

**PARTICIPATION IN PROJECT HEAD START:  
DETERMINANTS AND POSSIBLE INTERMEDIATE-TERM CONSEQUENCES**

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## **PARTICIPATION IN PROJECT HEAD START: DETERMINANTS AND POSSIBLE INTERMEDIATE-TERM CONSEQUENCES**

The 1988 wave of the National Longitudinal Survey of Youth (NLSY) included a series of questions addressed to the mothers of children age three and over about whether or not their children had ever been enrolled in a Head Start program, the age at which their children were enrolled in the program, the length of their children's enrollment in the program, and their satisfaction with the program. The 1988 and 1986 waves of the NLSY also included assessments focusing on the children's cognitive and socioemotional development. This report presents: (1) summary statistics based on responses to these Head Start questions; (2) multivariate analysis examining the independent predictors of Head Start enrollment; and (3) multivariate analyses examining the extent to which enrollment in a Head Start program may have impacted on a child's behavior and verbal and reading skills over a two year (1986-1988) period, controlling for a full range of background factors including behavior problems and verbal ability at the initiation of participation in the program. Comparisons are made with children who had participated in other (non-Head Start) preschool programs, as well as with children who did not participate in any preschool program.

### **The Data Set and Sample for Analysis**

The NLSY initially included a nationally representative sample of 12,646 men and women who were 14 to 21 years of age on January 1, 1979. This sample included approximately 11,400 civilian and 1,200 military respondents. The civilian respondents have been interviewed annually through 1990, whereas the military sample was terminated following the 1984 interview round. The sample is approximately equally divided between male and female respondents. As of the 1988 survey round, the sample included 5,299 of the original 5,828 civilian female respondents interviewed in 1979; 3,336 of these women had become mothers by the 1988 survey round and had 6,540 children. These women may be considered as representative of all American women

23 to 30 years of age as of January 1, 1988 and their children may be considered as typifying children born to the national sample of women defined above. The NLSY sample includes an over-representation of black, Hispanic and economically disadvantaged white respondents so as to permit statistically reliable racial/ethnic and socioeconomic comparisons. Appropriate weights are available (and are used in this research) for translating this sample into a fully nationally representative sample of women age 23 to 30 and of children born to this sample of women.

The NLSY data set, both because of its large nationally representative sample and the depth and breadth of its content, provides a unique opportunity for considering a variety of program and policy-relevant issues. The 1988 survey round included several Head Start-related questions addressed to the mothers in the sample. Specifically, mothers were asked the following with respect to all children age 3 or over: 1) Has ( ) ever been enrolled in a preschool program (not including kindergarten)?; 2) Has ( ) ever been enrolled in the Head Start Program?; 3) How old was ( ) when he/she first attended Head Start?; 4) In total, how long has ( ) attended (did ( ) attend) Head Start?; 5) How satisfied (are/were) you with what Head Start has done for ( )?; 6) How satisfied (are/were) you with what the Head Start program has done for you?; and 7) Were you ever in Head Start as a child? This information was collected for almost 5,000 children.

The NLSY data set also includes a full range of information about the attributes and behaviors of the mother and other family members in the children's household. This includes detailed information regarding income, employment, education and family which can be directly linked with the likelihood of a mother having a child participate in Head Start. It is therefore possible to examine probabilities of Head Start participation by, for example, the mother's level of education, family well being, geographic area of residence, mother's

intellectual well being (as measured by her scores on the Armed Services Vocational Aptitude battery), and the mother's participation in Head Start, to mention just a few factors.

Children participating in the 1986 and 1988 survey rounds completed an extensive battery of assessments aimed at measuring their cognitive and socioemotional development. These assessments make the NLSY a unique vehicle for assessing Head Start effectiveness for a national sample of children for two important reasons. First, it is possible to compare assessment scores for children participating in Head Start, children participating in other preschool programs and children not participating in any program. This makes it possible to evaluate the extent to which Head Start programs are recruiting children most in need of assistance. Second, and more importantly, because we have measures for selected assessments from two points in time (1986 and 1988) we are in a position to examine, within a multivariate framework, the extent to which a child's score on selected assessments changed between 1986 and 1988 as a function of whether or not he/she was enrolled in a Head Start program in the intervening period. That is, controlling for a full range of maternal and family attributes which could be linked with both Head Start participation and child well being, and controlling for cognitive and emotional well being at the approximate time of entry into Head Start, we are in a position to compare the two year (1986-1988) development of Head Start children (hereafter referred to as "Head Start participants") with that of children who participate in other preschool programs as well as with that of children who do not participate in any preschool programs. The ability to control for pre-participation differences among the groups of children in our sample enables us to avoid the methodological problems which characterize many earlier attempts at evaluating the effectiveness of Head Start (Lee, Schnur and Brooks-Gunn, 1988). Evidence of the need for such statistical controls is provided by Moore (1982), who states that Head Start serves less than one-third of all eligible 4 year olds, and by studies which describe a selection bias toward the

children from more disadvantaged families (Seitz, Abelson, Levine and Zigler, 1985; Zigler, Abelson, Trickett and Seitz, 1982).

### **Who Enrolls in Head Start?**

#### **NLSY Children: Three Years Old and Older**

In this research we focus on two distinct groups: all NLSY children who had attained three years of age as of the 1986 survey (and thus, by 1988 were almost past the age for participation in Head Start); and secondly, a smaller group of children who were eligible to participate in Head Start between 1986 and 1988. This latter group is the focus of our evaluation of recent Head Start participants.

It is important to note that the children age three and over in this sample were all born to women who were below the age of 25. As indicated in Table 1, most of the mothers were between the ages of 16 and 24. (This reflects a basic sample constraint of the NLSY.) The children in this sample do not, therefore, typify all American children. Rather, they disproportionately represent the children of younger mothers. These are children who are more likely to have been enrolled in a Head Start program than are children born to older mothers.

Overall, 16.8 percent of all the children in our sample either are or have been enrolled in Head Start at some time. Enrollment figures range from 9.5 percent for all of the white children, to 22 percent for the Hispanic children and about 36 percent for the black children. The data presented in Table 1 suggest that children most in need of Head Start assistance, (children who came from the poorest families and whose mothers have less education, scored poorly on an aptitude assessment (the Armed Forces Qualification Test), and who began childbearing at the earliest ages), are much more likely to have been enrolled in Head Start programs.

Prior maternal enrollment in a Head Start program is an important predictor of Head Start participation. About 43 percent of mothers who had been enrolled in Head Start have their

children enrolled in Head Start, compared with only 14 percent for mothers who had not been in the program. In addition, the child's score on the 1986 Peabody Picture Vocabulary test, (a more direct measure of children's need for assistance), suggests that children who scored poorly on this assessment, and thus were in greater need of help, were much more likely to have been in a Head Start program. It should be noted that these statistics are for all NLSY children age 3 and over in 1986; therefore, they include older children who are well past Head Start age. Subsequent tabular and multivariate analyses in this report will focus more directly on younger children, between the ages of four and six in 1986, who more directly profile children currently eligible for the program.

While the overall relationship between the various socioeconomic variables and Head Start participation was quite pronounced for the entire sample of children, it should be noted that this inverse pattern of association is most pronounced for white children and somewhat less pronounced for minority children. In general, our data indicate that the most advantaged (in terms of family characteristics) members of all racial/ethnic groups in our sample tend to have lower Head Start participation rates. This issue will be discussed later in this report, when we focus on children currently eligible for Head Start.

