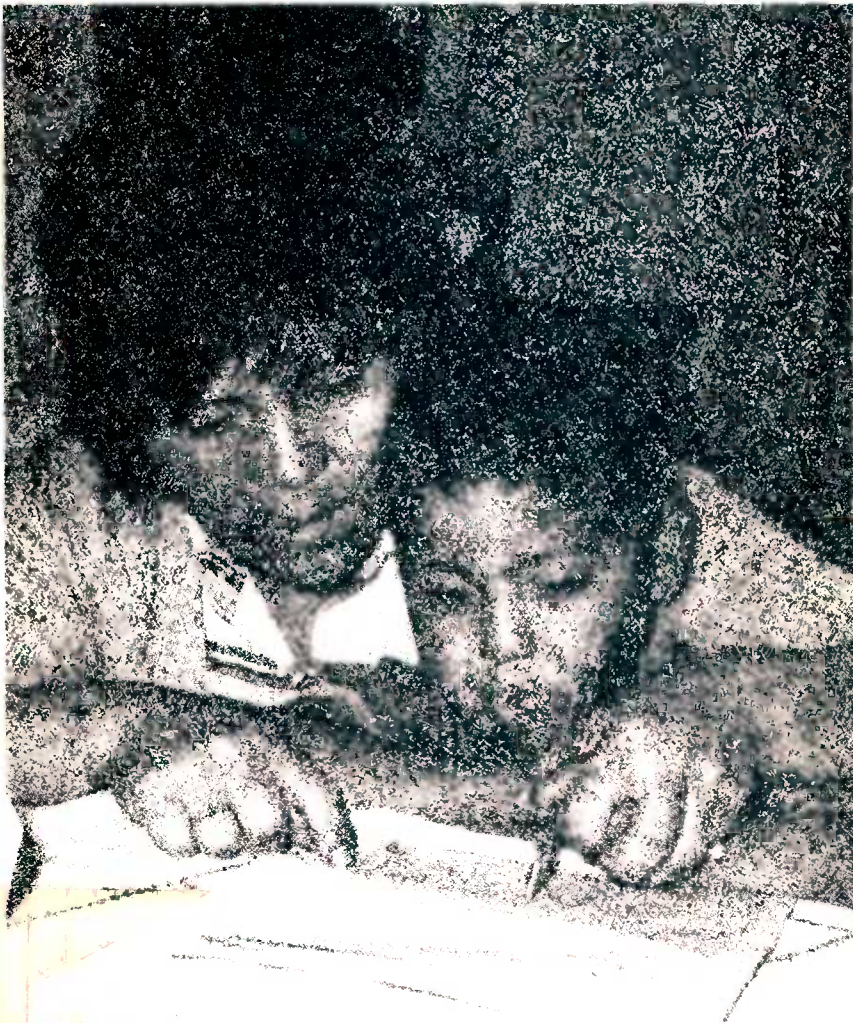


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# Preventing School Failure:

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*The Relationship Between  
Preschool and Primary Education*



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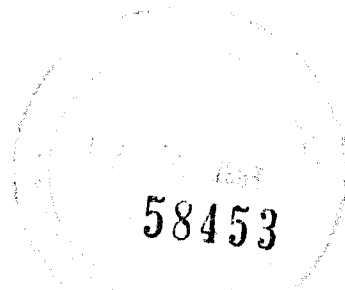
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# **Preventing School Failure: The Relationship Between Preschool and Primary Education**

**Proceedings of a workshop on preschool research  
held in Bogota, Colombia, 26-29 May 1981**



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## **Résumé**

Cette publication contient les exposés présentés au cours d'un séminaire sur la relation entre l'éducation préscolaire et primaire qui a été tenu à Bogota, Colombie, en mai 1981, sous les auspices du CRDI et de la Fondation Ford. Le séminaire a réuni des chercheurs en éducation préscolaire venus de diverses régions du monde et spécialisés dans différentes disciplines. L'éveil précoce des enfants fut examiné à la lumière des études de cas et des programmes nationaux présentés, et analysé en fonction des effets à court et à long terme qu'il peut avoir sur le développement de l'enfant et son succès lors de son entrée dans le système scolaire. Les travaux sont groupés sous trois grands thèmes : recherche et action en éducation préscolaire et primaire; considérations sur le problème de l'éducation préscolaire et primaire; et discussions et recommandations générales.

## **Resumen**

Esta publicación contiene las ponencias presentadas en un seminario sobre la relación entre educación preescolar y primaria, celebrado en Bogotá, Colombia, en mayo de 1981 bajo los auspicios del CIID y la Fundación Ford. El seminario reunió a investigadores de la educación preescolar procedentes de diversas regiones del mundo y con diferentes formaciones disciplinarias. La estimulación infantil temprana fue vista a la luz de los estudios de caso y los programas nacionales presentados, y analizada en función de los efectos que a corto o largo plazo puede tener sobre el desarrollo del niño y su éxito al ingresar al sistema educativo formal. Tres amplias secciones agrupan los trabajos de acuerdo con los temas tratados: investigación y acción en educación preescolar y primaria; consideraciones sobre la problemática preescolar y primaria; y discusiones y recomendaciones generales.

