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ABSTRACT

This study investigated the sustained effects of Project Head Start for disadvantaged, black children in kindergarten and first grade. Participation in Head Start was compared to other forms of preschool experience and no preschool experience for disadvantaged children in two American cities in 1969-1970. Both preprogram background and cognitive differences were controlled in a covariance analysis design that used dependent measures in the cognitive, verbal, and social domains. Findings indicated that children who attended Head Start maintained educationally substantive gains in general cognitive and analytic ability, especially when compared to children without preschool experience. These effects were not as large as those found immediately after the Head Start intervention. Findings suggest an effect of preschool, rather than of Head Start per se. Initial findings of greater effectiveness of Head Start for children of below-average initial ability were reduced but not reversed. It is concluded that the diminuition of effects over time, especially for low-ability children, may reflect differences in quality of subsequent schooling or home environment. Nearly 60 references are cited. (RH)

Are Head Start Effects Sustained?

A Longitudinal Followup Comparison of Disadvantaged Children Attending Head Start, No Preschool, and Other Preschool Programs

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RUNNING HEAD: Are Head Start Effects Sustained?

Are Head Start Effects Sustained?
A Longitudinal Comparison of Disadvantaged Children Attending Head Start, No Preschool, and Other Preschool Programs

Abstract

This study investigates the sustained effects into kindergarten and Grade 1 of Project Head Start for disadvantaged Black children. Participation in generic Head Start programs was compared to both no preschool and other preschool experience for disadvantaged children in two American cities in 1969-1970. Incorporating both pretest/posttest and comparison group information, the study has advantages over other Head Start impact studies. Both pre-program background and cognitive differences were controlled in a covariance analysis design, using dependent measures in the cognitive, verbal, and social domains. Children who attended Head Start maintained educationally substantive gains in general cognitive/analytic ability, especially when compared to children without preschool experience. These effects were not as large as those found immediately following the Head Start intervention. Findings suggest an effect of preschool, rather than of Head Start per se. Initial findings of greater effectiveness of Head Start for children of below-average initial ability were reduced but not reversed. The diminution of effects over time, especially for low-ability children, may reflect differences in quality of subsequent schooling or home environment.

Are Head Start Effects Sustained?
A Longitudinal Comparison of Disadvantaged Children Attending Head Start, No Preschool, and Other Preschool Programs

Head Start, generally, is perceived as one of the few enduring successes of the Johnson Administration's "war on poverty" (Conger, 1988). The creators of the program had hopes that the early intervention would help disadvantaged children to break the "cycle of poverty by enabling them to start school on an equal footing with their more privileged peers" (Zigler & Valentine, 1979). But, despite the benefits that have been demonstrated to accrue to disadvantaged children in Head Start and other early intervention programs (McKey et al., 1985; Schweinhart & Weikart, 1980; Lazar & Darlington, 1982; Barnett, 1985), the distance between children who have been in Head Start and their more advantaged peers remains considerable (Lee, Brooks-Gunn, & Schnur, 1988; Hebbeler, 1985).

In addition, recent attention has been directed to the question of whether early interventions, Head Start and other programs, yield long-term effects (Barnett, Frede, Mobasher & Mohr, 1987; Evans, 1985; Hebbeler, 1985; Meyer, 1984; Schweinhart & Weikart, 1980, 1983; Seitz, Rosenbaum & Apfel, 1985). If effects "wash out" with time, as some have suggested (McKey et al., 1985), we need to address the question of when, to what degree, and why the effect diminishes. Moreover, when dealing with an experience as multifaceted as schooling, it is essential to examine effects in terms of multiple indicators, rather than a single measure such as IQ (Broffenbrenner, 1975; Rutter, 1983). Thus the question becomes, how do the various aspects of the Head Start experience affect young children, and how do those various effects change over time?

Head Start studies. Since its inception, Head Start had been the subject of a vast array of studies, varying in quality, design, and focus. Summarizing all extant literature and unpublished studies in a focused and coherent form, the Head Start Evaluation, Synthesis, and Utilization Project (McKey et al., 1985) reported immediate positive and educationallly meaningful effects of Head Start. These effects were followed, however, by variously declining performance in subsequent years, and few meaningful differences between Head Start and control groups on any measure by the second year after the end of Head Start attendance (i.e., by Grade 1).

Effects were evaluated in terms of educational (as well as statistical) significance, defined as an effect size (ES) or difference in standard deviation (SD) units of at least .25. Many of these studies may have underestimated the efficacy of Head Start, however, given the paucity of statistical controls for initial differences in cognitive and demographic characteristics of those who did and did not attend Head Start (Hebbeler, 1985; Lee, Brooks-Gunn & Schnur, 1988; Woodhead, 1988).