Tables 2 and 3 provide information about the duration of enrollment in and degree of maternal satisfaction with Head Start for all children who have completed the program. Overall, about 34 percent were enrolled for less than a year, 39 percent for one year and about 27 percent for two years or more (Table 2). White children are somewhat more likely to have been enrolled for less than a year, and black children more likely to have participated for two years or more, but the differences are modest. The differences by maternal education are not systematic, but there is some evidence that children who scored best on the Peabody Picture Vocabulary test had, on average, a shorter period of enrollment in the program.

It may be seen from Table 3 that large proportions of mothers are very satisfied with what the program has done both for their children and themselves. Overall, 80 percent of the mothers are very satisfied with what the program has done for their children, and this statistic varies little by race/ethnicity or other characteristics. Conversely, only very small percentages of mothers are dis-satisfied with the program. To the extent that variability in satisfaction does exist, there is some suggestion that the Hispanic mothers are most satisfied and black mothers least satisfied with what the program has done for their children. It should be emphasized, however, that overall levels of satisfaction are very high for all groups.

### **NLSY Children: Four to Six Years Old**

The remainder of this report focuses on children who were eligible to participate in Head Start programs between the 1986 and 1988 surveys. Our research focuses on two questions: who participates in Head Start (and who doesn't), and the possible effects of having participated in Head Start. When we address the issue of which children participate in Head Start we focus on all NLSY children who were between the ages of four and six in 1986. However, when we examine the possible effects of having been enrolled (or not enrolled) in the program, our sample is somewhat more constrained. This is a reflection of limitations inherent in our data set. First, our knowledge regarding a child's participation in Head Start rests on two pieces of information: whether the child was reported as having been enrolled in Head Start; and, if reported as having been enrolled, the age at which the child was enrolled. In the multivariate analysis which follows, we define a child as having been enrolled between the 1986 and 1988 survey points if he or she was between ages three and five in 1986, and if the child's age at entering the program was greater than or equal to his or her age at the 1986 survey point. Additional constraints in specific equations reflect a child's eligibility for taking a given assessment in 1986. For example, when examining changes in Behavior Problem assessment

scores between 1986 and 1988 in relationship with Head Start enrollment during that interval, the sample is limited to children age four or older in 1986, since that was the minimum age for receiving the behavior problems assessments. The multivariate analysis is therefore focused on comparisons of age-eligible children who were enrolled and not enrolled in Head Start between the 1986 and 1988 surveys and who otherwise had the requisite information on all the other essential explanatory variables.

Table 4 provides enrollment statistics for all NLSY children who were four through six years old in 1986. The participation rates in this table closely parallel the rates cited earlier in Table 1. The results by race/ethnicity and socioeconomic status also essentially mirror the results already presented in Table 1, with systematic differentials by socioeconomic status and race as well as generally better defined socioeconomic differentials appearing for the white and Hispanic children.

The NLSY also provides information on enrollment in other preschool programs. This information is synthesized in Table 5. Overall, about 15.5 percent of four through six year old NLSY children have participated in Head Start, 43 percent in other preschool programs and 41 percent have not participated in any preschool program (Head Start or otherwise). Children of mothers who have less education and who scored poorly on the Armed Forces Qualification Test were more likely than others to have participated in Head Start, but also more likely to not have been involved in any preschool program. Thus, while Head Start helps these children overcome an educational disadvantage, it does not compensate to an extent sufficient to overcome the reality that these children are less likely than all others to participate in any preschool program (Head Start or otherwise).

Interestingly, Head Start appears to compensate for lower enrollment rates in other programs for children from the poorest families, where family income is under \$10,000. Children in these families are most likely to be enrolled in Head Start, even though their involvement in



other preschool programs is as extensive as that of other children in all families with annual incomes under \$25,000. In fact, when one combines Head Start and other preschool program enrollments, children from the poorest families are as likely to be involved in a preschool program as children from the highest income group (i.e., \$25,000 and over). Children least likely to be participating in a preschool program are those in the middle income categories (i.e., \$10-\$15,000 and \$15-\$25,000).

Table 6 provides mean characteristics for all 4 to 6 year old children included in this analysis. Tables 7 and 8 consider within a multivariate (logit) framework the independent linkages between a full range of family and maternal attributes and behaviors and Head Start or (in Table 7) other preschool program involvement. Logit analysis is used because it is statistically preferable to ordinary least squares analysis when using a dichotomous dependent variable. It may be seen, after controlling for a full range of background factors, that black children, children of mothers who score poorly on Armed Forces Qualification Test, children from poorer households (in comparison with children from households where incomes are \$25,000 or above) and children whose mother had been in a Head Start program are significantly above average in their likelihood of participating in Head Start. This result supports the findings of others that the children most in need of Head Start assistance are indeed most likely to receive that assistance (Hebbeler, 1985; Royster et al., 1979; Schnur and Brooks-Gunn, 1989; and Washington and Oyemade, 1987). Results reported in Table 7 also indicate that Head Start participants are different from other children in terms of geographic characteristics (i.e., urban versus rural residence and region of residence).

In a number of important respects, children enrolled in preschool programs other than Head Start come from families with characteristics which are almost mirror images of the Head Start families (see the middle equation in Table 7, which compares other preschool children with all other children). "Other preschool" children are more likely to be white, have mothers who

scored well on the AFQT, be from higher income families and have mothers who were not in Head Start. This "mirror image participation profile" is consistent with the notion that Head Start fulfills an important compensatory role for children from disadvantaged families (Kirk, von Isser and Elkins, 1977; Zigler and Muenchow, 1984; Zigler and Valentine, 1979).

Finally, children who are not enrolled in any preschool program, Head Start or otherwise, tend to be rural, have less educated mothers, live in the North Central region of the country, and come from large families. This abbreviated profile suggests average characteristics for a population of children most at risk, in terms of not currently receiving the benefits of preschool programming of any kind. This pattern seems to profile larger poor rural families, particularly from the middle U.S.

The equations in Table 8 stratify the overall population of eligible children, examining separately the determinants for Head Start participation black, white and Hispanic children, as well as for children from poorer (under \$15,000) households. It is fair to suggest that the patterns evidenced from these separate equations are generally similar to those noted for the overall equation in Table 7. The explanatory power of the equations is clearly reduced, largely reflecting the fact that several of the variables which were most significant in Table 7 are the factors by which we are stratifying in Table 8. Also, the much smaller sample sizes for the equations in Table 8 make it more difficult for particular coefficients to attain statistical significance, even where the coefficients may be essentially similar in size to those in Table 7.

While fewer coefficients in the "Less Than \$15,000" equations in Table 8 attain significance, the patterns are generally similar; children in the poorest families (under \$10,000) are more likely to be Head Start participants, as are children who have mothers who had been enrolled in Head Start. The race (black) and mother's AFQT coefficients no longer attain significance, partly reflecting the smaller sample size and larger standard errors for these equations.