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# Lasting Effects of Preschool Education on Children from Low-Income Families in the United States

John R. Berrueta-Clement, Lawrence J. Schweinhart, and David P. Weikart<sup>1</sup>

## Introduction

The issue of the possible effects of quality preschool education upon the long-term prospects of children has been a subject of constant concern for many years in the United States. Despite major early education initiatives (notably, the well-known Head Start program), it is only recently that unequivocal, solid evidence of long-term effects has become available. This evidence indicates that early education programs of high quality can have a significant positive long-term impact on children from low-income families (Schweinhart and Weikart 1980). Perhaps most exciting is that it appears the impact may have a significant effect on the entire life course of participating individuals. To the extent that preliminary economic analyses have succeeded in assigning monetary costs and returns, the evidence available indicates that early education may appreciably reduce the costs that society later must bear for each child and indeed that the costs of preschool can be more than recovered over the lifetimes of the participants.

There are still many issues to be resolved: questions need to be answered, for instance, about the nature of the population that can benefit most, about the intensity of the intervention efforts required, and about the administrative approaches needed to extend programs from small-scale interventions to networks of local programs with goals shared throughout a nation

(or to massive centralized national efforts) with minimal loss of quality and maximal coverage. But the principal finding is that preschool can have important positive long-term effects.

This paper outlines the evidence supporting this finding in the United States. It draws primarily on the long-term longitudinal studies of the High/Scope Foundation. The paper also discusses the application of these findings to policies regarding preschool education in countries other than the United States — especially the developing nations.

## History of the Research

Early childhood education has a long tradition and deep historical roots; but its modern history in the United States goes back just 20 years. J. MacVicker Hunt's *"Intelligence and Experience"* published in 1961 condensed the various viewpoints regarding developmental processes in young children and their modifiability by the environment, giving impetus to a wide variety of research efforts and services. Within the next 5 years a number of innovators established programs for 3- and 4-year-olds; at the same time, key social changes regarding segregated education led federal government policymakers to adopt a radical new approach. The Great Society, equality of educational opportunity; preschool education as a concept appeared to fit the new approach naturally. The children of the lower class were "disadvantaged," and, therefore, their performance in the school system was impaired. If they could just be given a "head start" they would enter school on an equal intellectual and academic footing with their middle-class, "advantaged," peers.

In 1965, President Johnson created the Office of Economic Opportunity; one of its key projects was the national Head Start summer program.

<sup>1</sup>High/Scope Educational Research Foundation, Ypsilanti, Michigan, USA. The research reported here was supported in part by the US Office of Education (1964-67), the Spencer Foundation (1971-74), the Carnegie Corporation of New York (1975-80), the US Administration for Children, Youth and Families (1976-80), and the Office of Special Education (1980-83).

The initial 8-week effort was soon extended to a full year. The fate of those early high expectations is by now well known: evaluators failed to find any intellectual or academic short-term impact of Head Start participation. Although the findings generated intense debate in the academic community, policymakers felt that preschool for the "disadvantaged" was not educationally worthwhile.

Head Start proved to have amazing political vitality. The program was repeatedly saved by Congress, a feat accomplished largely by the parents of Head Start children. The program's rationale was broadened to include social and health services. Over the next decade, Head Start increased its funding at a steady pace and survived two transfers to different bureaucratic agencies. The enthusiasm for the concept and the quality of the service gave Head Start its strength. Written off by the experts, the politicians, and the news media, the program found other supporters, including the parents, who could see in their own families the benefits and importance of preschool.

While Head Start languished and survived, a quiet revolution was unfolding. The social changes that gave rise to the Great Society continued; at the same time, information on the importance and impact of preschool had been accumulating from that group of early studies and programs. The first compilations received little acclaim from professionals or the lay public; only recently have middle- and long-term findings become available. One of the earliest of these preschool studies is the Ypsilanti Perry Preschool project.

The project was initiated by Weikart and his associates in 1962 to determine how preschool education could benefit disadvantaged children. To this end, two groups of children, randomly selected, were formed between 1962 and 1967 — one group of 58 children who attended the Perry Preschool, and one group of 65 children who had no preschool — a total of 123 children in the longitudinal sample.

The Perry Preschool study was an attempt to intervene in part of the cycle of poverty — the ongoing progression of undesirable social and educational conditions, such as school failure, early withdrawal from school, and juvenile delinquency. Some early indicators of these results could be and were assessed shortly after the preschool experience. Other results, of greater consequence, could only be assessed after the passage of time, as project participants passed through adolescence into adulthood. Thus, the evaluation became a longitudinal study, with

data collected at regular intervals throughout the 19 years since it began. A comprehensive assessment of project participants at age 19 is currently in progress.

### Sampling and Group Assignment

The study took place in Ypsilanti, Michigan, a city of about 30 000 located 48 km west of Detroit, USA. The children came from families in the attendance area of the Perry Elementary School, at the time an exclusively black section of town. This neighbourhood was selected because the school had a history of low academic achievement.

