

THE HIGH/SCOPE PRESCHOOL CURRICULUM COMPARISON
STUDY THROUGH AGE 23¹

Lawrence J. Schweinhart and David P. Weikart

High/Scope Educational Research Foundation

Early Childhood Research Quarterly, 1997, 12 , 117-143.

Abstract

This study assesses the relative effects through age 23 on young participants born in poverty of the High/Scope, Direct Instruction, and traditional Nursery School preschool curriculum models. At ages 3 and 4, 68 children were randomly assigned to the models, which were implemented independently and to high standards, in 2½-hour classes 5 days a week and biweekly 1½-hour home visits. For a decade, virtually no curriculum group differences in intellectual and academic performance were found. In many areas, no statistically significant differences were found at age 15 or at age 23; however, a pattern of group differences in community behavior did emerge at age 15 and became more pronounced at age 23. At age 15 the Direct Instruction group reported committing 2½ times as many acts of misconduct as the High/Scope group. At age 23, compared to the other curriculum groups, the Direct Instruction group had three times as many felony arrests per person, especially those involving property crimes; 47% of the Direct Instruction group was treated for emotional impairment or disturbance during their schooling, as compared to only 6% of either of the other curriculum groups. These results are attributed to the emphasis on planning, social reasoning, and other social objectives in the High/Scope curriculum and the Nursery School curriculum, but not in the Direct Instruction curriculum. The results of this study do not consistently distinguish between the

¹ Author Note. We thank the Ford Foundation, the U.S. Administration on Children, Youth and Families, and an anonymous donor, who provided funding for this study at age 23; Van Loggins, who found and interviewed study participants; Helen Barnes, who coordinated data collection and processing; Anthony North, who helped analyze the data; Mark Feldkamp, David Tholen, and David Mackoff-Borisy, who collected data from crime records; Nancy Burandt, who coded and entered the data; Ann Epstein, who reviewed the report; and the reviewers for this journal. A more detailed report of this study (Schweinhart & Weikart, 1997) is available from the High/Scope Press. Correspondence should be sent to Lawrence J. Schweinhart, Research Division Chair, High/Scope Educational Research Foundation, 600 North River Street, Ypsilanti, MI 48198-2898. Copyright © 1997 by the High/Scope Educational Research Foundation.

long-term effectiveness of the High/Scope and traditional Nursery School curriculums, but the High/Scope curriculum model is more readily replicated because of its more precise definition. These findings argue against using Direct Instruction in preschool programs and for using a well-defined curriculum model based on child-initiated learning activities.

THE HIGH/SCOPE PRESCHOOL CURRICULUM COMPARISON STUDY THROUGH AGE 23

The High/Scope Preschool Curriculum Comparison study was designed in the late 1960s to assess which of three preschool curriculum models worked best for young children living in poverty. By the time they reached young adulthood, the hypothesis was that young people born in poverty would achieve greater success and manifest greater social responsibility if they had attended a High/Scope or traditional Nursery School preschool program than if they had attended a Direct Instruction preschool program. This hypothesis assumes critical importance in light of the findings of the High/Scope Perry Preschool study that young people born in poverty have greater educational and economic success and half the crime rate if they attend a high-quality preschool program than if they do not attend a preschool program and that such programs return seven dollars to taxpayers for every dollar invested (Schweinhart, Barnes, & Weikart, 1993). The question then becomes whether these benefits result equally from all curriculum approaches from some more than from others. This report addresses this question with data from a follow-up of the original study participants when they were 23 years old.

Previous Findings from this Study

Weikart and his colleagues began this study in 1967 to assess the relative effects of three diverse preschool curriculum models---High/Scope, Direct Instruction, and traditional Nursery School. Project staff employed a stratified random assignment procedure to assign 68 young children living in poverty in Ypsilanti, Michigan, to each of the preschool curriculum models, which they experienced for one or two school years at ages 3 and 4. Through age 10, the only curriculum group difference on intellectual tests was that the Direct Instruction group had a significantly higher mean IQ on the Stanford-Binet Intelligence Test (Terman & Merrill, 1960) than did the Nursery School group at the end of the preschool program at age 5 (Weikart, Epstein, Schweinhart, & Bond, 1978). This 10-point difference, however, was not so large as the

mean IQ increases for each of the curriculum groups---an overall average of 27 points after one year of the preschool programs, which diminished by 9 points during the subsequent six years, but held steady at 17 points or more above the baseline at ages 6, 7, and 10---a pattern of sustained improvement that contradicted the expected IQ fade-out. The conclusion from the study through age 10 was that well-implemented preschool curriculum models had about the same strong effects on children's intellectual and academic performance.

Quite a different picture emerged from the study through age 15, when the measurement of outcomes was expanded to include community behavior (Schweinhart, Weikart, & Larner, 1986b). The Direct Instruction group reported committing 2½ times as many acts of misconduct as the High/Scope group. In addition, the Direct Instruction group reported that they were not as well thought of by their families as were the other two curriculum groups and had fewer members who engaged in the positive social activities of playing ball or other sports.

The discovery of differential curriculum effects at age 15 served as both impetus and source of hypotheses for the study through age 23. Were these age-15 findings accidental, perhaps due to the study's methodological limitations? Direct Instruction proponents thought so (Bereiter, 1986; Gersten, 1986), raising a series of methodological issues to which Schweinhart, Weikart, and Larner (1986a) responded. The methodology of the age-23 follow-up reported in this article responds to these issues as well. Most importantly, in response to the critics' challenge to the validity of self-reported misconduct, the study through age 23 includes an examination of actual public arrest records. While neither self-reported misconduct nor arrest records alone provide a fully valid description of antisocial behavior, together they present the best description obtainable, capturing both its personal and social dimensions.

Curriculum Models

The curriculum models used in the study's preschool programs represent three distinct theoretical approaches to early childhood education, three visions of what early childhood education ought to be. As shown in Figure 1, these approaches differ with respect to the degree

of initiative expected of the child and the degree of initiative expected of the teacher---whether the child is primarily initiator or respondent and whether the teacher is primarily initiator or respondent (Weikart, 1972). Kohlberg and Mayer (1972) identified similar early childhood education traditions. In the programmed-learning approach, the child responds to the initiating teacher, while in the child-centered approach, the teacher responds to the initiating child. In the open-framework approach, child and teacher both initiate events at their own levels of responsibility, while in the custodial-care approach (not represented in this study), child and teacher both respond to the flow of events, and the teacher's job is merely to keep the child safe and out of trouble.

--- Insert Figure 1 about here ---

The Direct Instruction curriculum model, developed by Bereiter and Engelmann (1966), represented the programmed-learning approach in this study. The model began with a preschool program devoted to behavioral learning principles, operated by Bereiter and Engelmann at the University of Illinois-Urbana in the mid-1960s. The model later expanded to Follow Through primary-grade programs and "DISTAR" materials published by Science Research Associates. The Direct Instruction program taught academic skills---specifically, the skills and content assessed by intelligence and achievement tests. Teachers led small groups of children in precisely planned, 20-minute, question-and-answer lessons in language, mathematics, and reading. Teachers' guides and children's workbooks were the only materials in the classroom because they were considered the only materials that stimulated the requisite learning.

The Nursery School curriculum model, encompassing what was traditionally seen as good early childhood education (Sears & Dowley, 1963), represented the child-centered approach. It was originally called "unit-based" because the teachers organized class activities, discussions, and field trips around broad units or themes, such as community helpers, circus animals, and holidays. Within a permissive atmosphere, teachers expected children to show good manners, cooperate, and observe limits. Children had freedom to choose activities, move

from one activity to another, and interact with adults and peers. The emphasis was on developing social skills rather than intellectual skills.

The High/Scope curriculum model, developed by Weikart and his associates (Weikart, Rogers, Adcock, & McClelland, 1971; Hohmann, Banet, & Weikart, 1979; Hohmann & Weikart, 1995), represented the open-framework approach. Based on Piaget's constructivist theory of child development, adults engaged children as active learners and arranged their classrooms in discrete, well-equipped interest areas. Each day, children planned, carried out, and reviewed their own activities; engaged in small- and large-group activities; and spent time outdoors. Teachers facilitated intellectual, social, and physical key experiences in children's development. These key experiences represented the domains of children's initiative; social relations; creative representation; music and movement; language and literacy; and the logical and mathematical operations of classification, seriation, and number and their applications to space and time.