A handful of studies included in the Synthesis Project, which have looked at longer-term consequences on more "socially relevant" educational outcomes, have found Head Start "graduates" more likely to complete high school, less likely to repeat a grade or to be placed in special education classes. McKey et al. (1985) have concluded that, despite the loss over time of the Head Start advantage on specific cognitive measures, children who attended Head Start were at a more global advantage in school by virtue of having gained an important measure of social competence that enabled them to "...progress in school, stay in the mainstream, and satisfy teachers' requirements better than their peers who did not attend" (p. III-21). With effects near or above the educationally meaningful level at the end of the Head Start year, but fading thereafter, factors such as self-esteem, social behavior, and achievement motivation mirror patterns observed with cognitive measures.

Studies on the impact of demographic factors on cognitive outcomes report contradictory results. While children from classes with initially higher average IQ or SES demonstrated greater immediate effects of Head Start (an advantage which disappeared by Grade 3 -- McKey et al., 1985; Schweinhart & Weikert, 1980), studies focusing on individual rather than classroom measures of ability found larger Head Start benefits accruing to children initially more cognitively disadvantaged (Lee et al., 1988; Miller & Bizzell, 1983).

Other preschool programs for disadvantaged children. Besides the Synthesis Project, several notable studies have examined the longitudinal effects of preschool interventions on disadvantaged children on a range of socioemotional and cognitive measures. These studies include the Consortium for Longitudinal Studies (Lazar & Darlington, 1982), Head Start in Maryland (Hebbeler, 1985), and the Educational Testing Service (ETS) Head Start Longitudinal Study (HSLS -- Lee et al. 1988). The Consortium studies, however, do not examine ordinary Head Start preschools. Moreover, some

studies that did include Head Start had other goals and were not involved in evaluating Head Start per se. For example, the Louisville Experiment (part of the Consortium) was designed to evaluate program variation in the context of carefully designed Head Start classroom settings, rather than comparing Head Start to no preschool experience (the major comparison in the Synthesis Project studies). While Consortium findings have clear relevance for Head Start, they are not representative of the general Head Start experience. Their selection for the Consortium depended on their being especially high quality preschool "...research and demonstration programs...[whose] curricula were carefully designed and implemented" (Lazar & Darlington, p.65).

The Consortium examined preschool effects on 4 outcomes: school competence, ability, children's attitudes and values, and impact on the family. While significant effects were found in all four areas, the most striking was the reduced likelihood of program children being placed in special education classes during their school careers. The findings are interpreted as showing clear benefits of intervention both to individuals (in terms of allowing them to achieve school success, and presumably, the concomitant benefits) and society (in terms of the relative cost of special education).

Two studies included in the Consortium, the Louisville (Miller & Bissell, 1983; 1984; Miller & Dyer, 1975) and High/Scope-Perry Preschool (Schweinhart & Weikart, 1980; Schweinhart, Weikart & Larner, 1986) continued to collect extensive data on their subjects after participation in that collaboration. Both projects, concerned primarily with the effects of specific preschool curricula on disadvantaged children, followed a design including random assignment. Despite a strong design and longitudinal data collections, the Louisville results are tempered by high attrition rates at later followups. High/Scope researchers, while finding the most positive long-term results of any study of preschool for disadvantaged children, also encountered high attrition. Moreover, others have questioned these findings for placing evaluation and program development in the same hands (Bereiter, 1986). Even more than the Louisville study, the Perry Preschool Project was not a generic Head Start program, but an experimental, well-articulated, intensive, and multi-year program.

Project Follow Through was designed to examine whether a continuing program would produce more sustained effects. While results are equivocal since a large proportion of children in Follow Through never attended Head

Start and a large number of children used for comparison purposes did in fact attend Head Start, early studies indicated that 2 years after preschool, Head Start effects were sustained only for those also in Follow Through (Kennedy, 1978; Abelson, 1974).

One-year study of Head Start using the HSLS data. The present paper builds upon a recent study examining children's 1-year gains in Head Start (Lee et al., 1988), using data collected in the ETS Head Start Longitudinal Study (HSLS -- Educational Testing Service, 1971; Shipman, 1972). In that study, children in Head Start centers in two cities in school year 1969-70 were compared to two comparison groups: (a) disadvantaged children not in preschool that year (the traditional control group) and (b) children in non-Head Start preschools for disadvantaged children. Although all subjects lived in disadvantaged neighborhoods and were thus presumed eligible for Head Start, children in the two comparison groups (especially in other preschool programs) were initially advantaged on social background (mother's education, household crowding, single-parent family, and maternal reading habits) and in cognitive, socioemotional, and motor control status. Moreover, Head Start children were considerably more likely to be Black, with Black children lower on all social and cognitive measures at program entry.