The children entered the study in five successive groups, with each group of about 25 children being equally divided into two groups: children who attended preschool and those who did not. The age of the child on entering the project was a selection criterion. In the first year of the project, a group of 4-year-olds entered the project as well as a group of 3-year-olds. In each of the following years, a new group of 3-year-olds entered the project to replace the graduating group of 4-year-olds. Thus, one group entered the project at age 4 and remained for 1 year, and four groups entered the project at age 3 and remained for 2 years. This procedure permitted the investigators to provide preschool education to 58 children over 5 years, without the class size ever exceeding 25 children.

Two measures were used as criteria for inclusion in the sample: the family's socioeconomic status and the child's score on the Stanford-Binet Intelligence Scale. Each September the names of all families with children of the appropriate age were drawn from the Perry school census. The socioeconomic status of these families was determined by a formula based upon the educational level reached by the parents, the occupation of the head of the household, and the household density in rooms per person. If the family's socioeconomic status (SES) score was below a specified level, the Stanford-Binet Intelligence Scale was applied to the child. Children with low intelligence quotient (IQ) scores on this test, but with no evidence of organic impairment, became part of the study sample. To qualify for the project, a child's IQ had to be 90 or lower. Eleven percent of the sample had IQ test scores lower than 70. The range between 70 and 85 was at the time included in the official definition of mental retardation; today it is not.

Each year, the children were assigned randomly to either the experimental group or the control group on the basis of earlier IQ tests, with adjustments to balance the groups with respect to



sex ratio and average socioeconomic status. The actual procedure was as follows. The children were classified according to their IQ test scores, then sorted into two groups. Children with similar scores were moved about to balance the groups with respect to sex ratio and average SES. After one group was assigned arbitrarily to preschool any younger siblings were assigned to the same group as their older siblings in the project, so as to maintain the complete independence of the two groups. Finally, five children were transferred from the experimental group to the control group as they were unable to attend preschool because they lacked transportation or their mothers worked.

At the time of entry into the study, the two groups were essentially the same in Stanford-Binet IQ scores, socioeconomic status, birth order, family size, the proportion of persons receiving assistance from social welfare organizations, the proportion of boys, father's presence, and father's employment; the only statistically significant difference at entry between the families of the children who were to attend preschool and those who would not occurred in the proportion of families with working mothers. There were relatively more working mothers in the group of children who did not attend preschool, a deliberate difference owing to the policy of the study. Eleven years later, the proportion of working mothers was the same for both groups. In fact, this second assessment of family features showed the two groups continued to be essentially identical in all major characteristics.

### The Preschool Program

The program of preschool education had two major components: daily attendance by the children in a preschool classroom and weekly home visits by a teacher. The children remained in the program for 2 years (1 year for the first group) from October to May. The classroom program ran for 2½ hours a day, 5 days a week, with a teacher-child ratio of 1:6. The weekly home visits to the mother and child lasted about 1½ hours.

The preschool program emphasized individualized support of the child's cognitive development. At the same time, the Perry project was also a curriculum development project; the curriculum evolved over the years, as the staff sifted its experience for better strategies and as the focus upon cognitive-development theory became firmer and more articulate. The curriculum at the end of the preschool operation is described in the book *"The Cognitively Oriented*

*Curriculum"* by Weikart et al. (1971).<sup>2</sup> In the research plan presented here, curriculum development is regarded simply as an undetermined variation in the preschool curriculum.

### Assignments

Three standardized tests are focused upon in this paper: the Stanford-Binet Intelligence Scale (1960 form L-M and 1960 norms), the Wechsler Intelligence Scale for Children or WISC (1949 edition), and the California Achievement Test or CAT (lower primary and upper primary levels, 1957 edition; level 4, 1970 edition). The Binet was given as a pretest in the fall before each group of children entered the project and at the end of each school year from the end of the first year of preschool through fourth grade. The WISC was given at the end of the eighth grade. (The change from the Binet was made because the WISC was judged to be more suitable for older children and provides subtest scores as well as a total score.) The CAT was given at the end of each school year from first grade through fifth grade and at the end of eighth grade.

Subject loss was moderate for all of these tests. An average of 82% of the sample were given the annual achievement tests. On the important eighth grade testing, 95 of the 123 children in the sample (77%) took the CAT. Tested subjects were compared to untested subjects on a variety of characteristics, including preschool group membership and those family features considered upon entering the program. No differences between tested and untested subjects were statistically significant.

Other aptitude tests were also administered, first a pretest within 3 months of preschool entry and, subsequently, tests given annually from the end of the first year of preschool to the end of third grade. These tests were: the Peabody Picture Vocabulary Test; the Arthur Adaptation of the Leiter International Performance Scale, a nonverbal IQ test; and the Illinois Test of Psycholinguistic Abilities or ITPA (experimental edition; McCarthy and Kirk 1961).

The children's social behaviour and academic potential were assessed in school by two rating scales completed annually by the elementary teachers from the end of kindergarten through to the end of third grade: the Pupil Behaviour Inventory and the Ypsilanti Rating Scale. The two rating scales are summarized by nine factors

<sup>2</sup>The curriculum has continued to evolve; see "Young Children in Action — A Manual for Preschool Educators" by Hohmann, Banet, and Weikart 1979.

having to do with academic orientation and classroom behaviour. Sample retention on these rating scales averages 82%.