Preschool Curriculum and Adult Status

How could the High/Scope or Nursery School preschool curriculums improve adult success and social responsibility better than the Direct Instruction preschool curriculum? A parsimonious hypothesis is that, compared to the Direct Instruction curriculum, the High/Scope and Nursery School curriculums improve children's positive dispositions that lead to later success and away from later misconduct. Comparison of the processes in these curriculums suggests that the positive dispositions are those of planning and social reasoning.

Planning. Planning ability and initiative may mediate between the High/Scope and Nursery School curriculums and later success and social responsibility. In the High/Scope curriculum and, to a lesser extent, in the Nursery School curriculum, adults encourage children to take initiative, to select and plan their own activities, to be decision makers to the extent that their ages and abilities permit. Early childhood education can help children develop their ability to take initiative and make plans (Bronson, 1994), and this ability has been found to be a factor in school achievement (Cohen, Bronson, & Casey, 1995). Linking planning ability to social

responsibility, correctional programs that place an emphasis on participants' critical thinking and reasoning about their behavior have been found to effectively prevent crime (Andrews et al., 1990; Antonowicz & Ross, 1994).

Social reasoning. DeVries, Reese-Learned, and Morgan (1991) found that children experiencing constructivist preschool education evidence better sociomoral action and reasoning than do children experiencing preschool Direct Instruction. DeVries and her associates systematically observed three kindergarten classes---one used Direct Instruction; another used a constructivist approach similar to High/Scope's; and the third was eclectic. Analyzing teachers' interactions with children, they found that the constructivist teacher significantly surpassed the other two in her use of reciprocal and collaborative negotiation strategies and shared experiences (DeVries, Haney & Zan, 1991). They found that during two game-like activities, the children from the constructivist class were more interpersonally interactive, with a greater number and variety of negotiation strategies and shared experiences than children from the other two classes (DeVries, Reese-Learned, & Morgan, 1991). DeVries (1991) offered an explanation of her results that apply, by extension, to this study:

When we unilaterally focus on giving children information, we are also communicating "lessons" about human relations. In the process we are creating the context for construction of interpersonal habits, personality, and character. Our study (DeVries, Reese-Learned, & Morgan, 1991) suggests that when children experience a heavily unilateral atmosphere, their sociomoral action and underlying reasoning are less advanced than when children experience a more reciprocal atmosphere. (DeVries, 1991, p. 546)

Other Preschool Curriculum Studies

The High/Scope Preschool Curriculum Comparison study stands at the beginning of a collection of studies examining the relative merits of various early childhood curriculum models. Three preschool curriculum comparison studies begun in the 1960s focused on children living in

poverty and included both Direct Instruction and traditional Nursery School programs---the study reported here, the University of Louisville study of Head Start (Miller & Dyer, 1975; Miller & Bizzell, 1983), and the University of Illinois study (Karnes, Teska, & Hodgins, 1970; Karnes, Schwedel, & Williams, 1983). All three studies found that children in Direct Instruction programs significantly outperformed children in traditional and other programs on various measures of intellectual performance during the program and up to a year afterwards. The widely observed pattern of IQ improvement followed by fade-out applied to all of these preschool programs. In the Illinois study, however, the high school graduation rates were noticeably if not significantly different---70% for the traditional program group, 48% for the Direct Instruction group, and 47% for the no-program group.

The national evaluation of the 1969-72 Planned Variation Head Start project included a dozen preschool curriculum models at 37 sites with some 6,000 children enrolled in model programs (Bissell, 1971; Datta, McHale, & Mitchell, 1976; Smith, 1973; Weisberg, 1973). Among its models were the Direct Instruction model, the High/Scope model, and an “Enabler model” that resembled the traditional Nursery School model. Despite the study’s many design problems, two clear findings emerged. First, children in Direct Instruction and other programmed-learning programs had the highest scores of all the program and comparison groups on the achievement tests given at the end of the preschool program. Second, children in High/Scope programs had the greatest gains in intellectual performance of all the program and comparison groups---an average 23 points gained on the Stanford-Binet Intelligence Scale as compared to average gains for children in other models of no more than 5 points.

The evidence continues to accumulate that early childhood curriculum models differ significantly in some of their effects on children (e.g., Burts et al., 1992; Marcon, 1992, 1994). This study through age 23 is part of the resultant effort to more precisely identify how curriculum differences affect children differently and how important and extensive these differences are.

Methodology

This study began with 68 3- and 4-year-olds of low socioeconomic status and high risk of school failure who were randomly assigned to three curriculum groups.

Sample Selection

As previously described (Weikart et al., 1978; Schweinhart et al., 1986b), the study sample consisted of 68 children who lived in Ypsilanti, Michigan; became 3 years old in 1967, 1968, or 1969; lived in families of low socioeconomic status; and had low scores on the Stanford-Binet Intelligence Scale (Terman & Merrill, 1960) at age 3. Ypsilanti had a population in 1969 of 29,538---80% European-American and 20% African-American (U.S. Bureau of the Census, 1972). The median income of the Ypsilanti population in 1969 was \$10,710, with 27% living in poverty (the poverty threshold for a non-farm family of four in 1969 was \$3,743). The adult population in 1969 had completed a median 12.2 years of schooling, with 54% having graduated from high school.

The census of the Ypsilanti Public Schools was used to identify the pool from which children were selected for the study. Sample members attended the preschool programs at ages 3 and 4 from 1967 to 1970. In September of the years that these children turned age 3, school district staff asked the children's parents to complete a questionnaire identifying: (a) parents' occupations---the father in two-parent families or the mother in single-parent families coded from 1 to 5: unemployed, unskilled, semiskilled, skilled, or professional; (b) parents' highest year of schooling---the highest year completed by the mother in single-parent families or the mean of the highest years completed by both parents; and (c) the rooms per person in the household (given half the weight of the other two factors). Low-scoring families were judged to be living in poverty and eligible for the study sample. The 3-year-olds in these families who scored between 60 and 90 on the Stanford-Binet Intelligence Scale (Form L-M; Terman & Merrill, 1960) and had no evidence of physical disability were admitted to the study sample.

Several children in the initial sample pool were already attending other early childhood programs, so their parents declined to have them participate in the study. Several others dropped out of the preschool programs in the study because their families moved out of the district. Two children were later judged ineligible for the study because their parents had risen to a much higher socioeconomic level. The 68 children who met the entry criteria and completed the preschool programs served as the original study sample. The oldest class had 27 children in it; the next oldest had 19; and the youngest had 22. Table 1 lists the characteristics of the initial sample.

--- Insert Table 1 about here ---

Curriculum Groups

Annually, staff randomly assigned children to three groups, then reassigned several children from one group to another until the groups had similar percentages of Blacks and Whites, percentages of boys and girls, and mean Stanford-Binet IQ---essentially a group matching technique. Then each group was randomly assigned to a curriculum model. To avoid confounding the effects of different curriculum models within families, 9 of the 68 children were reassigned to the same curriculum group that their older siblings had attended.

As Table 1 shows, the three curriculum groups did not differ significantly (p less than .05, two-tailed) at program entry on the background characteristics of race, gender, mean socioeconomic status of families, family configuration, fathers' or mothers' employment rate, fathers' highest year of schooling, persons per household or per room, or mean Stanford-Binet IQ of the children. On average, the Nursery School group mothers attended school significantly longer than the High/Scope group mothers---a difference that serves as a bias against finding advantages for the High/Scope group over the Nursery School group. This difference, however, was counterbalanced by a similar but nonsignificant difference in the opposite direction in fathers' highest years of schooling. Further, when study participants at age 23 reported their

parents' highest years of schooling, curriculum groups did not differ significantly on either mothers' or fathers' highest years of schooling.