The study evaluated all measures after the preschool year, presenting results with and without statistical adjustment for demographic differences. Unadjusted cognitive gains favored Head Start over both comparison groups for 3 of the 4 outcomes (ES = .21 to .40). Because of significant program-by-background interactions which would otherwise obviate use of an analysis of covariance (ANCOVA) design, adjusted gains were presented separately by race. Adjusted results showed significant Head Start effects for Blacks only. Head Start was significantly more effective for Blacks than either comparison group on a measure of impulsivity (ES=.27, .32), and significantly more effective than no preschool on a measure of sociocognitive development (ES= .32). Head Start effects significantly favored Black students who ranked below average in initial cognitive status. Thus, Head Start appeared to work best for students who needed it most (i.e., those initially the most socially and cognitively disadvantaged).

The study's strengths resulted mostly from the careful initial design of the HSLS. While the Synthesis Project summarized studies either by comparison group or pretest/posttest design, this study incorporated both comparison features. Unlike the majority of evaluation studies that examine

either single centers or specific educational models, the HSLS includes data from Head Start centers in multiple sites, and considerable efforts were made to canvas all children in designated disadvantaged neighborhoods in those cities in the study. The study's design included two comparison groups, a wide range of dependent measures, examination of results separately by race, as well as measures of initial status on cognitive and family/child characteristics, allowing statistical adjustment for potential bias due to the acknowledged non-equivalence of comparison groups.

The present study is a followup of the Lee et al. study, with our inquiry restricted to the Black HSLS sample. Using an array of measures of cognitive and social competence, we have examined the impact of Head Start relative to both comparison groups 1 and 2 years after the preschool experience (i.e., at the end of kindergarten and Grade 1). An issue of interest for the study is the change over time that accrues to children of differing cognitive ability levels, given the earlier findings.

Method

Original sample. This study is a longitudinal followup of a study described above using data from the HSLS (ETS, 1971; Lee et al., 1988; Shipman, 1972). Subjects in the earlier study included 969 disadvantaged children aged 4 to 5 in Trenton, NJ and Portland, OR, 696 (or 72%) of whom were Black. Selection procedures used a neighborhood canvassing procedure (poor neighborhoods) so that a large proportion of all age-appropriate and possibly eligible children in the two communities were included in the study. At the outset, children were tested and then enrolled in Head Start (46%), other preschool programs for disadvantaged children (22%), or were not in preschool (33%) in 1969-1970. Group assignment was subject to family choice and not under experimental control.

Present sample. Children from the original sample who remained in their communities and who attended half-day public school kindergartens in 1970-71 and Grade 1 in 1971-72 were eligible for the followup. All Black children in the original sample who had available data in 1969, 1970, 1971, and 1972 (hereafter referred to as Times 1 through 4, respectively) comprised the present sample. Although the original sample contained 173 White children, we restricted the present study to Black children, since non-random attrition 1 and 2 years past intervention (Times 3 and 4) was

significantly more likely for Whites and was larger for the No Preschool and Other Preschool than for the Head Start group, obviating the possibility of separate-by-race analyses due to unacceptably small White samples in comparison groups. The 1-year study, moreover, found significant positive effects for Head Start only for Black children, though it was impossible to determine whether the lack of effects for Whites resulted from race differences or low statistical power. We believe that lack of concern about ethnicity is a serious shortcoming of the preschool efficacy literature (Washington, 1985; Ogbu, 1985), and we regret that cross-race comparisons were not possible here.

[Table 1 about here]

Subjects are 646 Black children with some test data in the three follow-ups (1970, 1971, 1972) and family background and test data at the base year (1969). This represents 93% of the original sample of Black children (see Table 1). The small number of missing cases were statistically similar (in terms of family background and ability) to the analytic sample. Slightly over half (54%) of the children were from Trenton. Half (51%) of the children had spent the preschool year in Head Start, 32% did not attend preschool, and 17% attended other preschools. Both Head Start and non-Head Start programs were standard preschools (not day care) and were at least 8 to 9 months in duration. Other preschool programs existed under the sponsorship of universities, churches, and private organizations. Details on the preschool programs are available in Lindstrom and Shipman (1973).[1]

Outcome measures. Dependent measures tapped aspects of cognitive functioning other than verbal production, and included variables designed to examine other aspects of school readiness, such as social competence. The subset used here were selected from a larger set measured at Times 3 and 4 (Shipman, 1972), based on their diversity from one another and on reasonably low proportions of missing data. These measures tap three domains: verbal achievement (the Cooperative Primary Test), perceptual reasoning (Children's Embedded Figures Test, and the Raven's Colored Progressive Matrices), and social competence (California Preschool Competency Scale and the Schaeffer Classroom Behavior Inventory). The first 2 domains primarily are cognitive.[2]