An examination of the separate race/ethnicity equations suggests that the results for white children closely parallel those for the equation for all children. In general, the disadvantaged, whether defined in terms of income or maternal aptitude, are most likely to have children who participate in Head Start. For black children, fewer coefficients attain significance, although several of the family income categories (in comparison with the omitted \$25,000 and over category) are significant, paralleling the income result for black children presented in Table 4. In general, the smaller social class differentials for black children noted in that table are still found in the regression analysis. By comparison, when controlling for the full range of predictors, the result for the Hispanic subgroup suggests that Hispanic participation in Head Start is much more random, that the program selects more equally across a full spectrum of youth. This is supported by the fact that none of the variables in the Hispanic equation attain (or even approach) significance. In summary, the tabular and multivariate results support the conclusion that for white and black children there is evidence that Head Start selects the children most in need of pre-school assistance. The evidence is less clear in this regard for Hispanic youth. This may be linked with several factors. First, our Hispanic sample is quite heterogeneous in terms of its origins, including Mexican-American, Puerto Rican and Cuban children as well as smaller numbers from other Hispanic populations. It could be that this heterogeneity is masking effects which might be in evidence if we could examine the separate Hispanic subgroups (something which we can not do because of sample size constraints). Second, it might be that a common denominator which might be an important predictor for this group is English language efficacy, a factor we cannot readily consider. If language is the critical dimension, and if the factors we are measuring are not useful proxies for this factor, the specification of our Hispanic equation might be inadequate.

### **Head Start Goals and NLSY Child Assessments**

As originally conceived, Project Head Start was intended to meet seven goals, among which were the improvement of children's mental processes and skills (with particular attention to conceptual and verbal skills), and the fostering of children's emotional and social development. The NLSY includes a variety of child assessments that are used to measure cognitive, social and emotional development. In this analysis we utilize assessments that measure the frequency, range and type of childhood behavior problems. We also utilize two child assessments which measure development in reading recognition and comprehension.

No single assessment in the NLSY addresses the entire range of domains comprising the concept of socioemotional development. However, two NLSY assessments, the Behavior Problems Index, and three subscales of the well-validated Temperament Scale, enable us to address specific domains. (These assessments are described in Appendices 1A through 1C.) These particular assessments provide an important advantage compared to many of the measures used in previous studies. Walker (1973) criticizes the previously-used measures on the basis of low validity (which is, in part, a function of their dependence on the child's verbal ability and desire to provide "correct" responses) and low reliability. The Behavior Problems Scale and Temperament subscales are observational in nature. The Behavior Problems Scale was completed by the mothers of all children age four and over in 1986 and 1988. Scores are thus available for two points in time for almost 1,200 children who were age-eligible for Head Start participation between the 1986 and 1988 survey rounds. Our examination of changes in scores on the assessments is therefore psychometrically completely appropriate. The sample of children whose mothers completed the Temperament subscales is more constrained, since it was limited to children under the age of seven in 1986 and 1988. Scores for this assessment for

both points in time were essentially limited to children who were four years of age in 1986 and thus had not yet attained the age of seven by 1988 (approximately 250 children).

We are more limited in our examination of changes in cognitive (reading) achievement scores between 1986 and 1988. This is because all the age appropriate children in this study received the Peabody Picture Vocabulary assessment in 1986 but not in 1988. In 1988, all the children in this study completed the Peabody Individual Achievement Test (PIAT) reading recognition and reading comprehension assessments. (Most of this sample had been too young to complete this assessment in 1986.) Because of these data constraints, we examine changes in scores between 1986 and 1988 on two somewhat different reading assessments. While it would have been preferable to have compared scores on the identical assessment, this was not possible. However, in both cases, 1986 and 1988, we have percentile scores for each child which have been normed against national samples of children<sup>1</sup>. Virtually all appropriate age-eligible children completed these assessments at 1986 and 1988 respectively<sup>2</sup>.

Using the Behavior Problems Index and PPVT and PIAT assessments enables us to avoid Walker's third criticism of socioemotional measures - a lack of standardization procedures. The outcome measures for the Behavior Problems score and subscores, as well as for the PPVT and PIAT assessments, are percentile scores normed against national populations. Since normed estimates are not available for the three Temperament subscales considered in this study, (i.e., the "compliance", "insecure attachment" and "sociability" subscales), the outcome measures used are raw scores, which range from 3 to 15 for sociability, 6 to 30 for compliance and 7 to 35 for the insecure attachment subscale. Given the very constrained age range of children

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1. For a younger sub sample of children which completed both assessments, we found a correlation of about .5 between reading recognition and reading comprehension scores for children completing each assessment in both years, and a correlation of about .4 between PPVT scores in 1986 and PIAT reading scores in 1988. Thus, the correlations across assessment across years is quite substantial.

2. Non completion rates on these assessments ranged between ten and 15 percent, depending on the child's age and race/ethnicity.

considered for this particular assessment (all four years of age in 1986 and 6 years of age in 1988) this should not pose any particular problem.

In this study, higher scores on the PIAT and PPVT are preferable outcomes. On the other hand, higher scores on the Behavior Problem Index or its subscales are evidence of greater behavior problems in comparison with other children in the study. Positive changes in scores for the cognitive assessments, (or a positive coefficient in a regression equation), may be viewed as an "Improvement" and a negative sign as deterioration. The opposite is true with regard to changes in behavior problems. Interpretation of increasing scores on the Temperament subscales is related to the direction implied by the particular subscale (i.e., increasing insecure attachment may be negative, increasing sociability positive and increasing compliance ambiguous).

### **The Study Groups: Pretest Descriptions**

Our assessment of the possible impacts of participating in Head Start is based on comparisons of NLSY assessment scores for three distinct groups of children. The first group, Head Start participants, (as stated earlier) comprises those children who were identified by their mothers as having been enrolled in Head Start, and whose Head Start enrollment ages were equal to or greater than their age at the 1986 survey point. Clearly, some children we are considering as enrolled could have been enrolled for some months as of the 1986 survey (e.g. four years of age at survey and four years of age at enrollment). The data are not sufficiently precise to permit further refinement of the definitions. One implication of this is that to the extent some children will already have participated in Head Start by the 1986 survey point, we may be understating some of the effects of program participation.

The two comparison groups used in this study are composed of comparably aged children (as of 1986) who did not participate in any preschool program between 1986 and 1988, and children in the same age range who participated in preschool programs other than Head Start.

Table 9 provides 1986 mean assessment scores for Head Start participants, children in other preschool programs and children who did not participate in any preschool program. The data presented in this table suggest the extent to which Head Start participants may be cognitively and emotionally disadvantaged, compared with other children their age, prior to their entry into Head Start. It may be seen, for example, that their mean score on the PPVT was well below that for other children their age. The average Head Start child in our sample scored at about the 27th percentile in 1986, compared with the 40th percentile for children who were not involved in any preschool program, and the 43 percentile for children who enrolled in other non-Head Start preschool programs<sup>3</sup>. These observed differences in cognitive background among the three groups parallel the findings of other investigators. (See, for example, Lee, Brooks-Gunn and Schnur: 1988). Note that the mean for all of these children is below the 50th percentile, which would be the mean for a fully national representative cross-section. This is because the children in this sample are disproportionately the children of younger mothers. They would therefore be above average in the likelihood of coming from poorer households and having mothers with only limited education. These factors are controlled for in the multivariate analyses.

Overall differences in Behavior Problems percentile scores for the children as of 1986 are more modest, with Head Start participants having slightly higher scores, implying (on average) a slightly greater level of behavior problems. It is of some importance, however, to note that the relative position of Head Start participants in the various Behavior Problem subscales shows some variability; as of 1986, Head Start participants score considerably higher (and thus, on average,

3. To the extent that children who enrolled in other preschool programs may have begun at a younger age, they would have had a comparative advantage over Head Start children who began their program at a later point.

have a greater tendency to have that particular behavior problem) on the antisocial and anxious-depressed subscale, are modestly higher than the other children in terms of being hyperactive, dependent and having peer conflicts and, indeed, score the lowest on being headstrong (the components of all these subscales may be found in the appendix). In general, children who participated in other preschool programs or who were not involved in any program were similar to each other on the various behavior problem subscales, and thus both about equally distanced from the Head Start participants. Finally, with regard to the three mother reports on the Temperament subscales "compliance", "insecure attachment" and "sociability" (all defined in the appendix) it would appear that our Head Start sample did not differ in any important ways from the other subsets of children.