Common Characteristics of Program Operation

This study operated three high-quality preschool programs that differed only in the curriculum models employed. All three programs operated in the same context---the same school administrators and director, the same funding, and the same staff working conditions and salary schedule. All three programs had class sessions for children 2½ hours a day Monday through Friday and 1½-hour educational home visits by teachers to each mother and child every two weeks. Teachers used the curriculum model in the class sessions and home visits and demonstrated and explained it to parents so that they could use it with their children. Classes, meeting between 1967 and 1970, typically had 15 or 16 3- and 4-year-olds and two certified teachers, a ratio of one teacher to about 8 children.

Documentation

In addition to detailed descriptions of program activities by the curriculum supervisor and teaching staff, Weikart et al. (1978) reported three types of documentation of program operation. This documentation verifies that the three models were implemented as intended and in distinctly different ways:

- (a) Systematic observation of the programs using the Pupil Record of School Experience (PROSE; Medley, Schluck, & Ames, 1968) focused on individual children rather than the teacher. Observers using the PROSE found significant differences between programs which generally agreed with expected curriculum model differences.
- (b) 492 home visit reports---12 for each of 41 of the 68 children in the study---showed that the home visits reflected characteristics of the curriculum models being experienced by the children. Mothers participated in 80% of the scheduled

High/Scope and Direct Instruction home visits, but in only 50% of the scheduled Nursery School home visits.

- (c) Twelve national experts in early childhood education who visited the project during 1968 and 1969 wrote comments on the high degree of staff enthusiasm and commitment to the project and to the children. They wrote that the Direct Instruction program was faithful to the Bereiter-Engelmann model; that the High/Scope teachers adapted Piagetian ideas to the children's developmental levels and developed children's impulse control through the plan-do-review daily routine; and that the Nursery School program had frequent spontaneous interaction and that children persisted at tasks despite the lack of structure.

Because the teachers followed the curriculum models closely, and were observed to do so, it is reasonable to attribute any group differences in child outcomes to curriculum model differences rather than to idiosyncratic teacher differences.

Instrumentation and Data Collection

The High/Scope Preschool Curriculum Comparison study collected data annually from ages 3 to 8 and at ages 10, 15, and 23.

Age 23 interview. The age-23 interview, also used in the High/Scope Perry Preschool study through age 27 (Schweinhart et al., 1993), lasted 1½ - 2 hours and examined the characteristics of study participants reported in the results section, including literacy (APL Survey, American College Testing Program, 1976), sources of irritation (Freeberg, 1976), and self-reported misconduct (Bachman & Johnston, 1978). After each interview, the interviewer asked the respondent to sign consent forms for release of personal information from school, police, and social services records; and paid the respondent \$50. A long-time, well-known African-American resident of Ypsilanti found and interviewed study participants at ages 15 and 23. He had served as a high school coach and knew many of them. He found many of them by

obtaining information from their families and friends. He did not know the curriculum group membership of individual study participants.

--- Insert Table 2 about here ---

Table 2 lists the initial background characteristics of the 52 sample members interviewed at age 23. Except for age and home at age 23, these characteristics were measured at program entry, so that comparison of Table 1 and Table 2 indicates how the sample remaining at age 23 differed from the original sample. A key question for the analysis of the age-23 interview variables was whether those remaining in the curriculum groups differed significantly from each other on background characteristics. Just as at program entry, the curriculum groups remaining at age 23 differed only on mothers' highest year of schooling, in such a way as to bias comparisons of outcomes against the High/Scope group and in favor of the Nursery School group. Neither did the curriculum groups differ significantly on age at interview, with a mean age of 23.5 years for the sample interviewed, nor on residence at age 23, with 74% living in Washtenaw County (where the preschool programs took place), 14% living elsewhere in Michigan, and 12% living elsewhere in the country. Although the curriculum groups at age 23 did not differ significantly in gender makeup, 47% of the Direct Instruction group were males as compared to only 36% of the High/Scope group and 42% of the Nursery School group.

School records. With student permission (obtained at the age-23 interview for 37 cases or the age-15 interview for 9 additional cases), data were collected on 46 study participants from the general and special education records of the Ypsilanti Public Schools and other school districts in Washtenaw County---15 from the Direct Instruction group, 15 from the High/Scope group, and 16 from the Nursery School group. Comparison of the curriculum groups' background characteristics for the 46 sample members with school records data revealed the same results as for the 68 members of the original sample and for the 52 sample members with age-23 interview data: The only statistically significant difference was that the Nursery School

group mothers had a significantly higher mean highest year of schooling than the High/Scope group mothers.

Arrest records. Arrest records came from records searches in 1990 at the local juvenile court, circuit court, three district courts, Detroit Recorder Court, the Federal Court in Detroit, and the Michigan State Police computerized records system. Because local police departments transmit data to the State Police records, these records had nearly complete counts of arrests in the state, but incomplete counts of the charges and adjudications that followed arrests. Adult arrest records are available for public inspection without the permission of those arrested; however, the study participants who were interviewed had given their permission for these records' searches.

Unlike school records, for which missing records are simply missing data, missing arrest records signify the absence of arrests, "0" arrests, and we searched for the records of all 68 cases. However, study participants who were interviewed at age 23 in a state other than Michigan had a reduced chance of being arrested in Michigan; only 1 of the 6 had an adult arrest record in Michigan. So these 6 cases (2 in the Direct Instruction group, 3 in the High/Scope group, and 1 in the Nursery School group) were excluded from the arrest records sample. This left two categories of study participants---those interviewed at age 23 in Michigan and those not interviewed whose residence at age 23 was unknown. Of the study participants not interviewed, 49% (8 of 19) had adult arrest records, only slightly less than the 56% (24 of 43) of the interviewed Michigan residents who had adult arrest records. For this reason, the 19 study participants who were not interviewed were retained in the arrest records sample; of these, 1 of 4 Direct Instruction group members, 3 of 8 High/Scope group members, and 1 of 7 Nursery School group members had adult arrest records. Thus, the arrest records sample had 62 members---21 in the Direct Instruction group, 19 in the High/Scope group, and 22 in the Nursery School group.

Analysis of the background characteristics of the curriculum groups retained in the arrest records sample had the same results as the other analyses of background characteristics. Again,

the only statistically significant difference was that the Nursery School group mothers had a significantly higher mean highest year of schooling than the High/Scope group mothers.

Data Analysis Techniques

Initial curriculum group analyses were carried out without statistical adjustments because the groups had been randomly assigned and were quite similar to each other on background variables; a second analysis controlled for gender. Data analyses were conducted using SPSS for Windows, Version 6.1 (Norušis, 1993).

Analysis of variance was used to analyze continuous variables. Because of skewed distributions and unequal variances, each continuous variable was also analyzed with the Kruskal-Wallis H statistic corrected for ties, a procedure that uses the chi-square statistic to test differences in the mean ranks of groups. These parametric and nonparametric procedures usually agreed in their conclusions regarding whether curriculum group differences on a variable were statistically significant (at $p < .05$, two-tailed), indicating that analysis of variance results were not due to outliers or other violations of assumptions for parametric analyses. Only the analysis-of-variance results are presented except for variables in which discrepant findings were obtained. For these variables, the mean ranks and p -value based on the Kruskal-Wallis H analysis are presented as well. Chi-square analysis was used to analyze categorical variables.

Findings

Findings are presented for curriculum-group differences through age 23 in education, household and income, community activities, and criminal arrests.

Education

As Table 3 shows, the High/Scope group significantly surpassed the Direct Instruction group in highest year of schooling planned. However, curriculum groups did not differ significantly in their self-reported highest year of schooling, on-time high school graduation rate, high school graduation/GED rate, or post-high school education.

--- Insert Table 3 about here ---

Table 3 also presents information from school records. The Direct Instruction group experienced significantly more years of special education for emotional impairment or disturbance than either of the other two groups; 47% of the Direct Instruction group were identified at some time as emotionally impaired or disturbed, as compared to only 6% of the High/Scope group and 6% of the Nursery School group. Combining treatment for emotional impairment or disturbance with treatment for educable mental impairment and treatment for specific learning disabilities, 80% of the Direct Instruction group, 53% of the High/Scope group, and 44% of the Nursery School group received some sort of special education at some time during their schooling.