Another rating scale, applied within 3 months of project entry, was the Maternal Attitude Inventory or MAI, which measures the mothers' attitudes toward childrearing in general. The Cognitive Home Environment Scale (CHES) was applied to the parents of the children in all groups in the spring of 1966; the CHES measures the parent's educational practices and the nature of the home as an environment for learning.

At age 15 the subjects and their parents participated in comprehensive structured interviews. The data were collected by qualified personnel distributed as evenly as possible to minimize the effects of any possible biases. At testings after preschool, testers were not informed whether the children they tested had attended preschool or not.

Statistical Analysis

The principal statistical analysis of the results presented here is multiple linear regression. This technique was used to equalize the effects of 10 covariables on the outcome variables and then

analyze the effects of preschool group membership as the last variable entered. The values indicated in Fig. 1 and 2 and in Table 1 have been adjusted to reflect the effects of these covariables. Multiple regression analysis in effect removes the cumulative impact of variables used as covariables on the outcome variables — greatly increasing the power and sensitivity of the analysis. In other words, the analysis virtually eliminates the possibility of group differences being attributable to anything other than preschool.<sup>3</sup>

Four variables for which data were actually collected before or at project entry were used as covariables: the IQ score on the Stanford-Binet, the computed value of the socioeconomic status of the family, whether the mother was employed or not, and the mother's level of education. The remaining six covariables were derived from data collection efforts begun soon after project entry.

<sup>3</sup>Multiple regression analysis under certain conditions can create or enlarge differences not present in the raw data before statistical adjustment. In fact, the opposite was the case for the more pronounced group differences reported here. The magnitudes of preschool IQ and eighth grade achievement differences were reduced by the statistical adjustment.

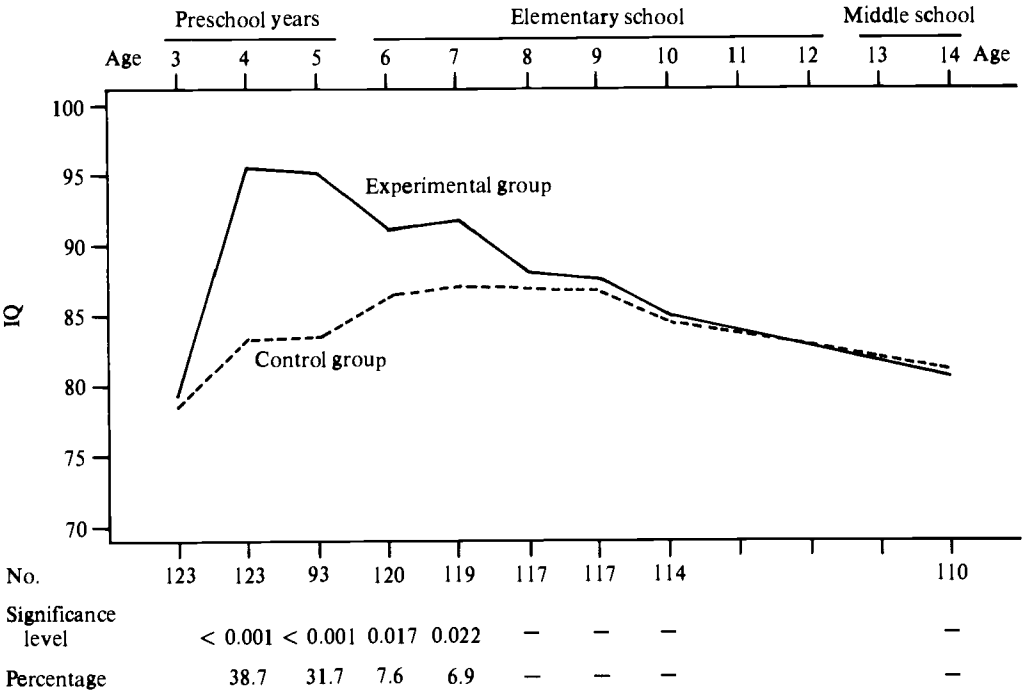


Fig. 1. Cognitive ability by group over time. (Stanford-Binet tests, given at age 3 through 10, have IQs with a national population mean of 100 and a standard deviation of 16; WISC tests, given at age 14, have IQs with a national population mean of 100 and a standard deviation of 15.)

These include the IQ score from the Arthur adaptation of the Leiter test and the scores for the Illinois Test of Psycholinguistic Abilities and the Peabody Picture Vocabulary Test, as well as the scales for assessing the mothers' attitudes and two home-environment characteristics: the home as an environment for learning and the parent as

teacher. Effects associated with the preschool intervention were statistically removed from these latter variables, and the residual scores were used as covariables for the analyses reported below. The residual scores provide the best available indicators of what variable levels would have been in the absence of early intervention.