We have strong systematic evidence that, both cognitively and emotionally, Head Start participants differ from other children their age. It therefore is essential to control for these baseline child traits when examining potential effects of Head Start in children. Otherwise, any results would be systematically biased towards overstating potentially detrimental (or understating positive) intellectual and behavioral program effects (Anderson et al., 1980; Cook and Campbell, 1979).

### **Possible Effects of Program Involvement**

We examine, in this section of the paper, whether there is any evidence of changes in selected cognitive or behavioral test scores between 1986 and 1988 which could be linked with participation in a Head Start program. The modus operandi is to examine, within an ordinary least square (OLS) regression framework, the association between changes in scores on a number of child assessments between 1986 and 1988 and Head Start participation during that interval controlling for the child's score on appropriate assessments at the base point (1986), and a full range of explanatory variables which could be independently linked with the probability of



Head Start participation as well as the child assessment(s). The independent variables included in this analysis are the same ones included in the earlier equations predicting Head Start enrollment.

Table 10 synthesizes the independent associations found between intervening program participation (in Head Start or other preschool programs) and the changes in the various outcomes between 1986 and 1988, controlling for base year test scores as well as a full range of explanatory variables (as listed in Table 8). Changes in Behavior Problems scores and subscores are based on comparisons of 1986 and 1988 scores on identical assessments. The same is true for changes in Temperament scores. Cognitive score changes are, as noted earlier, based on differences between 1988 PIAT reading percentile scores and 1986 PPVT percentile scores. Each equation included two dummy (1-0 dichotomous) variables representing participation in Head Start (coded 1) and participation in other preschool (coded 1), with non-participation in both being the omitted category. (A parallel second set of equations was also run with "other preschool" being the omitted category permitting appropriate statistical comparisons between the Head Start and other preschool group). The results presented here are limited to the program coefficients for ease of presentation. The reader should be aware, however, that these are regression coefficients from equations which included all of the other explanatory variables, and that their effects are thus net of all these other factors. The meaning of these coefficients, particularly when they are statistically significant, should be subjected to careful interpretation. If all other factors in the child's life were being appropriately considered, these coefficients would represent the "effects" of Head Start participation on the child's development during the period. However, if there are other concurrent unmeasured factors which are paralleling Head Start in their effects on the child, a Head Start effect may well be proxying for some other unknown factor. For example, if mothers who send their child to Head Start are either more or less likely to provide special assistance to their children, then an unmeasured "mother effect"

may appear in our equation as a Head Start effect. In addition, and perhaps more importantly, even if a particular effect is linked with Head Start, the specific explanation for the effect is beyond the scope of this data set and this research. For example, a negative behavioral effect associated with the Head Start coefficient could theoretically reflect not only unmeasured home or other effects or some direct program effect, but also (and perhaps most likely) may reflect the likelihood that the average child in a Head Start program has a greater initial level of behavior problems (already documented in Table 9) and thus is thrown into an environment of peers who on average have a greater level of problem behaviors. Thus, linkages between increasing behavior problems and Head Start may reflect peer interaction effects and not program effects.

Table 10 includes coefficients measuring the independent associations between program participation and child development for all the children in the sample as well as for those children most in need of assistance, children from families which in 1987 had family incomes less than \$15,000. Table 11 then explores further whether or not any measurable program effects might be linked with how long a child is in the program, as there is evidence from other studies which suggests the greater value of longer program involvement.

The top panel of Table 10 suggests that there are some significant, albeit substantively modest, associations between Head Start program participation and the the specified dimensions of child development. Head Start participants marginally increased their scores on the Behavior Problem Index (by three percentile points) compared with children not enrolled in any preschool program. However, there was no significant difference in 1986-1988 score changes between Head Start participants and children in other preschool programs. A careful examination of the associated subscores indicates that, compared to children not enrolled in any program, Head Start participants became slightly more headstrong (4 percentile points)

and hyperactive (about 4 percentile points). On all the other subscales, (i.e., antisocial, anxious-depressed, dependency and peer conflict), Head Start participants showed no significant change compared either with children in other preschool programs or children not enrolled in any program. It should be emphasized that, substantively, the changes which were noted are modest in scope. In addition, caution should be exercised when interpreting these results; whether they represent changes linked with non-program environment, within-program peer interaction or actual program effects remains unclear. Also, of the six component subscales, it is suggested that modest changes in being headstrong or hyperactive would appear to be behaviorally less significant than would be changes in the other subscales.

With regard to the literature, there are only a handful of studies that address the issue of Head Start impacts on socioemotional development with which it is possible to draw comparisons. The vast majority of studies focus instead on cognitive impacts associated with Head Start participation. This has been attributed to the misconception that Head Start was primarily intended to enhance the cognitive abilities (and later performance in school) of underprivileged children, and the fact that socioemotional development is a difficult phenomenon to measure (Zigler and Rescorla, 1985). Reviews of the available literature suggest that while Head Start participants usually perform as well as their peers in terms of social development, they have also been found to be more aggressive and assertive than their peers (Hubbell et al., 1983; McKey et al., 1985).

With regard to the Temperament subscales, program participation whether in Head Start or in other preschool programs, is associated (at least in the short run) with increasing insecurity in comparison with children not participating in any program.

In contrast with their performance on the Behavior Problems subscales described above, Head Start participants evidenced some apparent improvement in their reading skills (compared with other preschool and non-program participants) in reading comprehension and,

marginally, (compared with non-program children) on reading recognition. (The reader is reminded that the change measure under consideration compares 1986 Peabody Picture Vocabulary test scores with 1988 PIAT reading recognition and comprehension scores.) As with the Behavior Problem results, the changes are modest, ranging between 3 and 5 percentile points.

An initial review of the literature dealing with intermediate-term (i.e., follow-up through second grade) cognitive impacts associated with Head Start participation yields mixed results. It is possible to find studies reporting that Head Start participants score significantly higher than their peers, the same as their peers, or significantly lower than their peers on some achievement tests. Upon closer examination, however, it is apparent that much of this variation is at least in part an artifact of questionable research design; control groups were, in many instances, composed of children who were more advantaged in terms of family income, parental education, etc. Overall, however, our findings parallel those of other researchers who have found that Head Start does seem to have a positive impact on the cognitive abilities of participants. (See, for example, Royster et al., 1978.)

Thus, after controlling for a full range of factors which might be considered to be linked with program participation and child development, we have presented some modest evidence that Head Start participation may, on average, be associated with some very modest improvements in cognitive reading skills and perhaps has some very modest negative implications for some behavior problems dimensions. For the most part, measured program effects (along the dimensions we have considered) would appear to be benign.

In the bottom panel of Table 10, we have considered separately potential program effects for children presumably most in need of program assistance, those who were being raised in families which had annual incomes below \$15,000. The patterns of effects for these children are, in general, similar to those for the full group of children, but in some instances are somewhat

more pronounced. Specifically, the positive reading effects for Head Start participants in comparison with non-participants are somewhat larger with measurable percentile improvements of between five and six points compared with 3 to 4 points overall. Conversely, the potential negative behavioral effects are also slightly greater but generally similar in nature.