The Cooperative Primary Test (1965-1967), a standardized achievement test for Grades 1.5 to 2.5, assessed verbal achievement at Time 4, with scores derived for listening skills, word analyses, and reading (50 to 60

items each). Z-score forms of sub-tests were summed (alpha reliability .80). Two tests measured the second cognitive domain, perceptual reasoning. Given at Times 3 and 4, the Children's Embedded Figures Test, a modification of the same test for 5- to 10-year-olds, measured differentiation and perceptual functioning (Dreyer, Nebelkopf & Dreyer, 1969; Witkin, Oltman, Raskin, & Karp, 1971). At Time 4 the Raven's Colored Progresive Matrices Test (Raven, 1965) presented a perceptual reasoning task not relying on verbal performance (Sets A, AB, and B). The task required selecting the piece that would complete a partially formed pattern from a set of six alternative graphics. Test/retest reliabilities range from .85 to .92; inter-item consistency is above .95. The test exhibits moderate correlations with intelligence tests relying more heavily on verbal performance.

Measures of social competence used teacher ratings. On the California Preschool Social Competency Scale (LeVine, Elzey & Lewis, 1969), kindergarten teachers used 30 items to rate "a child's successful integration into a preschool program" (Lytton, 1978, p. 510) at Time 3. Items tap work habits, communication, interpersonal relations, frustration, and help-seeking. Inter-rater reliability ranges from .75 to .86, with split-half reliabilities above .90 (LeVine, et al). While the test has clear face validity, no information on predictive validity exists, as there is no recognized standard of social competence with which it could be compared (Lytton). At Time 4, teachers completed a version of the Schaeffer Classroom Behavior Inventory (Schaeffer & Aaronson, 1967). Our analyses employed the task orientation scale.[3] The two inventories measure somewhat different competencies, as evidenced by their modest correlation (r=.299).

Family background, demographic, and site measures. Independent measures included a variety of familial and demographic measures obtained through interviews with mothers at the base year. The subset used includes: sex (1 = female, 0 = male), father's presence in the household (1=yes, 0=no), the proportion of children to adults in the household, and social class (SES).[4] The two sites were dummy coded (1=Trenton, 0=Portland). As children's age, family crowding, and the amount the mother reported reading to the child showed no significant differences between the program groups, these measures were not included as covariates. The general ability factor[5] controlled for cognitive functioning differences at the outset of the preschool year.

Subgroup background differences. Because group membership was not under experimental control, and because acceptance into Head Start was dependent in part on family circumstances, it is not surprising that children in the three program groups differed on demographic and family characteristics. Since, unfortunately, it is not unusual to find social background related to cognitive functioning, it is also not surprising that cognitive ability is related to group membership (Schnur & Brooks-Gunn, 1988).

A comparison of initial background differences (at Time 1) across program groups showed that Black children enrolled in Head Start were the least advantaged, in terms of demographic, family, and general ability characteristics. While there were no sex differences in program enrollment, students in Head Start came from families of significantly lower SES, were significantly less likely to have a father in the house, and had fewer adults per child in the household. The children who initially attended other preschools were relatively the most advantaged of this generally disadvantaged group of preschoolers, which is not surprising since modest fees are often associated with such preschools. On every demographic and ability measure (except gender), these children were significantly more advantaged than those in Head Start. Head Start children were similar to those who did not attend preschool in general ability level, with both groups differing from the Other Preschool group on this measure.

Differences in both SES and general ability at program entry were particularly marked, with Head Start children considerably below their Other Preschool counterparts (.67 and .43 SD, respectively). Given these significant differences among the program groups, statistical adjustment for such variation was required to properly evaluate the effects of Head Start participation on cognitive and social functioning in the early primary grades. Indeed, given our findings and those of other evaluations, adjustment for such initial differences should be considered mandatory in studies without random assignment.

Subgroup outcome differences. Since children initially enrolled in Head Start and No Preschool scored almost one-half SD below their Other Preschool counterparts in general ability at program entry, it would be reasonable to find a similar pattern of cognitive and social functioning 2 or 3 years later. Group mean scores are found in Table 2, with mean differences, as well as proportions and distribution of missing data on each measure tested for statistical significance. While the proportions of

missing data were not trivial (between 24 and 45%), only two of the dependent measures had non-random missing data, judged by either SES or ability. In every case, subjects missing data on the dependent measure were more advantaged than those with data. This means that statistical adjustment for background and general ability might underadjust, but never overadjust, for pre-existing differences.[6]

[Table 2 about here]

In most cases, unadjusted differences in dependent measures were minor. Only on the two measures of social competence were differences between Head Start and comparison groups significant (in opposite directions). As the 3 groups differed on many demographic and cognitive background measures, such initial differences have to be taken into account to appropriately evaluate program effects. While comparison of the unadjusted program means at Times 3 and 4 indicates the actual cognitive and social competence levels of disadvantaged Black children within the three experimental preschool conditions at the end of kindergarten or Grade 1, substantive conclusions about program efficacy should not be drawn from these comparisons.