While this study did not have an untreated control group, the High/Scope Perry Preschool study did, as part of a sample selected by the same criteria in the same town just before this study began (Schweinhart et al., 1993). In that study, the program group received treatment for emotional impairment or disturbance an average of 0.5 years, while the untreated control group received such treatment for an average of 0.7 years. In the Curriculum study, the Direct Instruction group's average of 1.1 years was considerably higher than either of these numbers, while the average of 0.1 years for the High/Scope group and the Nursery School group was considerably lower than either of them, suggesting that the Direct Instruction program may have led to an increase in emotional impairment or disturbance while the High/Scope and Nursery School programs led to a decrease.

In contrast, the High/Scope group experienced significantly more years of compensatory education (for low-income, low-achieving students) than did the Nursery School group, with 33% of the High/Scope group, 20% of the Direct Instruction group, and 0% of the Nursery School group receiving compensatory education at some time. One might suppose that compensatory education served as a less expensive alternative to special education for those students requiring some sort of special treatment. However, in this sample, the only students

receiving compensatory education were those who also received special education at some other time during their schooling.

No statistically significant group differences in literacy test scores were found at age 23.

--- Insert Table 4 about here ---

Household, Income, and Community Activities

Age 23 is at the beginning of adult life and in this study appears to be a transitional period: As shown in Table 4, 47% of the respondents were still living with their parents and 53% were not. Curriculum groups differed significantly in the percentages of members married and living with their spouses: 0% of the Direct Instruction group, as compared to 18% of the Nursery School group and 31% of the High/Scope group. As Table 4 shows, curriculum groups did not differ significantly in their employment rates during the previous five years or currently, monthly earnings, monthly income from all sources, or months on welfare in the previous ten years, although the High/Scope group's employment rate was noticeably lower than those of the other curriculum groups.

As shown in Table 5, curriculum groups differed significantly on various positive and negative community activities. Significantly more High/Scope and Nursery School group members than Direct Instruction group members had ever done volunteer work. About three times as many High/Scope group members as Direct Instruction or Nursery School group members had voted in the last Presidential election.

--- Insert Table 5 about here ---

The Direct Instruction group identified significantly more sources of irritation (the interview item read "types of people . . . giving you a hard time lately") than did the High/Scope group. The most frequent sources of irritation for these sample members, in order of frequency, were collection agencies, work supervisors, police, courts, and family members.

As previously reported, at age 15 the High/Scope group reported committing significantly fewer acts of misconduct than did the Direct Instruction group (Schweinhart et al., 1986b). The

High/Scope group reported committing an average of 5.9 acts of misconduct on an 18-item scale as compared to the 14.9 acts of misconduct reported by the Direct Instruction group.² When the same scale was used in the High/Scope Perry Preschool study at age 15, the program group reported an average of 5.2 acts of misconduct and the no-program group reported an average of 7.1 acts of misconduct, suggesting that the Direct Instruction group in the Curriculum study may have committed twice as many acts of misconduct as they would have had they not attended any preschool program.

As shown in Table 5, the mean rank on acts of misconduct reported at age 23 was significantly lower for the High/Scope group than for the Nursery School group, an instance in which the variable did not meet the assumptions for analysis of variance and the appropriate, nonparametric analysis was used. Thus, the age-15 misconduct difference between the High/Scope and Direct Instruction group was not corroborated by another self-report measure at age 23. The mean rank for the Direct Instruction group on being suspended from work was significantly greater than the comparable figure for the Nursery School group: 27% of the Direct Instruction group as compared to 0% of the Nursery School group had ever been suspended from work.

--- Insert Table 6 about here ---

Criminal Arrests

As shown in Table 6, the Direct Instruction group had significantly more felony arrests than the other curriculum groups---three times as many as either of the other curriculum groups. These differences appeared in felony arrests from ages 22 onward, as their number grew more substantial. Overall, 39% of the Direct Instruction group members had felony arrest records as compared to 10% of the High/Scope group and 17% of the Nursery School group. These

²These numbers differ from those reported by Schweinhart et al. (1986) because the scaling was recalibrated: “3 or 4 times” was coded as 3.5 instead of 3, and “5 or more times” was coded as 5 instead of 4.

findings corroborate the findings on self-reported misconduct at age 15, triangulating on the relative prevalence of crime by these curriculum groups.

The Direct Instruction group averaged 0.9 felony arrests as compared to 0.2 for the High/Scope group and 0.3 for the Nursery School group. In the High/Scope Perry Preschool study, the estimated average felony arrests by age 23 were 0.7 for the program group and 1.5 for the no-program group (Schweinhart et al., 1993). This comparison suggests that the Direct Instruction program did not lead to more felony arrests than no preschool program would have, but neither did it lead to fewer felony arrests than no preschool program, as the other preschool programs did.

As Table 6 shows, the Direct Instruction group had significantly more arrests for property crimes---such as breaking and entering, larceny, vehicle theft, and malicious destruction of property---than the High/Scope group. Curriculum groups did not differ significantly in arrests for violent crimes or crimes involving drugs. Regarding specific types of crimes, the Direct Instruction group was cited significantly more than the other curriculum groups for assault with a dangerous weapon (19% vs. 0% vs. 0%, $n = 62$, $p = .015$).

In his critique of this study's findings through age 15, Bereiter (1986) suggested that the curriculum group difference in misconduct might be due to the fact that the first cohort of 8 members of the Direct Instruction group (and 8 members of the Nursery School group) attended only one year of the preschool program while all of the High/Scope group attended for two years. To see if the shorter preschool programs influenced the curriculum group difference in felony arrests, the analysis was conducted with the subsample who attended their preschool programs for two years. In the two-year subsample, the mean number of felony arrests for each of the three curriculum groups was almost exactly the same as it was in the complete arrest sample.

Curriculum-by-Gender Analyses

In a sample of this size, it is possible that nonsignificant differences in the gender makeup of curriculum groups might account for apparent curriculum group differences, especially with regard to misconduct and arrests. To examine this possibility, we conducted curriculum-group-by-gender analyses of variance on the 13 variables for which statistically significant group differences were reported. Ten of these variables continued to manifest a statistically significant curriculum group difference: years of identified emotional impairment or disturbance, times suspended from work, highest year of schooling planned, sources of irritation, misconduct at age 15, felony arrests, felony arrests at ages 22 and over, property crimes, living with spouse at age 23, and ever done volunteer work. Thus, the majority of the findings were unaffected by the gender makeup of the curriculum groups.

The curriculum group differences found for the remaining three variables did not remain when analyzed with curriculum-group-by-gender analyses of variance---years of compensatory education, misconduct at age 23, and voting in the last Presidential election. For these variables, it seems that the apparent curriculum group differences were due to differences in the groups' gender makeup rather than their preschool curriculum experience. These three variables include the only two variables on which the High/Scope group and the Nursery School group had differed significantly---years of compensatory education misleadingly favoring the Nursery School group and misconduct through age 23 misleadingly favoring the High/Scope group. With gender included in the analysis, this study found no statistically significant differences between the High/Scope and Nursery School groups.

Examination of curriculum-by-gender subgroup means and percentages reveals that Direct Instruction males were worse off than any of the other subgroups in various ways---years of identified emotional impairment or disturbance, times suspended from work, sources of irritation, felony arrests, felony arrest at ages 22 and over, and property crimes.

Mediating Variables

Evidence on mediating variables buttresses the plausibility of long-term group differences being due to curriculum models. Hypothesized mediating variables between preschool curriculum and adult social responsibility were children's positive dispositions and misconduct. Regarding positive dispositions, this study documented curriculum differences in the practices of fostering planning ability and social reasoning, but did not measure these outcomes in children. Regarding patterns of misconduct, the study measured and found curriculum group differences in years of treatment for emotional impairment or disturbance during schooling from kindergarten onward, self-reported misconduct at age 15, and felony arrests through age 23. Further evidence that emotional impairment/disturbance and misconduct at age 15 mediated between preschool curriculum models and felony arrests were the Pearson correlation coefficients between them: Felony arrests were correlated .54 with years of emotional impairment ($p < .001$, $n = 46$) and .30 with self-reported misconduct at age 15 ($p = .026$, $n = 54$).