Table 11 is designed to clarify, to the extent the data permit, whether there is any systematic evidence of significant effects being associated with the duration of time a child has spent in the program. While the patterns are in some instances erratic, several potentially important results may be noted. When comparing Head Start participants with children not in any program (the top panel of Table 11), there is clear systematic evidence of negative behavioral problem linkages with short-term program involvement. That is, children who participated in Head Start for less than one year were significantly above average in behavioral problem determinants compared with children not in any program during the 1986-1988 interval and also (middle panel) above average when compared with children who had participated in other (non-Head Start) programs. For both these comparisons, significant coefficients were found for the Headstrong, Hyperactive and Dependency subscales. In addition, the effects are nontrivial, typically attaining six to eight percentile points. It is important to emphasize that potential causes behind this pattern are ambiguous. For example, it may well be that children who enroll in Head Start and evidence shorter-term difficulties are less likely to remain in the program. If this is the case, everything else being equal, one would anticipate an association between short-term enrollment and (selected) problem behaviors. If this interpretation is correct, it would also suggest that parents who have children with problem behaviors are more likely to enroll them in Head Start than in other preschool programs, as evidenced by the significant coefficients in the Head Start versus the preschool program comparisons.

The bottom panel of Table 11 provides a direct comparison of the "effects" of longer program participation compared with shorter participation. These coefficients are from similar

equations in which the samples are limited to children who have participated in Head Start. It suggests that compared to short term (under one year) participants, children who stay in the program longer show more behavioral improvement (for whatever reason). Specifically, children who participated for two or more years showed significant declines in being "anxious-depressed", "hyperactive" and "dependent" compared with short-term participants. In addition, for the most part, children who participated for one year appeared to fare better than the less than one year group, although the coefficients generally did not attain statistical significance.

In contrast with the above behavioral dimensions, changes in reading cognition did not appear to be systematically linked with duration of participation in Head Start. Children in the program for shorter time periods seem to improve at about the same rate as longer term participants. This lack of significance appear to be consistent with any of the following hypotheses: (1) there is something inherently consistent with participation in the program per se (e.g. improved social interaction with outsiders in a threatening intervening situation) which contributes to better test performances on a reading test; or (2) for some reason Head Start selects children with above average potential for improving their reading skills (perhaps because their beginning level of achievement is so far below average).

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**TABLE 1. PERCENT OF ALL N.L.S.Y. CHILDREN (AGE 3 AND OVER)  
EVER ENROLLED IN HEADSTART BY RACE/ETHNICITY AND SELECTED CHARACTERISTICS**

(Weighted Estimates)

	TOTAL	White	Black	Hispanic
<b>Maternal Education, 1988</b>				
Less than 12 Years	16.8 (3343)	9.5 (1603)	36.5 (1147)	22.3 (593)
12 Years	22.6 (1322)	16.6 (595)	35.9 (415)	27.9 (312)
13 Years and Over	14.5 (1362)	7.2 (699)	40.0 (472)	18.0 (191)
	12.7 (659)	4.6 (309)	31.6 (260)	22.4 (90)
<b>Mother Ever in Head Start?</b>				
Yes	42.5 (827)	27.7 (262)	48.8 (431)	33.9 (134)
No	14.0 (2516)	8.8 (1341)	31.4 (716)	21.3 (459)
<b>Mother's AFQT Score</b>				
Bottom Third	29.8 (1127)	18.9 (271)	38.5 (586)	26.9 (270)
Middle Third	20.5 (1090)	12.4 (472)	38.5 (405)	22.6 (213)
Top Third	7.7 (1126)	6.3 (860)	24.5 (156)	11.2 (110)
<b>Mother's Age at Birth of Child</b>				
Under 16	34.1 (79)	-- (21)	27.2 (52)	-- (6)
16-19	23.1 (1271)	13.3 (526)	40.3 (521)	26.8 (224)
20-24	13.9 (1705)	7.9 (878)	34.7 (512)	19.5 (315)
25 and Over	9.6 (288)	6.0 (178)	28.6 (62)	18.1 (48)
<b>Child's PPVT Score, 1986</b>				
Bottom Third	30.1 (1048)	19.3 (213)	38.3 (571)	25.4 (264)
Middle Third	17.5 (1099)	10.0 (514)	37.0 (399)	17.0 (186)
Top Third	10.1 (1196)	7.6 (876)	29.8 (177)	23.9 (143)
<b>Family Income, 1987</b>				
Under \$10,000	33.5 (869)	23.6 (292)	44.5 (430)	34.7 (147)
\$10,000-\$14,999	20.7 (444)	12.5 (202)	36.0 (162)	26.6 (80)
\$15,000-\$24,999	17.5 (582)	10.1 (292)	38.8 (184)	20.9 (106)
\$25,000 and Over	6.9 (1000)	4.3 (648)	23.5 (185)	15.9 (167)

*Note:* Sample Size in Parentheses

**TABLE 2. DURATION OF HEAD START ENROLLMENT BY SELECTED CHARACTERISTICS:  
ALL CHILDREN WHO HAVE COMPLETED HEADSTART PROGRAM**

(Weighted Estimates)

	RACE/ETHNICITY			MATERNAL EDUCATION			P.P.V.T. SCORE (1986)		
	TOTAL	White	Black	Hispanic	Less than 12 Years	12 Years or More	Bottom Third	Middle Third	Top Third
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under One Year	34.3	40.7	29.6	34.0	37.9	36.2	32.0	32.1	40.4
One Year	38.8	37.9	38.0	45.1	43.0	32.6	41.5	35.4	39.1
Two or More Years	26.9	21.4	32.4	20.9	24.1	31.2	26.5	32.6	20.6
Sample Size	789	243	419	127	367	294	347	265	177



**TABLE 4. PERCENT OF FOUR THROUGH SIX YEAR OLD N.L.S.Y. CHILDREN  
EVER ENROLLED IN HEADSTART BY RACE/ETHNICITY AND SELECTED CHARACTERISTICS**

(Weighted Estimates)

	TOTAL	White	Black	Hispanic
Maternal Education, 1988	15.5 (1320)	9.5 (618)	34.0 (448)	18.4 (254)
Less than 12 Years	21.4 (507)	18.3 (222)	30.1 (157)	19.8 (128)
12 Years	12.7 (576)	6.4 (292)	36.4 (195)	16.9 (89)
13 Years and Over	12.9 (237)	4.1 (104)	35.5 (96)	17.0 (37)
Mother Ever in Head Start?				
Yes	39.1 (195)	19.5 (28)	48.1 (142)	16.8 (25)
No	13.1 (1125)	9.2 (590)	27.8 (306)	18.5 (229)
Mother's AFQT Score				
Bottom Third	26.6 (450)	18.9 (103)	33.3 (230)	23.6 (117)
Middle Third	19.7 (431)	12.8 (183)	38.5 (159)	17.4 (89)
Top Third	7.7 (439)	6.2 (332)	24.8 (59)	7.8 (48)
Mother's Age at Birth of Child				
Under 16	-- (5)	-- (2)	-- (3)	-- (0)
16-19	23.3 (463)	16.3 (175)	38.8 (199)	19.3 (89)
20-24	12.3 (832)	7.3 (434)	30.3 (239)	18.5 (159)
25 and Over	-- (20)	-- (7)	-- (7)	-- (6)
Child's PPVT Score, 1986				
Bottom Third	25.3 (418)	16.6 (73)	32.5 (228)	19.6 (117)
Middle Third	17.6 (435)	11.4 (203)	35.5 (151)	18.6 (81)
Top Third	9.7 (467)	7.5 (342)	35.6 (56)	15.6 (56)
Family Income, 1987				
Under \$10,000	28.1 (332)	21.1 (116)	37.1 (152)	31.4 (64)
\$10,000-\$14,999	15.7 (184)	8.6 (81)	32.7 (69)	12.3 (34)
\$15,000-\$24,999	20.8 (255)	13.4 (123)	47.8 (79)	14.1 (53)
\$25,000 and Over	5.8 (373)	4.2 (245)	17.4 (69)	12.4 (59)