Analytic procedures. The aim of an impact study of this type is to make inferences which attempt to attribute students' cognitive performance levels uniquely to their preschool experiences. Because students with different background may "grow" at different rates in the absence of treatment, initial background and cognitive group differences must be controlled in multivariate analyses. As before, we employed an (ANCOVA) research design with ordinary least squares regression.[7] The use of ANCOVA is restricted to situations where significant interactions between background factors and program participation are not present (Anderson et al., 1980; Cohen & Cohen, 1983). In no case were program-by-initial status interactions significant.

The three program variations were captured by two effects-coded variables, representing contrasts of Head Start with No Preschool or Other Preschool conditions. Covariates included initial cognitive status and the set of demographic variables described above. Dependent measures were the test scores presented in Table 2. Possible sex differences and program-by-gender interactions received careful attention. Although no sex effects were found in the original study, the possibility of emerging gender differences in primary school could not be discounted. Separate-by-gender analyses were run on those measures where significant sex differences were found.

Results

Results of the covariance analyses are presented (in Figure 1) as adjusted differences in outcome scores between Head Start and comparison groups in standard deviation (ES) units.[8] Positive coefficients favor Head Start; negative coefficients favor the comparison group. Analytic models generally explained between 10% and 25% of the variance in the dependent measures.[9] At the end of kindergarten, children who had Head Start preschool experience scored significantly higher on the California Preschool Competency Test than those who did not attend preschool (ES=.34). Other effects, while not statistically significant, are mostly positive (i.e., favorable to Head Start).

[Figure 1 about here]

While standard statistical testing is the most common method to determine the "significance" of effects, consideration of the "substantive significance" of effects has been suggested by well-respected researchers (Cohen, 1977; Rosenthal & Rosnow, 1984) and followed by the Synthesis Project. Rosenthal and Cohen have both concluded that effects should be considered "small" if less than .2 SD, "medium" if between .2 and .5 SD, and "large" if greater than .5 SD. Effects less than .1 SD are trivial. Looked at in this way, the substantive educational significance of effects is determined by their absolute magnitudes and direction (i.e., $\geq$.2 SD). Figure 1 thus shows several medium "educationnally significant" effects favoring Head Start. For example, Head Start is favored on the Cooperative Primary Test (ES=.28) compared to No Preschool and compared to both groups on the Embedded Figures Test (ES=.24 and .27 for the No Preschool and Other Preschool comparisons, respectively). While Head Start effects are lowest on the Schaeffer Inventory, they do not reach educational significance. All educationally significant effects (4 out of 10) favor Head Start.

Because of earlier findings of 1-year Head Start gains favoring low-ability Black children, we divided the sample into below- and above-average groups on general ability and used identical ANCOVA designs. While the same pattern was not characteristic of longer-term followup results, effects were generally larger when investigated separately for children of differing initial ability. Of the nine effects which met the criterion of educational significance, six were positive for Head Start. In terms of sex

differences, there were significant effects in social competence favoring girls ($p \leq .001$ for California Competency Test, $p \leq .01$ for the Schaeffer) -- noteworthy but not surprising. We thus examined Head Start effects separately for male and female children, finding one significant ($p \leq .01$) and substantial (ES=.49) Head Start effect (compared to No Preschool) favoring males on the California Preschool Competency measure, an effect also significantly different from that for females (ES=.23).

Discussion

Summary of findings. Participation in Head Start has enduring effects for disadvantaged Black children through Grade 1 on some measures of school success, particularly compared to no preschool attendance. Five tests measured skills in two domains: cognitive ability and social competence. Educationally substantive effects favoring Head Start appeared in the cognitive domain (specifically the Embedded Figures and Cooperative Primary Tests, but not the Raven's), and these effects were larger than those reported in the Synthesis Project for Grade 1. Thus, we have evidence of continuation of an effect demonstrated immediately after the Head Start experience (Lee et al., 1988). These effects were found when initial social and cognitive differences between those who did and did not have a Head Start experience were controlled.