Discussion

The interpretation of the findings and implications of this study revolve around two comparisons: first, Direct Instruction versus the other two curriculum models; and second, the High/Scope model versus the Nursery School model. While statistically significant curriculum group differences were not found for most variables, ten such differences were found and remained after the groups' gender makeup was taken into account. All of them favored the High/Scope group, the Nursery School group, or both over the Direct Instruction group:

- The High/Scope group had advantages over the Direct Instruction group in highest year of schooling planned, higher percent living with spouse, fewer sources of irritation, less self-reported misconduct at age 15, fewer felony arrests, and fewer arrests for property crimes.
- The Nursery School group had advantages over the Direct Instruction group in fewer suspensions from work and fewer felony arrests at age 22 and over.

- Both High/Scope and Nursery School groups had advantages over the Direct Instruction group in experiencing fewer years of identified emotional impairment or disturbance and in ever doing volunteer work.

On no variable did the Direct Instruction group have an advantage over either the High/Scope group or the Nursery School group. On no variable did the High/Scope group have an advantage over the Nursery School group, and on no variable did the Nursery School group have an advantage over the High/Scope group.

Preschool Direct Instruction Did Not Prevent Crime

With nearly half of its members requiring treatment for emotional impairment or disturbance and with three times as many felony arrests, the Direct Instruction group, especially the males in this group, did not fare as well in the long run as the other curriculum groups. Unlike the High/Scope and Nursery School approaches, Direct Instruction focused on academic objectives, not on planning or social objectives. This strategy does not appear to have been in the best interests of the children served. This issue persists because of continuing demands from some parents, administrators, and policymakers that early childhood teachers use direct instructional strategies rather than child-initiated-learning strategies. Such demands have been the reason that the National Association for the Education of Young Children (NAEYC) has seen fit to issue, and recently reissue, a position statement on developmentally appropriate practice (Bredekamp, 1987; Bredekamp & Copple, 1997). Despite this clearly taken position, on a recent survey of a random sample of NAEYC members, 13% of respondents said they used Direct Instruction in their classrooms (Epstein, Schweinhart, and McAdoo, 1996).

Future research should examine the generalizability of this study's findings. Can preschool programs based on child-initiated learning activities help prevent crime in all children, or only in children born in poverty or otherwise at risk of school failure? Do these findings apply only to preschool programs or do they apply as well to educational programs for children in kindergarten and older? Early elementary Direct Instruction appears to have had beneficial

effects on children's schooling at some sites (Gersten & Keating, 1987), but does it represent a missed opportunity for the early prevention of misconduct and crime, even in early elementary school? In this study, could the Direct Instruction program have been modified so that it did not purchase a short-term advantage in intellectual performance at the expense of preventing long-term misconduct and crime? Is highly scripted Direct Instruction (the model used in this study) more or less effective in preventing misconduct and crime than the unscripted direct instruction that is more commonly used in schools today? This study prompts the serious debate and empirical study of these questions.

Curriculum Models and Program Quality

This study suggests that specific curriculum models based on child-initiated learning activities are essential if preschool programs are to produce lasting benefits. In the recent survey of NAEYC members (Epstein et al., 1996), 33% of the respondents espoused a particular curriculum model of some kind; 46% said they blended ideas from several curriculum models; and 21% said they used no curriculum model. Those who do not espouse a particular curriculum model do not have a firm basis on which to generalize the findings of studies such as this one to their own programs.

Teachers who want to achieve the effects found for a curriculum model must commit themselves to use the curriculum model to guide their educational decisions. Research findings for program effects can only be generalized to programs that are essentially the same as the programs studied. Using a curriculum model does not require the abandonment of intelligent judgment, as some have suggested (Goffin, 1993; Walsh, Smith, Alexander, & Ellwein, 1993). Situations in preschool programs are constantly changing, and teachers must apply principles intelligently to these situations, or the principles are reduced to mindless reactions. On the other hand, while this study suggests that conventional early childhood wisdom is on the right track, it hardly substantiates every idea that a good early childhood teacher ever had. Compared to the

broadly defined Nursery School tradition, the High/Scope curriculum model is more precisely defined, better documented, and therefore easier to replicate.

This study should dispel the belief that substantial outreach to parents, regardless of content or objectives, makes the difference between programs that have lasting success and those that do not. Biweekly home visits were as much a part of the Direct Instruction program as they were of the others. But this study does support the belief that substantial outreach to parents is a major vehicle by which a curriculum model can achieve its lasting benefits. Because parents were treated as full partners in the implementation of these curriculum models with their children, it is reasonable to believe that the parents of Direct Instruction group children focused on direct teaching of academic skills while parents of the High/Scope and Nursery School group children learned to observe and extend their children's development and decision-making capacity. In this way, parents as well as teachers may have led children to shift their behavior in ways that led to the striking long-term group differences.

This study has the disadvantages of a small sample as well its advantages. The disadvantages have to do with possible limitations in the generalizability of the children in the sample to all children living in poverty and the generalizability of the curriculum models implemented in the study to all implementations of these curriculum models. The 68-member sample spent much or all of their lives in Ypsilanti, Michigan, experiencing its particular schools, police, and social climate, which may differ in crucial ways elsewhere. Despite the initial similarity of curriculum groups, some group differences in long-term outcomes may be due to differences in background characteristics rather than curriculum experience, as the group-by-gender analyses show. Finally, the three curriculum models vary in practice much more than they varied in the study. Only two to five teachers implemented each curriculum model, making it possible, despite the careful control, that teachers' curriculum implementation styles could have affected the programs. For all of these reasons, the study findings must be viewed as suggestive rather than definitive.

On the other hand, the small size of the study permitted a seldom-achieved tight experimental design and control of program quality. Larger curriculum comparison studies, such as Planned Variation Head Start, have been fraught with problems of design and wide variations in program quality (e.g., Weisberg, 1973). Also, statistical analyses are designed to take small sample instability into account. To achieve statistical significance, group differences must be larger in small samples than in large samples. Thus, when group differences are found to be statistically significant in a small sample, these differences are of considerable magnitude. Witness that the statistically significant finding of a difference in felony arrests in this study required three times as many felony arrests in one group as in the other two.

This study supports the preventive value of early childhood education based on child-initiated learning activities over early childhood education based on scripted teacher-directed instruction. It identifies the High/Scope Curriculum and a particular traditional Nursery School approach as methods of preschool education that develop children's initiative, planning ability and social reasoning---the requisite skills and dispositions to become responsible adults. It supports the position that use of a defined curriculum model based on child-initiated learning activities is an essential part of the definition of quality in early childhood education.

References

- American College Testing Program. (1976). User's guide: Adult APL Survey. Iowa City, IA: Author.
- Andrews, D. A., Zinger, I., Hoge, R. D., Bonta, J., Gendreau, P., & Cullen, F. T. (1990). Does correctional treatment work? A clinically-relevant and psychologically-informed meta-analysis. Criminology, 28, 369-404.
- Antonowicz, D. H., & Ross, R. R. (1994). Essential components of successful rehabilitation programs for offenders. International Journal of Offender Therapy and Comparative Criminology, 38, 97-104.
- Bachman, J. G., & Johnston, J. (1978). The Monitoring the Future questionnaire. Ann Arbor, MI: University of Michigan, Institute for Social Research.
- Bereiter, C. (1986). Does Direct Instruction cause delinquency? Early Childhood Research Quarterly, 1, 289-292.
- Bereiter, C., & Engelmann, S. (1966). Teaching the disadvantaged child in the preschool. Englewood Cliffs, NJ: Prentice-Hall.
- Bredenkamp, S. (Ed.). (1987). Developmentally appropriate practice in early childhood programs serving children from birth through age 8. Washington, DC: National Association for the Education of Young Children.
- Bredenkamp, S. & Copple, C. (Eds.). (1997). Developmentally appropriate practice in early childhood programs. Rev. ed. Washington, DC: National Association for the Education of Young Children.
- Bissell, J. S. (1971). Implementation of planned variation in Head Start. Washington, DC: U.S. Department of Health, Education, and Welfare, Office of Child Development.
- Bronson, M. B. (1994). The usefulness of an observational measure of children's social and mastery behaviors in early childhood classrooms. Early Childhood Research Quarterly, 9, 19-43.