Note: Sample Size in Parentheses

**TABLE 5. PERCENT OF FOUR THROUGH SIX YEAR OLD N.L.S.Y. CHILDREN  
(1) EVER ENROLLED IN HEADSTART; (2) EVER ENROLLED IN OTHER PRESCHOOL PROGRAMS; AND  
(3) ENROLLED IN NEITHER HEADSTART OR OTHER PRESCHOOL BY SELECTED CHARACTERISTICS**

(Weighted Estimates)

	PERCENT ENROLLED IN			Total	Sample Size
	Headstart	Other Preschool	No Program		
Maternal Education, 1988	15.5	43.4	41.1	100.0	1320
Less than 12 Years	21.4	24.6	54.0	100.0	507
12 Years	12.7	48.2	39.1	100.0	576
13 Years and Over	12.9	63.0	24.1	100.0	237
Mother Ever in Head Start?					
Yes	39.1	24.0	36.9	100.0	195
No	13.1	45.5	41.4	100.0	1125
Mother's AFQT Score					
Bottom Third	26.6	25.7	47.7	100.0	450
Middle Third	19.7	39.7	40.6	100.0	431
Top Third	7.7	63.2	29.1	100.0	439
Mother's Age at Birth of Child					
Under 16	--	--	--	100.0	5
16-19	23.3	34.7	42.0	100.0	463
20-24	12.3	46.8	40.9	100.0	832
25 and Over	--	--	--	100.0	20
Child's PPVT Score, 1986					
Bottom Third	25.3	32.2	42.5	100.0	418
Middle Third	17.6	41.4	40.0	100.0	435
Top Third	9.7	49.2	41.1	100.0	467
Family Income, 1987					
Under \$10,000	28.1	34.9	37.0	100.0	332
\$10,000-\$14,999	15.7	34.9	49.4	100.0	184
\$15,000-\$24,999	20.8	32.6	46.6	100.0	255
\$25,000 and Over	5.8	56.2	38.0	100.0	373

**TABLE 6. CHARACTERISTICS OF HEADSTART ELIGIBLE CHILD SAMPLE**

(Weighted Estimates)

Percent Black	20.6
Percent Hispanic	9.1
Percent White	70.3
Percent Male	53.5
Maternal Mean (raw) AFQT Score	64.0
Mean Children in Household	1.5
Percent of Children Living with Father	56.3
Maternal Mean Age at First Birth	19.2
Percent Living in Urban Areas	72.1
Percent Living in Northeast Region	13.9
Percent Living in North Central Region	30.3
Percent Living in South Region	39.1
Percent Living in West Region	16.7
Maternal Mean Years of Schooling	11.6
Percent with Family Income < \$10,000	18.5
Percent with Family Income \$10,000 - \$14,999	11.1
Percent with Family Income \$15,000 - \$24,999	17.7
Percent with Family Income > \$25,000	40.6
Percent of Mothers who had attended Headstart	9.1
Average (mean) Household Size	4.4

**TABLE 7. THE DETERMINANTS OF HEADSTART AND OTHER PRESCHOOL PARTICIPATION  
FOR CHILDREN ELIGIBLE FOR HEADSTART IN 1986: LOGIT ESTIMATES**

	<b>In Headstart 1986-1988 = 1 Other = 0</b>	<b>In Other Preschool 1986-1988 = 1 Other = 0</b>	<b>No Preschool Participation = 1 Other = 0</b>
Black	0.55 <sup>a</sup>	-0.43 <sup>b</sup>	-0.06
Hispanic	-0.31	-0.08	0.33 <sup>c</sup>
Male	0.15	0.001	-0.10
Maternal AFQT Score	-0.001 <sup>a</sup>	0.001 <sup>a</sup>	-0.00
Birth Order (continuous)	0.02	-0.25 <sup>b</sup>	0.16 <sup>c</sup>
Father in Household	-0.29 <sup>c</sup>	0.02	0.21
Mother's Age at Birth	-0.04	0.04	-0.03
Urban Residence	0.13	0.83 <sup>a</sup>	-0.82 <sup>a</sup>
Northeast Region of Residence	0.24	-0.26	0.02
North Central Region of Residence	0.14	-0.58 <sup>a</sup>	0.43 <sup>a</sup>
Last Region of Residence	0.40 <sup>c</sup>	-0.28	-0.05
Maternal Highest Grade of School	0.04	0.15 <sup>a</sup>	-0.16 <sup>a</sup>
Family Income not known	0.60 <sup>b</sup>	-0.15	-0.02
Family Income less than \$10,000	1.05 <sup>a</sup>	-0.71 <sup>a</sup>	0.08
Family Income \$10,000 to \$14,999	0.63 <sup>b</sup>	-0.66 <sup>a</sup>	0.37 <sup>c</sup>
Family Income \$15,000 to \$24,999	1.23 <sup>a</sup>	-0.76 <sup>a</sup>	0.02
Mother had been in Headstart	0.71 <sup>a</sup>	-0.56 <sup>a</sup>	-0.27
Mother's Headstart Status not known	-1.04	0.14	0.26
Household Size	-0.01	-0.20 <sup>a</sup>	0.15 <sup>a</sup>
Intercept	-1.47	-2.29 <sup>a</sup>	1.42 <sup>c</sup>
Chi Square	155 <sup>a</sup>	219 <sup>a</sup>	139 <sup>a</sup>
Sample Size	1255	1255	1255

*Note:* Categories noted in Table are all coded one with omitted category coded zero; omitted region of residence is South, omitted Family Income category is \$25,000 and over; omitted Race category is White.

<sup>a</sup> = significant at P < .01

<sup>b</sup> = significant at P < .05

<sup>c</sup> = significant at P < .10

**TABLE 8. THE DETERMINANTS OF HEAD START PARTICIPATION BETWEEN 1986 AND 1988  
FOR CHILDREN ELIGIBLE FOR HEAD START IN 1986 BY RACE/ETHNICITY AND INCOME**

(Logit Estimates)