Taking the findings of the two studies together, it is clear that strong effects favoring Head Start relative to both comparison groups at the end of the preschool year have been attenuated but not dissipated by the end of Grade 1, supporting the Synthesis Project results. The particularly strong Head Start effects for Black children of lower ability found at the end of the preschool year, however, have not been sustained through the early primary years. Moreover, whereas 1-year Head Start gains were favorable to both comparison groups, sustained effects are more prevalent in comparison to children without preschool experience than compared to those who attended other preschools for disadvantaged children. We interpret this as indicating that disadvantaged Black children benefit from any preschool experience, compared to none at all. In fact, Head Start serves the least advantaged of children in poor neighborhoods, and is likely to have been the major preschool option available to poor families in 1970. While this may be changing, given the increase in state- and city-sponsored

programs for disadvantaged preschool children and the expected increases in child care programs for mothers in AFDA-sponsored workfare initiatives, Head Start is still the focus of discussions on preschool for disadvantaged children.[10]

Possible explanations. Two logical (and not mutually exclusive) explanations might account for our findings of a diminution of effects over time. Both explanations are related to the fact that Black Head Start enrollees enter preschool and elementary school at a particular cognitive and social disadvantage. In 1970 as well as today, Head Start serves less than a third of all eligible children. Available evidence suggests that the most disadvantaged (i.e., the poorest of the poor) are being enrolled today as before (Hebbeler, 1985).

The first explanation is associated with the subsequent school experiences of these disadvantaged children. We know that social background is related to what school students attend, with residential location the determining factor. Particularly poor children are likely to be concentrated in low-SES schools, and this relationship is exacerbated for minority children in urban areas (Ogbu, 1986; Spencer, Brookins, & Allen, 1985; Wilson, 1987). Particularly poor (and minority) children are also likely to receive less favorable treatment in such schools, resulting in reduced learning opportunities (Alexander & Entwisle, 1989; Rist, 1970; Sorensen, 1987). Such social disadvantages are compounded by differential treatment in school based on lower cognitive status (Barr & Dreeben, 1983; Rist, 1970). Thus, these children's elementary school experiences, relative to their more socially and cognitively advantaged counterparts, could very likely "undo" the advantages accrued as a result of a year in Head Start. It is unrealistic to expect a 9-month intervention, either Head Start or any preschool program, to overcome the past or future accumulated effects of disadvantage. As Zigler has stated repeatedly, "We simply cannot innoculate children in 1 year against the ravages of a life of deprivation" (1987, p. 258).

Another explanation relates to family environment. Children with less educated parents, with fathers less likely to be present, whose family incomes are especially low, are likely to experience some academic deprivation associated with such environmental conditions (Lee, 1985; White, 1982). The less advantaged home backgrounds of Head Start children relative to the comparison groups considered here, could also contribute to

"undoing" the immediate advantages from the Head Start experience, and such conditions are likely to be confounded with the unfavorable school and classroom experiences discussed above.

Policy implications. There are three policy implications we draw from this study, the first two of which relate to the results themselves, while the third concerns what is not in this paper. First, the fact that Head Start (and other preschool programs) have some effects which are sustained through the early primary years argues in favor of continuing (and possibly increasing) federal support for preschool programs for disadvantaged youngsters. The second implication -- one we would like to highlight -- relates to the amelioration of the particularly strong effects found after a year of the program for the most cognitively disadvantaged students. If 1 year of an intense educational experience targeted for such children can show strong effects, the more abbreviated compensatory programs perhaps available to such children are unlikely to overcome what are likely to be especially poor school experiences. Chapter I, for example, is a pull-out program for cognitively disadvantaged children in low-SES schools of only 2 to 3 hours/week. Such findings suggest that a more intense program "works" while a less intense one probably does not. This argues for widespread expansion of stimulating educational experiences targeted at cognitively and socially disadvantaged young children in the elementary years.

The third policy implication is drawn from the nature of the HSLS itself. Renewed interest in preschool education for disadvantaged children forces us to look at data collected nearly two decades ago. We have chosen to analyze the HSLS data because of its strong design: large samples, generic Head Start programs, two comparison groups, two diverse sites, carefully collected baseline and longitudinal measures. However, we are forced to impute the effectiveness of current Head Start programs from a rather dated study. Why? There are literally no studies of such quality currently available. The HSLS was a federally funded effort begun during the War on Poverty. Such studies are intense and expensive. Without federal support for careful program evaluation, as well as support for the programs themselves, the concerned and interested public is in no position to judge whether such programs are worth supporting. We believe that the results presented here argue for an intensification of support for compensatory preschool and early elementary programs. We argue that such

program support must be accompanied by federally financed and carefully designed evaluation efforts.