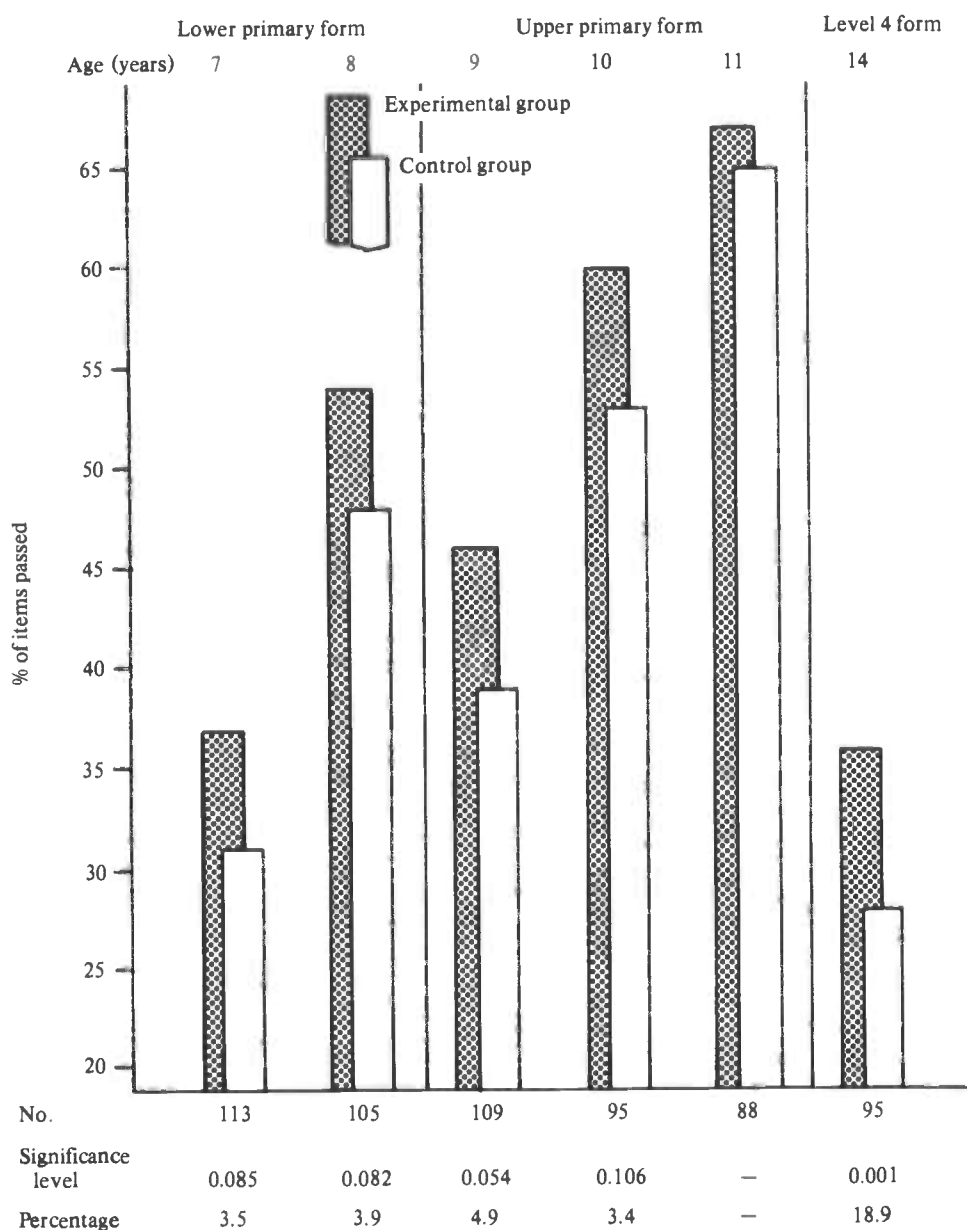


Fig. 2. Total school achievement by group over time. The  $\alpha$ , an index of the consistency of measurement over time, was 0.953. The  $\alpha$  for the age 14 test (only for which  $\alpha$  was assessed) was 0.966.

Table 1. Magnitude of effects of preschool education on IQ test scores and academic achievement.

Time (Spring of each year)	IQ test score		School achievement	
	Variance accounted for (%) <sup>a</sup>	Level of significance <sup>b</sup>	Variance accounted for (%) <sup>a</sup>	Level of significance <sup>b</sup>
<i>Preschool</i>				
Year 1	19	< 0.001	No measurement	
Year 2	10	< 0.001	No measurement	
<i>Kindergarten</i>	4	0.009	No measurement	
<i>Grade</i>				
1	4	0.016	1	0.083
2	0	n.s. <sup>c</sup>	3	0.038
3	0	n.s.	3	0.029
4	0	n.s.	5	0.015
5	No measurement		4	0.022
8	0	n.s.	9	0.004

<sup>a</sup>Increase in the squared multiple correlation owing to preschool, over and above the effects of 10 covariables described in the text. All effects favour the children who attended preschool.

<sup>b</sup>Probability, given a directional hypothesis, that the reported proportion of variance accounted for occurs by chance.

<sup>c</sup>Not significant (n.s.): probability greater than 0.10.