	Family Income Less than \$15,000	Total Race All Incomes	Hispanic	Black	White
Black	0.34	0.55 <sup>a</sup>	--	--	--
Hispanic	-0.08	-0.31	--	--	--
Male	0.31	0.15	0.07	0.14	0.35
Maternal AFQT Score	-0.001	-0.001 <sup>a</sup>	-0.000	-0.000	-0.002 <sup>c</sup>
Birth Order (continuous)	-0.10	0.02	-0.25	0.10	-0.02
Father in Household	-0.16	-0.29 <sup>a</sup>	0.02	-0.20	-0.05 <sup>b</sup>
Mother's Age at First Birth	-0.08	-0.04	-0.16	0.02	-0.07
Urban Residence	0.21	0.13	1.24	0.12	-0.35
Northeast Region of Residence	0.26	0.24	0.14	0.07	0.39
North Central Region of Residence	0.34	0.14	-0.50	0.47 <sup>c</sup>	-0.02
Last Region of Residence	0.10	0.40 <sup>c</sup>	0.12	0.17	0.83 <sup>b</sup>
Maternal Highest Grade of School	0.09	0.04	0.03	0.08	-0.05
Family Income not known	0.006	0.60 <sup>b</sup>	0.46	0.71	0.39
Family Income less than \$10,000	0.45 <sup>c</sup>	1.05 <sup>a</sup>	0.43	0.98 <sup>b</sup>	1.28 <sup>a</sup>
Family Income \$10,000 to \$14,999	--	0.63 <sup>b</sup>	-0.70	0.72	0.93 <sup>b</sup>
Family Income \$15,000 to \$24,999	--	1.23 <sup>a</sup>	-0.09	1.63 <sup>a</sup>	1.30 <sup>a</sup>
Mother had been in Headstart	0.64 <sup>a</sup>	0.71 <sup>a</sup>	-0.29	0.86 <sup>a</sup>	0.75 <sup>a</sup>
Mother's Headstart Status not known	-1.03	-1.04	--	0.32	--
Household Size	-0.05	-0.01	-0.13	-0.04	0.16
Intercept	-0.63	-1.47	1.95	-3.06 <sup>b</sup>	-0.40
Chi Square	52.44 <sup>a</sup>	1.55 <sup>a</sup>	17.18	42.83 <sup>a</sup>	73.89 <sup>a</sup>
Sample Size	653	1255	238	418	599



TABLE 9. 1986 BEHAVIOR AND COGNITIVE ASSESSMENT SCORES FOR: 1) CHILDREN PARTICIPATING IN HEAD START; 2) CHILDREN PARTICIPATING IN OTHER PRESCHOOL PROGRAMS; AND 3) CHILDREN NOT PARTICIPATING IN ANY PROGRAMS BETWEEN THE 1986 AND 1988 SURVEY ROUNDS

Weighted Estimates

MEAN SCORES (1986 ASSESSMENT)										
	BEHAVIOR PROBLEMS PERCENTILE	BEHAVIOR PROBLEMS SUBSCALE PERCENTILE SCORES				Peer Conflict	PPVT PERCENTILE SCORE	TEMPERAMENT SUBSCALE RAW SCORES		
		Anti-Social	Anxious-Depressed	Head-Strong	Hyper-Active			Compliance	Insecure Attachment	Social-bility
Head Start Children	67.8	66.1	65.2	56.2	70.1	65.9	62.9	22.2	19.6	11.7
Other Preschool Children	65.1	60.7	60.5	60.0	67.6	62.2	58.7	23.8	18.4	11.9
Non-preschool Children	64.6	62.0	59.6	58.1	67.5	62.0	59.9	23.9	18.6	12.0

Note: Sample includes children who were 4 to 6 years of age in 1986 and had valid scores on all of the assessment items reported above.

TABLE 10. LINKAGE BETWEEN HEADSTART OR OTHER PRESCHOOL PROGRAM ENROLLMENT AND CHANGES IN BEHAVIOR PROBLEMS OR COGNITIVE DEVELOPMENT TEST SCORES:  
CHILDREN ELIGIBLE TO BE IN HEADSTART BETWEEN 1986 AND 1988 SURVEY ROUNDS  
(Ordinary Least Square Analysis)

CHANGE in Percentile Score associated with Program Participation in Interval

	Behavior Problems	Anti-social Subscore	Anxious Depressed Subscore	Head-strong Subscore	Hyper-active Subscore	Depen-dency Subscore	Peer Conflict Subscore	PIAT Reading Recognition 88 - PPVT Score 86	Reading Com-prehension 88 - PPVT Score 86	Temperament Secure Attach. Subscore	Tempera-ment Soci-ability Subscore	
Headstart vrs. Other Preschool	1.52	0.35	-1.26	3.73 <sup>c</sup>	2.88	1.36	-1.44	-1.91	-4.82 <sup>b</sup>	-0.04	-0.75	0.57
Headstart vrs. no Preschool	3.11 <sup>c</sup>	2.33	3.00	4.33 <sup>b</sup>	3.78 <sup>b</sup>	1.55	2.50	-3.44 <sup>c</sup>	-4.10 <sup>b</sup>	0.43	-2.23 <sup>a</sup>	0.47
Other Preschool vrs. no Preschool	1.69	2.00	4.22 <sup>b</sup>	0.60	0.90	0.19	3.94 <sup>b</sup>	-1.53	0.72	0.48	-1.49 <sup>b</sup>	-0.09
Families Under \$15,000												
Headstart vrs. other preschool	-0.03	1.61	-4.87 <sup>b</sup>	3.59	-0.78	-0.19	-1.05	3.63	4.51	-0.61	1.56	-0.61
Headstart vrs. no preschool	3.78 <sup>c</sup>	4.54 <sup>c</sup>	3.20	5.21 <sup>b</sup>	3.70	3.64	2.11	5.79 <sup>b</sup>	5.45 <sup>b</sup>	-0.91	2.75 <sup>b</sup>	-0.22
Other preschool vrs. no preschool	3.80 <sup>c</sup>	2.93	8.07 <sup>a</sup>	1.62	2.92	3.83	3.15	2.16	0.54	-0.30	1.19	0.39

a = significant at P < .01

b = significant at P < .05

c = significant at P < .10

Coefficients are from equations which include all the explanatory variables included in Table 7. Temperament scores are non-normed raw scores.

TABLE 11. TEST SCORE CHANGES BETWEEN 1986 TO 1988 IN RELATIONSHIP TO DURATION IN PROGRAM  
CHANGE in Percentile Score associated with Program Participation in Interval

	Behavior Problems	Anti-social	Anxious Depressed	Head-strong	Hyper-active	Dependancy	Peer Conflict	PIAT Reading Recognition 86	Reading Comprehension 86	Temperament Compliance Subscore	Temperament Secure Attach. Subscore	Temperament Sociability Subscore
Children: Head Start vs. No Headstart												
Duration Under One Year	7.51 <sup>a</sup>	4.59	4.35	6.75 <sup>b</sup>	8.58 <sup>a</sup>	7.30 <sup>b</sup>	1.68	2.82	4.78	-0.40	2.51 <sup>a</sup>	-0.97
Duration of One Year	1.69	2.21	5.16 <sup>b</sup>	1.29	2.45	-1.32	4.57 <sup>c</sup>	3.16	3.07	-1.33	0.87	-1.01
Duration of Two or More Years	0.24	0.39	-2.75	6.91	0.81	-0.43	0.28	4.64	4.64	0.72	3.67 <sup>c</sup>	0.73
Children: Head Start vs. Other Preschool												
Duration Under One Year	5.91 <sup>b</sup>	2.63	0.14	6.13 <sup>b</sup>	7.67 <sup>a</sup>	7.03 <sup>b</sup>	-2.22	1.30	5.50 <sup>c</sup>	0.05	1.02	-1.08
Duration of One Year	0.09	0.25	0.95	0.66	1.54	-1.59	0.68	1.64	3.79	-0.87	-0.62 <sup>c</sup>	-1.11
Duration of Two or More Years	-1.15	-1.58	-6.96 <sup>b</sup>	6.29	-0.10	-0.70	-3.61	3.12	5.36	1.18	2.17 <sup>c</sup>	0.62
Children in Head Start <sup>1</sup>												
Duration of One Year	-3.62	-1.13	0.75	-4.28	-4.57 <sup>b</sup>	-8.42 <sup>b</sup>	1.09	-0.27	-3.21	0.50	-2.35	0.20
Duration of Two or More Years	-5.84	-2.58	-6.76 <sup>c</sup>	0.54	-8.43 <sup>b</sup>	-8.14	-1.82	1.86	0.86	1.31	1.89	1.50