While it is gratifying to find sustained effects of Head Start participation for Black children, it is also unfortunate that we are unable to provide evidence of the program's efficacy for non-Black children (including Whites). We do not believe that the effects are restricted to Blacks, not that Head Start is a "Black" program. Indeed, only 40% of Head Start enrollees in 1985-86 were Black (ACYF, 1987). This and other evaluations of Head Start (e.g., Lazar & Darlington, 1982; McKey et al., 1985) at present provide better and more complete data on Blacks, but such results say nothing about Head Start's applicability to other ethnic groups.

Clearly, if we wish to "close the gap" between advantaged and disadvantaged children, educational services need to go beyond the provision of short-term interventions. Policy decisions which support the expansion of preschool programs, without addressing the more fundamental question of trying to alter what happens to disadvantaged children in our nation's public schools, are shortsighted. Research such as this, which provides evidence of some success of preschool education for disadvantaged children, could be used to support arguments for what might be politically expedient and even short-sighted "solutions" to a pervasive problem (Woodhead, 1988). Inducing sustained and successful academic experiences for children of poverty throughout their educational careers, rather than focussing on efforts to "fix" the problem with 1-year preschool programs (however successful they may be) is absolutely essential.

Technical Notes

1. Some comparisons with current Head Start programs are in order. Our sample contained more Blacks (and no Hispanics) compared to current figures (i.e., in 1970 the Trenton sample was 94% black; in 1986 66% Black and 17% Hispanic; in 1970 the Portland sample was 82% Black, but 31% Black and 16% Asian in 1986 -- Administration for Children, Youth, and Families, 1987). In addition, even though more mothers of young children are in the work force today than in the early 1970s, the availability of day-care services is still an issue, especially in disadvantaged communities (Schweinhart, 1985). Head Start is still one of the few child care options available for 4-year-olds.
2. The Matching Familiar Figures test was given at Times 3 and 4 (Kagan, Rusman, Day Albert & Phillips, 1964). Positive but non-significant effects were found for Head Start compared to the two comparison groups.
3. The revised Schaeffer Classroom Behavior Inventory (Schaeffer & Edgerton, 1978) includes features of the earlier test as well as others (specifically, task orientation). The newer scale has adequate internal consistency, factor structure, and predictive validity to measures developed in the late 1960s (Anderson & Messick, 1974; Zigler & Trickett, 1978).
4. The SES factor was constructed as the sum of standardized versions of (a) mother's education; (b) occupation of household head, on Hollingshead scale; and (c) family income at Time 2. Alpha reliability: .58.
5. Factor weights of tests given at Time 1 (Lee et al., 1988) for a general ability control were: Peabody Picture Vocabulary Test:.64; Caldwell Preschool Inventory: .73; Motor Inhibition Test: .33; Eight-Block Sorting Task: .52, Factor explained 56% of the combined variance, with alpha reliability of .72.
6. This pattern of missing data is unusual. Commonly in educational research, students with missing data are less socially and academically advantaged. The unusual pattern is likely to reflect the HSLS focus on Head Start and on texting in schools in poor neighborhoods.
7. While we believe ANCOVA is the best technique to create statistically equivalent comparison groups, such "equivalence" is of course limited by the appropriateness and reliability of control variables included.

8. Effect sizes are computed by first doubling the unstandardized regression coefficient for the particular contrast, then summing it with the coefficient of the other contrast. This sum is divided by the SD of the dependent measure for the entire sample (Draper & Smith, 1981).
9. In general, the proportion of variance explained is highest for measures of social competence (.23 for California Preschool Competency, .16 for Schaeffer) and lower for the cognitive tests (.10 for Raven's, .16 for Cooperative Primary Test, .07 for Embedded Figures Test).
10. It has been suggested that contemporary intervention programs for disadvantaged preschoolers are better designed and potentially more efficacious than those of almost two decades ago. Under this view, these results may be seen as representing a lower bound for effectiveness of the Head Start program.

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Table 1

Head Start Study: Sample Sizes for Head Start, No Preschool, and Other Preschool Groups for 2 Sites

Site	Head Start	No Preschool	Other Preschool	Total
Trenton, New Jersey	142 (48.1%)	106 (35.9%)	47 (15.9%)	295
Portland, Oregon	191 (54.4%)	98 (27.9%)	62 (17.7%)	351
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Subtotal	333 (51.5%)	204 (31.6%)	109 (16.9%)	646

Table 2

Head Start Study: Means and Standard Deviations of Dependent Measures for Three Program Groups

Measure	Head Start	No Preschool	Other Preschool	Missing Data (proportion)
Perceptual reasoning				
Embedded Figures Test (Time 4)				30.3(a)
Mean	7.32	6.59	6.90	
SD	(3.75)	(3.77)	(3.16)	
Raven's Progessive Matrices (Time 4)				23.7(a)
Mean	15.27	15.45	16.09	
SD	(3.47)	(3.27)	(3.96)	
Verbal achievement(b)				
Cooperative Primary Test (Time 4)				45.4(a)
Mean	-.02	-.15	-.01	
SD	(.95)	(.74)	(.92)	
Social competence(b)				
Calif. Preschool Competency Test (Time 3)				37.3(c,d)
Mean(e)	79.20	72.46	83.60	
SD	(19.68)	(21.19)	(21.77)	
Schaefer Classroom Behavior Inventory (Time 4)				42.1(d)
Mean(e)	16.64	18.23	18.33	
SD	(5.81)	(5.35)	(5.63)	

[a]Mean difference on demographic and ability measures between retained and missing subjects not statistically significant, measured with t-tests.