## Analytic Findings

### Cognitive Ability and Academic Achievement Over Time

Figure 1 presents the pattern of differences in Stanford-Binet IQ scores over time between children in a successful preschool and children without preschool, made familiar by numerous studies. Before preschool the groups were virtually identical in IQ. The children who attended preschool experienced a gain of 15 points while they were in preschool, almost all during the first year. Meanwhile, the children who did not attend preschool had a rise in Stanford-Binet scores of four points, which probably represents the extent of statistical regression to the population mean for these groups. Hence, there was a difference of 12 points between groups at the end of as many as 2 years of preschool. One year after preschool, the difference had declined to some five points, at which level it remained through first grade. By the end of third grade, there was no longer a difference between groups, and no difference of consequence appeared thereafter.

The CAT results presented in Fig. 2 are in striking contrast to the results for cognitive ability presented in Fig. 1. The group difference favouring preschool, instead of disappearing during the primary school years, remained constant and even grew slightly. By the eighth grade the group difference corresponded to more than a year in terms of grade norms.

At the eighth grade for the first time, the children with preschool had significantly higher scores ( $p < 0.05$ ) in the three main divisions of the CAT: reading, language, and arithmetic.

The magnitude of group differences in cognitive ability and academic achievement over time is presented in Table 1. The test results suggest a three-part pattern of changes in preschool IQ and academic achievement. Preschool experience had an immediate effect on IQ during preschool, little or no effect on IQ after the first 2 years of school, and a cumulative effect on academic achievement. By eighth grade almost one-half of the children with preschool experience scored higher than did the children without preschool. In fact, 49% of the children who had attended preschool achieved a fifth-grade level or above, whereas only 17% of the children who had not attended preschool did that well.

### Classroom Behaviour and Grade Placement

The classroom behaviour of the children who attended preschool was consistently rated more highly by kindergarten and first, second, and third grade teachers than was the behaviour of the children without preschool. Differences were slight, but they persisted over the 4 years of assessment. To strengthen the stability and validity of the teacher ratings, each of the nine factors was averaged across at least three points of data collection. The factor "independence from teacher" on the Pupil Behaviour Inventory did

not significantly differ between the groups. The group that attended preschool, however, was rated significantly better in the remaining eight factors (N = 105 for Ypsilanti Rating Scale (YRS), N = 95 for Pupil Behaviour Inventory (PBI)):

Factor	Significance level
Academic motivation (PBI)	0.04
Academic potential (YRS)	0.06
Verbal skill (YRS)	0.06
Social development	0.03
Emotional adjustment (YRS)	0.06
Classroom conduct (PBI)	0.03
Socioemotional status (PBI)	0.08
Personal behaviour (PBI)	0.04

It was also found that the totals of the rating scores on the academic motivation and academic potential scales were excellent predictors of eighth grade achievement with correlations of 0.697 and 0.711, respectively. These correlations are greater than those between concurrent IQ and eighth grade achievement (0.702) for this sample.

The children who attended preschool were found to be more successful as a group in school, as measured by the schools' own main criteria of success.

### Economic Costs and Benefits to Date

A cost-benefit analysis of the Perry Preschool Project was carried out with data collected in 1973. The findings for 2 years of preschool, based on a sample size of 95, are presented here. The amounts were originally calculated based on 1958 constant dollars; these values are translated here into 1979 dollars by multiplying by 2.4, the rate of inflation in the intervening period. The cost of two years of preschool for one child in 1979 US dollars was US \$5722 (US \$2861 per year).

Three types of benefits were included in the analyses: (a) savings from lower education costs; US \$3206 per child was saved because fewer of the children who attended preschool required special education or institutional care; (b) benefits from an increase in projected earnings — US \$10 325 per child; lifetime earnings were projected for each child on the basis of projected educational level, age, race, and sex. These descriptions were converted to projected lifetime earnings determined from survey data, particularly the 1970 census; and (c) the value of the mother's time freed when the child attended preschool — US \$638 per child; based on an average

wage rate for the homemaker in 1979 dollars of US \$3.38.

The total benefits calculated by these methods were US \$14 170 per child, against the cost of US \$5722 per child. The benefits amount to a 248% return on the original investment.

Work is currently in progress at the Foundation to update and extend the economic analyses through the end of secondary school.

## Other Findings

### Youth and Parent Interviews

This section summarizes the major findings of interviews with a total of 99 15-year-old children from both groups and their parents.

*Value placed on schooling:* The youths who attended preschool placed a greater value on schooling at age 15 than those who did not attend preschool. The construct "value placed on schooling" was measured on a seven-point scale that contrasted the value of schooling with experiences outside of school in terms of learning and personal worth. Although the overall scale showed a statistically significant difference, the item that most clearly distinguished the groups was the statement "all persons should have at least a high school (secondary) education," with which 86% of the youths with preschool and 73% of those without agreed.

*Other aspects of school commitment:* The youths who had attended preschool were more likely to have thought of going to college (77%) than those who had not gone to preschool (60%). The preschool attendees were more likely to say that schoolwork required preparation at home and that they spent time each week doing homework. Finally, the parents of the preschool youths felt their children were more willing to talk about what they were doing at school.

*Parent satisfaction and aspirations:* About 6 out of 10 parents of the children who had attended preschool expressed satisfaction with their offspring's school performance (59%), whereas slightly over one-fourth of the parents of the children who had not attended preschool expressed such satisfaction (28%). The parents of the preschool attendees also expressed higher educational aspirations for their children.