Note: See Table 10

<sup>1</sup> Reference group is children who were in Head Start less than a year

## **APPENDIX 1A: Component Items of the Behavior Problem Scale and Subscales**

The Behavior Problems Index Assessment was completed by all mothers of children age four years or over. There are 28 individual items, of which the final two are completed only for children who have ever attended school. The 28 items included in the scale translate into one overall score and six subscores tapping various dimensions of child adjustment. Before scoring, the individual items are recoded such that code 3 ("not true") in the questionnaire becomes "0" and code 1 ("often true") or 2 ("sometimes true") becomes "1." Higher scores on this index imply a greater level of behavioral problems.

In addition to the overall and six raw subscores, normed scores have been constructed based on data from the 1981 National Health Interview Survey. These normed scores are based on single year of age data. For children below the age of six, separate norms are computed for children in and out of school. Given the limited number of possible responses for some of the subscores, the user is cautioned that the range of normed outcomes for some of the subscores is quite constrained.

The following 28 items are all components of the overall Behavior Problems Index with the last two items only asked for children who are in school. Items included in the six subscales are specified by the notation to the right; ANTI = Antisocial subscore, ANX = Anxious-Depressed, HEAD = Headstrong, HYP = Hyperactive, DEP = Dependent, and PEER = Peer Conflict, Withdrawal subscore.

- |  |        |
|--|--------|
| 1. He/She has sudden changes in mood or feeling.                       | (ANX)  |
| 2. He/She feels or complains that no one loves him/her.                | (ANX)  |
| 3. He/She is rather high strung, tense and nervous.                    | (HEAD) |
| 4. He/She cheats or tells lies.  | (ANTI) |
| 5. He/She is too fearful or anxious.                                   | (ANX)  |
| 6. He/She argues too much.   | (HEAD) |
| 7. He/She has difficulty concentrating, cannot pay attention for long. | (HYP)  |
| 8. He/She is easily confused, seems to be in a fog.                    | (HYP)  |
| 9. He/She bullies or is cruel or mean to others.                       | (ANTI) |
| 10. He/She is disobedient at home.                                     | (HEAD) |
| 11. He/She does not seem to feel sorry after he/she misbehaves.        | (ANTI) |
| 12. He/She has trouble getting along with other children.              | (PEER) |

- |     |  |        |
|-----|--|--------|
| 13. | He/She is impulsive, or acts without thinking.   | (HYP)  |
| 14. | He/She feels worthless or inferior.  | (ANX)  |
| 15. | he/She is not liked by other children.   | (PEER) |
| 16. | He/She has a lot of difficulty getting his/her mind off certain thoughts (has obsessions). | (HYP)  |
| 17. | He/She is restless or overly active, cannot sit still.                                     | (HYP)  |
| 18. | He/She is stubborn, sullen, or irritable.  | (HEAD) |
| 19. | He/She has a very strong temper and loses it easily.                                       | (HEAD) |
| 20. | He/She is unhappy, sad, or depressed.  | (ANX)  |
| 21. | He/She is withdrawn, does not get involved with others.                                    | (PEER) |
| 22. | He/She breaks things on purpose or deliberately destroys his/her own or another's things.  | (ANTI) |
| 23. | He/She clings to adults.   | (DEP)  |
| 24. | He/She cries too much.   | (DEP)  |
| 25. | He/She demands a lot of attention.   | (DEP)  |
| 26. | He/She is too dependent on others.   | (DEP)  |
| 27. | He/She is disobedient at school.   | (ANTI) |
| 28. | He/She has trouble getting along with teachers.  | (ANTI) |

This scale was created by Drs. Nicholas Zill and James Peterson of Child Trends Inc., Washington D.C. to measure the frequency, range and type of childhood behavior problems. Many items were derived from the Achenbach Behavior Problems Checklist (Achenbach & Edelbrock, 1981) and other child behavior scales (Graham & Rutter, 1968; Rutter, Tizard & Whitmore, 1970; Kellam et al, 1975; Peterson & Zill, 1986).

## **APPENDIX 1B: The Temperament Compliance, Secure Attachment and Sociability Subscales**

The Temperament scales were developed based on measures from a variety of sources including Rothbart's Infant Behavior Questionnaire (Rothbart and Derryberry, 1984), Campos and Kagan's compliance scale, and other items selected by Joseph J. Campos. It represents an amalgam of mother and interviewer reports tapping a wide range of child traits and its reliability and validity are described more fully in Baker and Mott, 1989.

Temperament is related to the child's impact on family members, and is linked with the development of behavioral problems (Bates, 1980). The Temperament scales selected for this study include dimensions of sociability, compliance and secure attachment--factors which are components of Thomas' easy-difficult temperament construct and which are precursors to personality development and social adjustment, social relations, and performance on tests such as the Motor and Social Development Scale and PPVT-R (e.g. Lamb, 1982).

The subscores are simple composites of the individual items included in the three subscales, which are listed below. Each individual item is scored from one ("almost never") to five ("almost always").

### **(A) Compliance Subscale**

1. When it is mealtime, how often does your child eat what you want him/her to eat?
2. When your child doesn't eat what you want him/her to eat and you tell him/her to do so, how often does he/she obey and eat?
3. When it is your child's bedtime, how often does he/she protest or resist going to bed? (Codes reversed.)
4. When he/she does protest and you tell him/her again to go to bed, how often does he/she do so?
5. When you tell your child to turn off the TV, how often does he/she do so without protest?
6. When he/she does protest and you tell him/her again to turn off the TV, how often does he/she do so?

### **(B) Secure Attachment Subscale**

1. How often do you have trouble soothing or calming your child when he/she is upset?
2. When your child is playing, how often does he/she stay close to you and make sure that he/she can still see you?

3. How often does he/she try to copy what you do or how you act? (You may not always allow him/her to do this.)
4. When you leave the room and leave your child alone, how often does he/she get upset?
5. How often is your child demanding and impatient even when you are busy?
6. When you get upset about something, how often does your child get worried, or try to help, or make you feel better?
7. How often does your child want you to help with the things he/she is doing?

**(C) Sociability**

How was child's? (Five point scale; 1 = Poor to 5 = Excellent)

1. Attitude toward being tested?
2. Rapport with interviewer?
3. Cooperation?

## **APPENDIX 1C: PPVT-R and PIAT Assessments**

These are well established universally accepted assessments. They are well normed and standardized and the children in this study have had their raw scores normed against age-appropriate national samples.

For a precise statement of the scoring decisions and of the norm derivations, the user should consult Dunn, L.M., and Dunn, L.M. *PPVT - Revised Manual*, Circle Pines, Minnesota: American Guidance Service, 1981 (pp 96-110; 126) and Dunn, L.M. and Markwardt, F.C., *PIAT Manual*, Circle Pines, Minnesota: American Guidance Service, 1970 (pp 81-91; 95). In addition, Baker and Mott (1989) include a detailed statement of how these assessments were administered to the NLSY children.