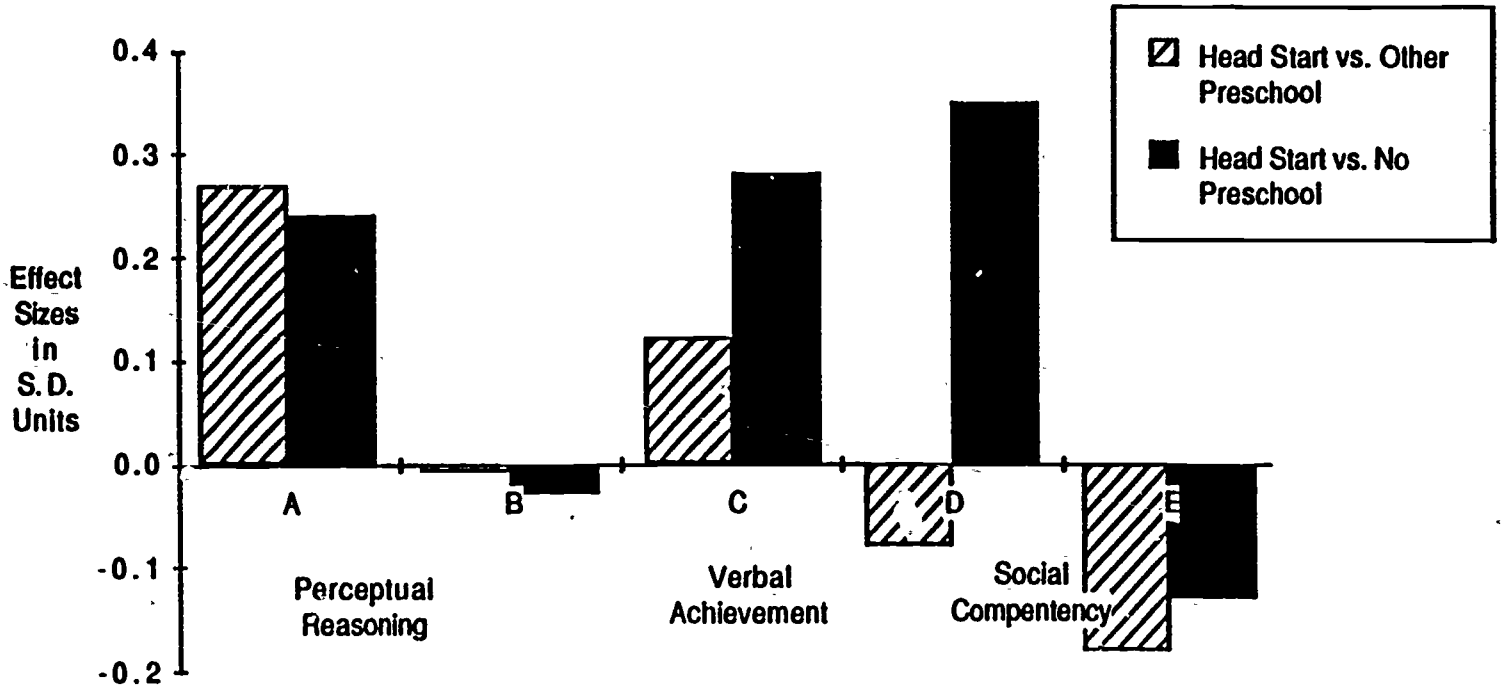
[b]Missing data for these measures is due, in large part, to the fact that data were collected only in classrooms with high proportions of sample subjects.

[c]Mean difference on social class between retained and missing subjects favors missing cases, $p<.05$.

[d]Mean differences on general ability between retained and missing subjects favors missing cases, $p<.05$.

[e]Mean difference between Head Start and No Preschool groups significant, $p<.05$.

Figure 1
Adjusted Effects of Head Start Participation on Performance in Kindergarten and Grade 1



A Embedded Figures
B Raven's Matrices
C Cooperative Primary
D Calif. Preschool Competency
E Schaefer Inventory