*Adolescent misconduct and delinquent behaviour:* Preschool education led to a reduction in the rates of self-reported misconduct and delinquent behaviour by adolescents. For all 17 cate-

gories of possible deviant or delinquent behaviour of varying degrees of seriousness, 36% of the youths who had attended preschool admitted to having committed five or more offences, as compared to 52% of those who had not attended preschool. Similarly, 43% of the preschool youths claimed they had not committed any offences, as compared to 25% of those with no preschool experience.

The children who had attended preschool were found in a second analysis to have lower levels on a scale of serious delinquency, consisting of weighted self-assessments of delinquent behaviour involving violence or theft. The question that revealed the greatest difference between the groups was: "Have you ever taken something by force from another person?", to which 98% of the youths with preschool experience and 85% of those without preschool experience answered "No."

## Discussion

The picture painted by the longitudinal findings of the Ypsilanti Perry Project is clear. The treated children showed evidence of immediate program impact: short-term, positive changes in measures of cognitive ability, followed by differences in measures of classroom behaviour and social adjustment according to the assessment by the teachers in the early primary grades. Consistent with the teachers' perceptions, actual measures of academic achievement showed clear differences lasting into the eighth school year, displaying remarkable permanence and a cumulative, meaningful educational impact. The extent of the impact can be interpreted by reference to the norms for the achievement tests used: by about eighth grade, the youths who attended preschool achieved, on the average, academic performance levels typical of children a grade more advanced, as contrasted with the levels of the children not receiving the treatment. By about the fourth grade, these differences in academic performance had extended to differences in school success: there is a measurable difference in the proportion of children requiring special education services or held back a grade.

In short, there appears to be a coherent pattern of ongoing changes in the children who attended preschool. The data presented here show that, if the untreated group is viewed as what the treated group might have been but for preschool, the program produced major differences. Projections can be made from these findings for the ensuing years. In the United States, adolescents must attend school until they are at least 16 years

of age; consequently, none of the adolescents could have dropped out of school at age 15. From the levels of academic performance and school success measured at age 15, it is possible to predict differences in the dropout rates and final educational levels attained for the two groups.

What is more, the indicated differences in self-reported misconduct and delinquency suggest that the effects of preschool extend beyond the sphere of schooling. For reasons not yet well understood, the youths who attended preschool appeared to get into trouble less often than those who did not. It is not difficult to see how such a difference could be meaningful in late adolescence and early adulthood in areas such as employment — getting and keeping a job, being promoted — the final educational level attained, family formation, or even coping with the normal stresses of life.

The consistency of these findings with respect to both time and outcome indicates that the intervention led to profound changes in the youths. Having once been essentially the same in nearly every way measured, the two groups of the experiment are now clearly different and appear to be on different tracks — headed in different directions. Such results will doubtless have a lasting, lifelong impact.

There are, however, three significant points to be made. First, in a number of areas there were no changes over time or no apparent differences. An example is the IQ test scores. The areas of unlasting change are important indicators of treatment effect, as are those that showed no change. Second, the intervention's effects are meaningful but limited; the level of risk of educational failure declines, but by no means disappears. Finally, the extent of the effects is an important sign probably leading toward an understanding of the limits of what can be achieved by early education programs with populations at risk.

The answer to the original question raises a host of new queries. Perhaps the most fundamental is *how*? What was it about the preschool program and its early impact that led to long-term differences? The questions unfolding from this major one lead to a whole structure of inquiry to which current Foundation research efforts are directed. Our view is that there are three major areas that intervene between quality early childhood education (as exemplified by the Perry Preschool) and later success. Two of these areas have to do with changes in the children themselves: in cognitive functioning and in the development of the social skills needed to adapt to formal schooling. A third area worthy of consideration emphasizes the changes produced in the family

rather than in the children.

Identification of the variables that intervene between the short- and long-term impacts is important to understanding the applicability of these findings in broader contexts. If a logical order can be assigned to these paths, we will have increased our understanding of the benefits of early childhood education with significant policy implications. Even if the changes in these major areas cannot be distinguished from each other or from the most important features of the family structure, the combinations of features that allow the effects to spread can be regarded in the light of the social and personal contexts in which early education is considered as a possible form of intervention.

To extend these findings to other nations, and in particular to those in the developing world, two questions need to be answered: how are the levels and types of risk comparable and to what extent are the contexts found in the developing world comparable in providing the intervening connections that might translate short-term impact into long-term success?

### **Toward Obtaining Long-Term Effects in Developing Nations**

Two important conditions limit the possibility of extending the effects of a quality preschool program in the United States to similar programs in other countries. First, the participants were judged to be at real risk of educational failure in *local terms* and, second, the program took place in a context of universal (indeed compulsory) public primary and secondary education.