- Burts, D. C., Hart, C. H., Charlesworth, R., Fleege, P. O., Mosley, J., & Thomasson, R. H. (1992). Observed activities and stress behaviors of children in developmentally appropriate and inappropriate kindergarten classrooms. Early Childhood Research Quarterly, 7, 297-318.
- Cohen, G. N., Bronson, M. B., & Casey, M. B. (1995). Planning as a factor in school achievement. Journal of Applied Developmental Psychology, 16, 405-428.
- Datta, L., McHale, C., & Mitchell, S. (1976). The effects of Head Start classroom experience on some aspects of child development: A summary report of national evaluations, 1966-1969. (DHEW Publication No. OHD-76-30088). Washington, DC: U. S. Government Printing Office.
- DeVries, R. (1991). The eye beholding the eye of the beholder: Reply to Gersten. Early Childhood Research Quarterly, 6, 539-548.
- DeVries, R., Haney, J. P., & Zan, B. (1991). Sociomoral atmosphere in direct-instruction, eclectic, and constructivist kindergartens: A study of teachers' enacted interpersonal understanding. Early Childhood Research Quarterly, 6, 449-471.
- DeVries, R., Reese-Learned, H., & Morgan, P. (1991). Sociomoral development in direct-instruction, eclectic, and constructivist kindergartens: A study of children's enacted interpersonal understanding. Early Childhood Research Quarterly, 6, 473-517.
- Epstein, A. S., Schweinhart, L. J., & McAdoo, L. (1996). Models of early childhood education. Ypsilanti, MI: High/Scope Press.
- Freeberg, N. E. (1976). Criterion measures for youth-work training programs: The development of relevant performance dimensions. Journal of Applied Psychology, 61, 537-545.
- Gersten, R. (1986). Response to "Consequences of three preschool curriculum models through age 15." Early Childhood Research Quarterly, 1, 293-302.
- Gersten, R. & Keating, T. (1987). Improving high school performance of "at-risk" students: A study of long-term benefits of direct instruction. Educational Leadership, 44(6), 28-31.

- Goffin, S. G. (1993). Curriculum models and early childhood education: Appraising the relationship. New York: Merrill.
- Hohmann, M., Banet, B., & Weikart, D. P. (1979). Young children in action: A manual for preschool educators. Ypsilanti, MI: High/Scope Press.
- Hohmann, M., & Weikart, D. P. (1995). Educating young children: Active learning practices for preschool and child care programs. Ypsilanti, MI: High/Scope Press.
- Karnes, M. B., Schwedel, A. M., & Williams, M. B. (1983). A comparison of five approaches for educating young children from low-income homes. In Consortium for Longitudinal Studies, As the twig is bent . . . lasting effects of preschool programs (pp. 133-170). Hillsdale, NJ: Erlbaum.
- Karnes, M. B., Teska, J. A., & Hodgins, A. S. (1970). The effects of four programs of classroom intervention on the intellectual and language development of four-year-old disadvantaged children. American Journal of Orthopsychiatry, 40, 58-76.
- Kohlberg, L. & Mayer, R. (1972). Development as the aim of education. Harvard Educational Review, 42, 449-496.
- Marcon, R. A. (1992). Differential effects of three preschool models on inner-city 4-year-olds. Early Childhood Research Quarterly, 7, 517-530.
- Marcon, R. A. (1994, November). Doing the right thing for children: Linking research and policy reform in the District of Columbia Public Schools. Young Children, 50(1), 8-20.
- Medley, D. M., Schluck, C. G., & Ames, N. P. (1968). Recording individual pupil experiences in the classroom: A manual for PROSE recorders. Princeton, NJ: Educational Testing Service.
- Miller, L. B., & Bizzell, R. P. (1983). The Louisville experiment: A comparison of four programs. In Consortium for Longitudinal Studies, As the twig is bent . . . lasting effects of preschool programs (pp. 171-199). Hillsdale, NJ: Erlbaum.

- Miller, L. B. & Dyer, J. L. (1975). Four preschool programs: Their dimensions and effects. Monographs of the Society for Research in Child Development, 40 (5-6, Serial No. 162).
- Norušis, M. J. (1993). SPSS for Windows: Base system user's guide, Release 6.0. Chicago: SPSS.
- Schweinhart, L. J., Barnes, H. V., & Weikart, D. P., with Barnett, W. S., & Epstein, A. S. (1993). Significant benefits: The High/Scope Perry Preschool study through age 27 (Monographs of the High/Scope Educational Research Foundation, 10). Ypsilanti, MI: High/Scope Press.
- Schweinhart, L. J., Weikart, D. P., & Larner, M. B. (1986a, September). Child-initiated activities in early childhood programs may help prevent delinquency. Early Childhood Research Quarterly, 1, 303-312.
- Schweinhart, L. J., & Weikart, D. P. (1997). Lasting differences: The High/Scope Preschool Curriculum Comparison study through age 23 (Monographs of the High/Scope Educational Research Foundation, 12). Ypsilanti, MI: High/Scope Press.
- Schweinhart, L. J., & Weikart, D. P., & Larner, M. B. (1986b). Consequences of three preschool curriculum models through age 15. Early Childhood Research Quarterly, 1, 15-45.
- Sears, P. S., & Dowley, E. M. (1963). Research on teaching in the nursery school. In N. L. Gage (Ed.), Handbook of research on teaching. Chicago: Rand McNally.
- Smith, M. S. (1973). Some short-term effects of project Head Start: A preliminary report on the second year of planned variation, 1970-71. Cambridge, MA: Huron Institute.
- Terman, L. M., & Merrill, M. A. (1960). Stanford-Binet Intelligence Scale, Form L-M: Manual for the third revision. Boston, MA: Houghton-Mifflin.
- U.S. Bureau of the Census. (1972). Census of population and housing: 1970, Census tracts, Ann Arbor, Mich., Standard Metropolitan Statistical Area. Final report PH(1)-11. Washington, DC: U.S. Government Printing Office.

- Walsh, D. J., Smith, M. E., Alexander, M., & Ellwein, M. C. (1993). The curriculum as mysterious and constraining: Teachers' negotiations of the first year of a pilot programme for at-risk 4-year-olds. Journal of Curriculum Studies, 25, 317-332.
- Weikart, D. P. (1972). Relationship of curriculum, teaching, and learning in preschool education. In J. C. Stanley (Ed.), Preschool programs for the disadvantaged. Baltimore, MD: Johns Hopkins University Press.
- Weikart, D. P., Epstein, A. S., Schweinhart, L. J., & Bond, J. T. (1978). The Ypsilanti Preschool Curriculum Demonstration Project: Preschool years and longitudinal results. (Monographs of the High/Scope Educational Research Foundation, 4). Ypsilanti, MI: High/Scope Press.
- Weikart, D. P., Rogers, L., Adcock, C., & McClelland, D. (1971). The Cognitively Oriented Curriculum: A framework for preschool teachers. Urbana, IL: University of Illinois.
- Weisberg, H. I. (1973). Short-term cognitive effects of Head Start programs: A report on the third year of planned variation--1971-72. Cambridge, MA: Huron Institute.

Table 1
Background Characteristics of the Original Study Participants

Characteristic	All	Direct Instruction	High/Scope	Nursery School	p
Number of study participants	68	23	22	23	
First cohort	27	8	11	8	
Second cohort	19	7	5	7	
Third cohort	22	8	6	8	
African-Americans	65%	65%	77%	52%	–
Females	54%	52%	59%	52%	–
Family socioeconomic status ^a (\underline{n} = 67)	8.8 (1.1)	8.7 (1.0)	9.0 (1.3)	8.9 (1.0)	–
Single-parent families (\underline{n} = 65)	32%	35%	40%	23%	–
Fathers employed (\underline{n} = 48)	98%	93%	100%	100%	–
Mothers employed (\underline{n} = 66)	33%	44%	25%	29%	–
Fathers' highest year of schooling (\underline{n} = 51)	9.0 (2.2)	9.2 (1.6)	9.6 (1.7)	8.4 (2.9)	–
Mothers' highest year of schooling (\underline{n} = 66)	10.0 (1.9)	9.7 (1.7)	9.3* (2.4)	10.9* (1.2)	.017
Persons per household (\underline{n} = 65)	6.7 (2.6)	6.8 (2.1)	6.1 (2.5)	7.1 (3.1)	–
Persons per room (\underline{n} = 65)	1.1 (0.4)	1.2 (0.4)	1.0 (0.4)	1.2 (0.4)	–
Child Stanford-Binet IQ at program entry	78.3 (6.8)	78.8 (7.0)	77.5 (7.0)	78.6 (6.8)	–

Note.---Unless otherwise indicated, \underline{n} of the original sample = 68. The chi-square statistic tests differences in percents; the analysis of variance tests differences in means (followed by standard deviations in parentheses). The associated p-value is reported if less than .05. One group value in a row is starred if different from the other two at $p < .05$; two group values in a row are starred if different from each other at $p < .05$.

