknown

Col 55 Size by gestational age
1=normal
2=large
3=small

APPENDIX E

PART II: COMPUTATION OF TOTAL BIRTH COMPLICATIONS SCORE

The following three subscores were summed for one overall score on the Infant and Maternal History Schedule.

1. Complications during pregnancy (sum of Complications recorded in columns 30 to 36 of the Infant and Maternal History Schedule).

2. Complications during delivery (sum of Complications recorded in columns 37 to 39 of the Infant and Maternal History Schedule).

3. Complications in newborn infant (sum of Complications recorded in columns 47 to 55 of the Infant and Maternal History Schedule).

APPENDIX F

PUPIL BEHAVIOR INVENTORY

Pupil Name_____ Teacher_____

Please write in for each item the letter(s) of the rating chosen for this pupil (see alternatives in box). It is not necessary to spend a great deal of time in assessing the pupil. Please answer all items, even if you are uncertain or have little information. If you cannot answer an item, please write in "don't know."

ALTERNATIVE RATINGS
VF - Very Frequently
F - Frequently
S - Sometimes
I - Infrequently
VI - Very Infrequently

___ 1. Shows initiative
___ 2. Blames others for trouble
___ 3. Resistant to teacher
___ 4. Alert and interested in school work
___ 5. Attempts to manipulate adults
___ 6. Appears depressed
___ 7. Learning retained well
___ 8. Absences or truancies
___ 9. Withdrawn and uncommunicative
___ 10 Completes assignment
___ 11 Influences others toward troublemaking
___ 12 Inappropriate personal appearance
___ 13 Seeks constant reassurance
___ 14 Motivated toward academic performance
___ 15 Impulsive
___ 16 Lying or cheating
___ 17 Positive concern for own education
___ 18 Requires continuous supervision
___ 19 Aggressive toward peers
___ 20 Disobedient
___ 21 Steals
___ 22 Friendly, and well-received by other pupils
___ 23 Easily led into trouble
___ 24 Resentful of criticism or discipline
___ 25 Hesitant to try, or gives up easily
___ 26 Uninterested in subject matter
___ 27 Disrupts classroom procedures
___ 28 Swears or uses obscene words
___ 29 Appears generally happy
___ 30 Poor personal hygiene
___ 31 Possessive of teacher
___ 32 Teases or provokes students
___ 33 Isolated, few or no friends
___ 34 Shows positive leadership

Appendix F

Part II: Pupil Behavior Inventory Factors

Item Scores: The items are scored as follows (except those items marked by an asterisk):

1. Very frequently (VF)
2. Frequently (F)
3. Sometimes (S)
4. Infrequently (I)
5. Very Infrequently (VI)

If marked by an asterisk, items are scored as follows:

1. Very Infrequently (VI)
2. Infrequently (I)
3. Sometimes (S)
4. Frequently (F)
5. Very frequently (VF)

Factor Scores: Sum of scores for items on factor. Higher scores are desirable.

Factor I: Classroom conduct

Items:
2. blames others for trouble
3. resistant to teacher
5. attempts to manipulate adults
11. influences others toward troublemaking
15. impulsive
18. requires continuous supervision
19. aggressive toward peers
20. disobedient
23. easily led into trouble
24. resentful of criticism or discipline
27. disrupts classroom procedures
32. teases or provokes students.

Factor II: Academic motivation

Items:
1. shows initiative *
4. alert and interested in school work *
7. learning retained well *
10. completes assignments *
14. motivated toward academic performance *
17. positive concern for own education *
25. hesitant to try, or gives up easily
26. uninterested in subject matter
34. shows positive leadership *

Factor III: Socio-emotional state

Items: 6. appears depressed
9. withdrawn and uncommunicative
22. friendly, and well-received by other pupils *
29. appears generally happy *
33. isolated, few, or no friends

Factor IV: Teacher dependence

Items: 13. seeks constant reassurance
31. possessive of teacher

Factor V: Personal behavior

Items: 8. absences or truancies
12. inappropriate personal appearance
16. lying or cheating
21. steals
28. swears or uses obscene words
30. poor personal hygiene

Appendix G

Ypsilanti Rating Scale

Items:
1. Social relationship with classmates
2. Social relationship with teacher
3. Level of verbal communication
4. Degree of imagination and creativity shown in handling materials and equipment
5. Level of academic readiness
6. Level of curiosity shown
7. Level of emotional adjustment
8. Prediction of future academic success
9. Degree of your desire to work with this child
10. Degree of trust in total environment
11. Direction of interest (Introversion - Extroversion)
12. Mother's degree of cooperation shown
13. Prediction of mother's future school relationship

The teachers rate (assign a score from 1 to 7) all pupils on the first item, then rate all pupils on the second item, etc. High scores are positive.

Factors: Sum item scores for each item.

Factor I: Academic potential

Items:
4. degree of imagination and creativity shown in handling materials and equipment
5. level of academic readiness
8. prediction of future academic success

FactorII: Mother participation

Items:
12. mother's degree of cooperation shown
13. prediction of mother's future school relationship

Factor III: Social development

Items:
1. social relationship with class mates
2. social relationship with teacher
6. level of curiosity shown

Factor IV: Verbal skill

Items:
3. level of verbal communication

Appendix G cont.

Factor V: Emotional adjustment

Items: 7. level of emotional adjustment
10. degree of trust in total environment