We stress the first condition because it seems important to understand what we mean by risk: the risk might be very different in other countries. The children of the Perry project were destined (as a group) for low levels of academic achievement, a need for special supportive services, and an early termination of their education. Although completing 9 or 10 years of primary and secondary education might be viewed as a highly favourable result in other countries, this is not the case in the United States. The nature of both the short-term effects and the possible forms of intervention that emerge indicate that the local educational risk may be at least partially altered through early childhood education intervention. If the children who risk educational failure can be made to appear more "schoolable" to their teachers, and if lasting effects on school achievement can thus be obtained, then there is reason to expect that other such programs will have similar

effects. Because low-income groups at equally high risk of educational failure can be identified in every developing nation, there is reason to expect that early childhood education would help diminish educational failure when these groups are targeted for intervention. The risk must be measured in local terms, as must the desired impact; what cannot be disputed is that the level of risk for low-income groups in all countries is high. Thus, we feel that early childhood education merits consideration as a policy alternative wherever a high risk of educational failure can be identified.

But what of the local context in the United States? Public education is free and, therefore, available to all, and indeed by law in most states children must attend school until the age of 16. This is not the situation in most developing nations: public education resources are insufficient in many countries; most educational facilities are, therefore, private; and many are overcrowded — especially those serving children of low-income families. In Latin America, for instance, the risk of educational failure is expressed in terms of a much lower opportunity level than in the United States or Europe. In our own observations in low-income urban areas in Colombia, it is not at all uncommon to find primary schools with five first-grade and five second-grade classes, two third-grade classes, and one fourth- and one fifth-grade class. No statistical analyses are required to estimate the grade levels attained by pupils in such a school system.

How can the educational contexts of developed and developing nations be compared? Specifically, what can be said about the potential long-term impact of preschool if school is not universal and compulsory? To answer this question, this long-term impact must be studied *in situ*. In this paper, however, we must examine the mechanisms linking early intervention to long-term results.

There are two ways in which the short-term effects of preschool can extend to long-term success where schooling is not universal. The first is by taking better advantage of the educational opportunities available. From the Perry findings, we can see that children can be helped to respond in ways that make them appear more "schoolable" — that is, they can be given an early advantage. The Perry findings suggest that this early advantage will lead to the acquisition of more skills than are taught in the early years of formal schooling: literacy, numeracy, and other cognitive and social abilities. As Halpern (1980:486) suggests, more years of schooling or better use of

the years of formal schooling should translate into more skills, and these in turn are related to lifetime incomes and are necessary for political participation. Furthermore, if these changes in the children are visible to the parents, and if the parents feel that such changes are desirable, then the parents themselves might be expected to allocate their resources differently to extend their children's schooling. They might do this by attempting to obtain private schooling; there are often nongovernmental schools in even the poorest *barrios* of Latin American urban areas, for example, and their costs are not out of reach if the parents are willing to make sacrifices. Alternatively, the parents might move to find schools, or simply become interested and seek a teacher for their children. All of these efforts are within the means of many poor families and might result in an extension of formal schooling.

The second way in which the short-term effects of preschool might extend to long-term effects is through the environment outside the school. Even accepting the idea that the cognitive effects of preschool are transitory, the social effects appear to be more lasting. On the assumption that cooperation in problem solving, verbal skills, emotional adjustment, and conduct could be permanently improved, these changes in the children should positively affect their success in any social or work activity. Changes such as these would then amount to significant improvements in the quality of human capital.

Other possible effects of preschool have been noted that might alleviate the causes of early dropout from school. Although these potential effects are beyond the scope of this article, they are summarized here briefly because some of them are not unrelated to the effects noted in the Perry project. Preschool may alter children's ability to cope with crowded schools and the consequent inadequate teacher attention to the individual needs of the children, it may provide the children with the necessary language or reasoning skills, and it may change parental expectations and prevent them from employing their children in the family business or encourage parents to make a special effort to send their children to school. Medical and nutritional care and secondary interventions related to early childhood education programs could prevent poor health and nutritional status at later ages. Finally, the availability of community support for families with preschool-age children should benefit both the children and their families.

The application of the findings of the Perry project to policies for early childhood education in developing nations rests on two bases. The first

is that the risk of educational failure can be defined in local terms for low-income populations; the second, that the short-term impact of early childhood education can be extended to the long term even in the absence of universal formal primary education. If these two bases can be accepted, the findings of the Perry project and other preschool efforts in the United States can be taken, along with the pioneering efforts of Third World researchers and program developers, as evidence of the merits of early childhood education as a source of policy alternatives for increasing the value of each nation's human capital. In considering early education in this way, at least three opportunities merit recommendation:

(a) Early childhood education programs merit consideration in their own right in addition to formal schooling, as preventive interventions for children from specific populations at high risk of educational failure in local terms.

(b) Early education programs merit consideration in combination with primary screening and secondary intervention projects in the areas of nutrition and health and in combination with community child care projects and family support networks. Although significant effects with preventive implications can be obtained, perhaps most important are the synergistic effects at the personal, family, and community levels of combining these interventions with the same target populations.

(c) Early education approaches merit consideration when contemplating curriculum design and educational reform efforts in primary education. Primary education could benefit from adapting methods used in local preschools and from those used in other contexts. Changes in structuring the classroom setting, in the organization of the class day, and in the content of activities, without losing sight of primary objectives, could result in extending the impact of preschool to the primary classroom.

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