^aThe socioeconomic status scale combines factors of mother's and father's employment and schooling and persons per room.

Table 2
Background Characteristics of the Study Participants Interviewed at Age 23

Characteristic	Direct Instruction	High/Scope	Nursery School	p
Number of study participants	19	14	19	
First cohort	6	9	7	
Second cohort	5	2	6	
Third cohort	8	3	6	
African-Americans	68%	86%	63%	–
Females	53%	64%	58%	–
Family socioeconomic status ^a ($\underline{n} = 67$)	8.7 (1.1)	8.8 (1.5)	8.8 (1.1)	–
Single-parent families ($\underline{n} = 65$)	32%	42%	28%	–
Fathers employed ($\underline{n} = 48$)	100%	100%	100%	–
Mothers employed ($\underline{n} = 66$)	42%	21%	35%	–
Fathers' highest year of schooling ($\underline{n} = 51$)	10.5 (1.9)	9.3 (1.7)	8.7 (3.2)	–
Mothers' highest year of schooling ($\underline{n} = 66$)	9.8 (1.7)	9.0* (2.6)	10.8* (1.2)	.029
Persons per household ($\underline{n} = 65$)	6.9 (2.2)	6.5 (2.8)	7.6 (3.3)	–
Persons per room in household ($\underline{n} = 65$)	1.2 (0.5)	1.1 (0.4)	1.3 (0.4)	–
Child Stanford-Binet IQ	78.5 (7.1)	78.4 (7.7)	77.8 (7.1)	–
Age at age-23 interview ($\underline{n} = 52$)	23.2 (1.0)	23.7 (0.8)	23.8 (1.4)	–
Home at age 23 ($\underline{n} = 50$)				
Washtenaw County	90%	64%	65%	–
Rest of Michigan	0%	14%	29%	
Rest of U.S.	11%	21%	6%	

Note.—Unless otherwise indicated, $\underline{n} = 68$. Variables were collected at program entry unless age 23 is mentioned. The chi-square statistic tests differences in percents; the analysis of variance tests differences in means (followed by standard deviations in parentheses). The associated p-value is reported if less than .100. One group value in a row is starred if different from the other two at $p < .05$; two group values in a row are starred if different from each other at $p < .05$.

^aCombines factors of mother's and father's employment and schooling and persons per room.

Table 3
Schooling

Characteristic	Direct Instruction	High/Scope	Nursery School	p
<u>Self-report</u>				
Highest year of schooling ($\underline{n} = 51$) ^a	12.2 (2.0)	12.4 (1.7)	12.7 (1.7)	–
On-time high school graduation ($\underline{n} = 51$)	47%	64%	72%	–
High school graduation/GED ($\underline{n} = 51$)	58%	71%	78%	–
Any post-high school education/training ($\underline{n} = 50$)	61%	77%	79%	–
Highest year of schooling planned ^a ($\underline{n} = 51$)	14.1* (2.2)	16.3* (1.8)	15.1 (2.2)	.020
Bachelor's degree or more planned ($\underline{n} = 51$)	36%	70%	57%	
<u>School records</u>				
Years of special education ^b	1.9 (1.6)	2.1 (3.1)	1.7 (2.7)	–
1 - 2 years	47%	20%	13%	
3 - 10 years	33%	33%	31%	
Years of identified educable mental impairment	0.2 (0.6)	1.1 (2.9)	0.8 (2.3)	–
% ever identified as EMI	13%	13%	13%	
Years of identified emotional impairment or disturbance	1.1* (1.5)	0.1 (0.5)	0.1 (0.3)	.004
% ever identified as EI	47%	6%	6%	
Years of identified specific learning disability	0.3 (0.9)	0.6 (1.7)	0.4 (1.0)	–
% ever identified as LD	13%	13%	13%	
Years of compensatory education	0.3 (0.6)	0.6* (1.0)	0.0* (0.0)	.049
1 - 3 years	20%	33%	0%	
Years repeating a grade	0.3 (0.6)	0.5 (0.7)	0.3 (0.6)	–
% ever repeated a grade	20%	40%	19%	
Total number of classes failed	9.6 (7.0)	5.0 (5.5)	4.9 (4.9)	–
Days absent per school year	6.4 (4.2)	8.3 (4.5)	6.7 (7.0)	–

Note.--- $\underline{N} = 46$ unless otherwise indicated. The chi-square statistic tests differences in percents; the analysis of variance tests differences in means (followed by standard deviations in parentheses). The associated p-value is reported if less than .05. One group value in a row is starred if different from the other two at $p < .05$; two group values in a row are starred if different from each other at $p < .05$.

^aJunior high school = 9, some high school = 10.5, high school graduate or GED = 12, vocational training or community college = 12.5, 1 year of college = 13, 2-year college degree = 14, 2 or more years of college = 15, 4-year college degree = 16, master's degree = 18, doctoral degree = 20.

^b"Special education" combines self-contained classes, integrated classes, and speech and language support.

Table 4
Household and Income

Characteristic	Direct Instruction	High/Scope	Nursery School	<u>p</u>
Persons living in respondent's household (<u>n</u> = 49)				
Mother &/or father	53%	46%	41%	–
Other relatives	10%	0%	12%	–
Spouse	0%*	31%*	18%	.045
Cohabitant	21%	15%	18%	–
Roommate	16%	8%	0%	–
Alone	5%	0%	6%	–
Past and present pregnancies to females (<u>n</u> = 27)	1.8 (1.6)	0.8 (0.9)	1.2 (1.7)	–
0	33%	50%	50%	–
1-2	22%	50%	33%	
3-5	44%	0%	20%	
Ever employed during last 5 years	100%	100%	94%	–
Currently employed	79%	50%	72%	–
Monthly earnings from work (<u>n</u> = 48)	\$498 (\$324)	\$465 (\$445)	\$698 (\$477)	–
\$0	12%	31%	11%	
\$100 - \$500	35%	31%	33%	
\$501 - \$1,600	53%	39%	55%	
Monthly income from all sources (<u>n</u> = 38)	\$730 (\$691)	\$1,378 (\$1,005)	\$1,170 (\$876)	–
\$0	7%	0%	0%	
\$100 - \$1,000	71%	44%	60%	
\$1,001 - \$3,500	21%	56%	40%	
Months on welfare in last 10 years (<u>n</u> = 52)	13.3 (24.3)	9.3 (11.6)	13.7 (29.6)	–
1 - 12	16%	36%	21%	
13 - 60	16%	21%	11%	
61 - 108	5%	0%	10%	

Note.---N = 52 unless otherwise indicated. The chi-square statistic tests differences in percents; the analysis of variance tests differences in means (followed by standard deviations in parentheses). The associated p-value is reported if less than .05. One group value in a row is starred if different from the other two at p < .05; two group values in a row are starred if different from each other at p < .05.

Table 5
Positive Community Activities and Misconduct

Characteristic	Direct Instruction	High/Scope	Nursery School	p
Ever done volunteer work	11%*	43%	44%	.047
Registered to vote	37%	62%	56%	–
Voted in last Presidential election	21%	62%*	22%	.030
Voted in state or local election	5%	8%	29%	–
Sources of irritation (sum of 12 items; $r_V = .594$)	2.0* (2.0)	0.4* (0.6)	1.2 (1.2)	.014
0	32%	64%	37%	
1 - 2	32%	36%	47%	
3 - 7	37%	0%	16%	
Misconduct at 15 ^a (sum of 18 items, $r_V = .788$)	14.9* (14.7)	5.9* (6.1)	8.0 (9.1)	.036
<u>Mean rank</u>	32.8	24.1	25.6	–
0	28%	28%	33%	
1 - 10	17%	50%	39%	
11 - 20	17%	17%	17%	
21 - 55	39%	6%	6%	
Misconduct at 23 ^b (sum of 14 items, $r_V = .748$)	8.7 (9.0)	5.3 (7.4)	9.9 (6.6)	–
<u>Mean rank</u>	27.0	18.7*	31.8*	.049
0	11%	36%	5%	
1 - 10	58%	43%	58%	
11 - 20	21%	14%	32%	
21 - 38	11%	7%	5%	
Times suspended from high school	1.6 (1.5)	1.3 (1.3)	0.8 (1.0)	–
0	37%	29%	48%	–
1 - 2	32%	50%	42%	
3 or more	32%	21%	11%	
Ever expelled from high school	16%	7%	5%	–
Times suspended from work	0.6 (1.1)	0.1 (0.3)	0.0 (0.0)	–
<u>Mean rank</u>	30.4*	25.3	23.5*	.033
1	16%	7%	0%	
3 or more	11%	0%	0%	

Note.---N = 52 unless otherwise indicated. The chi-square statistic tests differences in percents; the analysis of variance tests differences in means (followed by standard deviations in parentheses); the Kruskal-Wallis H statistic tests differences in mean ranks (in italics) when this nonparametric procedure leads to a different conclusion from the parametric analysis. The associated p-value is reported if less than .05. One group value in a row is starred if different from the other two at $p < .05$; two group values in a row are starred if different from each other at $p < .05$.

^aBased on 18 items—scored 0 = 0, 1 = 1, 2 = 2, 3.5 = 3 - 4 (previously calibrated as 3.0), 5 = 5 or more times.

^bThe 14 items—scored 0 = 0, 1 = 1, 2 = 2, 3.5 = 3 - 4, 5 = 5 or more times—were: gotten into a serious fight at work or at school, involved in a family fight, in fight with a group of friends against another group, injured someone so they needed medical care, used a weapon to get something from a person, took something worth less than \$50, took something worth more than \$50, took car from someone outside your family, broke into a house or building, set fire to property, damaged property, smoked marijuana, and used other drugs. The Pearson correlation coefficient between self-reported misconduct at 15 and self-reported misconduct at 23 was .531 ($n = 42$, $p < .001$).

Table 6
Arrest Records

Variable	Direct Instruction	High/Scope	Nursery School	<i>p</i>
Lifetime arrests (juvenile and adult)	3.3 (4.2)	1.7 (2.7)	1.3 (2.6)	–
1 - 4	38%	37%	32%	
5 - 14	29%	16%	9%	
Adult arrests (felonies and misdemeanors)	3.0 (4.0)	1.2 (2.2)	1.1 (2.1)	–
1 - 4	33%	37%	32%	
5 - 12	24%	5%	9%	
Felony arrests	0.9 (1.3)	0.2 (0.7)	0.3 (0.8)	.040
1 - 2	22%	5%	13%	
3 - 4	17%	5%	4%	
Felony arrests at ages 17 - 21	0.2 (0.5)	0.1 (0.2)	0.3 (1.0)	–
1 - 2	19%	5%	9%	
3 - 4	0%	0%	5%	
Felony arrests at ages 22 and over	0.6* (1.0)	0.2 (0.7)	0.1* (0.3)	.037
1 - 2	29%	0%	9%	
3 - 4	5%	5%	0%	
Ever convicted of felony & sentenced to prison	14%	5%	9%	–
Misdemeanors	2.0 (3.0)	1.0 (1.7)	0.8 (1.4)	–
1 - 4	10%	21%	18%	
5 - 9	33%	16%	18%	
Property-crime arrests	0.9* (1.4)	0.0* (0.0)	0.2 (0.7)	.007
1 - 2	24%	0%	9%	
3 - 5	14%	0%	5%	
Violent crime arrests	0.4 (1.3)	0.1 (0.3)	0.2 (0.4)	–
1 - 2	14%	11%	18%	
3 - 6	5%	0%	0%	
Ever arrested for a drug-related-crime	10%	5%	5%	–
Juvenile arrests	0.4 (0.7)	0.5 (1.8)	0.2 (0.7)	–
1 - 8	24%	16%	9%	

Note.---*N* = 62. The chi-square statistic tests differences in percents; the analysis of variance tests differences in means (followed by standard deviations in parentheses); the Kruskal-Wallis *H* statistic tests differences in mean ranks (in italics) when this nonparametric procedure leads to a different conclusion from the parametric analysis. The associated *p*-value is reported if less than .05. One group value in a row is starred if different from the other two at *p* < .05; two group values in a row are starred if different from each other at *p* < .05.

Table 7

Curriculum by Gender Analyses of Outcomes Differing Significantly by Curriculum Group

Characteristic	Gender	Direct Instruction	High/Scope	Nursery School	Curriculum <i>p</i>	Gender <i>p</i>	Curriculum x Gender <i>p</i>
Years of identified emotional impairment or disturbance (<i>n</i> = 46)	Female	0.4	0.0	0.0	.001	.006	.032
	Male	2.0	0.3	0.1			
Ever identified for emotional impairment or disturbance	Female	25%	0%	0%			
	Male	71%	17%	14%			
Times suspended from work (<i>n</i> = 52)	Female	1.1	1.1	1.0	.039	–	–
	Male	2.0	1.0	1.0			
Ever suspended from work	Female	10%	11%	0%			
	Male	80%	0%	0%			
Years of schooling planned ^a (<i>n</i> = 44)	Female	13.5	16.7	15.1	.023	–	–
	Male	14.6	15.5	15.1			
Years of compensatory education (<i>n</i> = 46)	Female	0.4	0.4	0.0	–	–	–
	Male	0.1	0.8	0.0			
Sources of irritation (<i>n</i> = 52)	Female	1.3	0.4	1.0	.012	–	–
	Male	2.8	0.4	1.4			
Misconduct at 15 (<i>n</i> = 54)	Female	15.8	4.4	7.7	.042	–	–
	Male	14.2	8.4	8.3			
Misconduct at 23 (<i>n</i> = 52)	Female	5.0	2.4	7.3	–	.001	–
	Male	12.8	10.3	13.4			
Felony arrests (<i>n</i> = 62)	Female	0.4	0.1	0.1	.026	.006	–
	Male	1.7	0.4	0.6			
Felony arrests at ages 22 and over (<i>n</i> = 62)	Female	0.2	0.0	0.1	.019	.006	.031
	Male	1.2	0.4	0.1			
Property crimes (<i>n</i> = 62)	Female	0.5	0.0	0.2	.006	–	–
	Male	1.4	0.0	0.3			
Live with spouse (<i>n</i> = 49)	Female	0%	22%	27%	.023	–	–
	Male	0%	50%	0%			
Ever done volunteer work (<i>n</i> = 51)	Female	10%	33%	46%	.044	–	–
	Male	11%	60%	43%			
Voted in last Presidential election (<i>n</i> = 50)	Female	10%	67%	27%	–	–	–
	Male	33%	50%	14%			

Note -- The table presents means of continuous variables and percentages of categorical variables followed by *p*-values (less than .05) from two-way curriculum-by-gender analyses of variance. The first two variables are presented as continuous and as categorical.

^bJunior high school = 9, some high school = 10.5, high school graduate or GED = 12, vocational training or community college = 12.5, 1 year of college = 13, 2-year college degree = 14, 2 or more years of college = 15, 4-year college degree = 16, master's degree = 18, doctoral degree = 20.

Figure 1

Four Theoretical Approaches to Early Childhood Education

		Teacher	
		Responds	Initiates
Child	Initiates	Child-centered	Open framework
	Responds	Custodial care	Programmed learning

Note. From “Relationship of Curriculum, Teaching, and Learning in Preschool Education,” by D. P. Weikart, 1972. In J. C. Stanley (Ed.), Preschool programs for the disadvantaged. Baltimore, MD: Johns Hopkins University Press. Copyright 1972 by The Johns Hopkins University Press. Adapted with permission.