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**Maternal Age at First Birth and
Children's Behavior and Cognitive Development**

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Profound changes in the family situations in which American children are raised have aroused interest and concern about the well-being of children in both the scholarly and policy arenas (Preston, 1984; Duncan and Rogers, 1988; Zill and Rogers, 1988; Eggebeen and Lichter, 1991; Duncan, 1991). One group of particular concern are the children born to young parents (e.g., Johnson and Sum, 1992). Evidence has shown that the children of teen parents are at greater risk of health, intellectual, behavioral, and academic difficulties than are children of older parents (e.g., Baldwin and Cain, 1980; Brooks-Gunn and Furstenberg, 1986; Hayes, 1987)¹. However, researchers are only beginning to understand the factors that enhance or undermine the well-being of the children of teenage mothers. Not all children born to young mothers do poorly, and efforts have been made to identify why some children of adolescent mothers have difficulties while others function competently (e.g., Furstenberg et al., 1987; Moore, 1986; Dubow and Luster, 1990; Moore and Snyder, 1991). Because teenage childbearing does not occur randomly among the population of young women, and since the life courses of early childbearers tend to differ from those who delay motherhood (Card and Wise, 1978; Dillard and Pol, 1982), age at first birth is inevitably a proxy for other factors. Among these may be a disadvantaged family background; youthful immaturity; poor nutrition and a lack of prenatal care; low educational attainment; economic hardship; poor educational and employment opportunities; and marital instability; all of which have been shown to affect the well-being of children. Indeed, the direct effect of an early first birth appears to be quite

small based on available evidence (Card, 1978; Marecek, 1979; Mednick and Baker, 1980; Moore and Snyder, 1991).

Evaluating the consequences of being born to a young mother thus requires that one sort out the intervening processes through which the mother's age at the time of the birth may affect the child. Family structure, maternal education, and family size are prominent among the mechanisms through which researchers have found the mother's age at first birth to indirectly affect child well-being (see Hofferth, 1987 for review). Other factors such as the receipt of public assistance, the level of support from the young mother's parents, the amount of father involvement, and the parenting behaviors of the adolescent mothers themselves have also been explored (e.g., Furstenberg et al., 1987; Wasserman et al., 1990). Moore and Snyder (1991) found that environmental factors, such as the degree of intellectual stimulation in the home predicted children's cognitive test performance. In a study of 8 to 15 year olds, Dubow and Luster (1990) documented that the risk of developing problems among children of teen mothers increased linearly with the number of risk factors, such as poverty and low maternal education, to which children were exposed.

The aim of this paper is to further illuminate the processes through which an early birth affects child well-being. Since it is not possible to capture the developmental status and well-being of a child with a single indicator, such as an IQ score, most child experts prefer a developmental profile that covers a breadth of dimensions or domains (Zill and Coiro, 1992). For this reason, we examine the effect of the mother's age at first birth on three measures related to the child's cognitive development and academic achievement -- the reading and mathematics sub-scales of the Peabody Individual Achievement Test (PIAT), and the Peabody Picture Vocabulary Test (PPVT) -- and one

measure of social behavior -- the child's score on the mother-rated Behavior Problems Index (BPI). We use a national-level sample of children aged from 5 to 8, and limit our analysis to first-borns to eliminate the possible confounding influence of birth order.

The explicit assumption of the present study is that any consequences of being born to a teenage mother do not derive from the mother's age per se, but are largely the product of the correlates of early childbearing such as low maternal education and father absence, some of which reflect selectivity into early motherhood and some of which are consequences of the timing of her first birth. Because we hypothesize that the effects of an early birth flow through multiple pathways of influence, a structural equation model provides an appropriate analytic framework.

CONCEPTUAL MODEL

The factors that influence child well-being are numerous and complex, but most disciplinary approaches from the status attainment tradition within sociology to the field of developmental psychology recognize the critical contribution of parents to children's socio-emotional, cognitive, physical and behavioral development. Recently, in fact, two-generational approaches have become a fairly explicit and visible program intervention strategy. An increasing number of demonstration projects seeking to improve the developmental outcomes of at-risk children are attempting to restructure the major systems that touch the lives of vulnerable *families* (Smith et al., 1992). In addition, researchers have begun to explore the effects upon children of programs designed to have an impact on mothers (Zaslow, Moore, and Zill, 1991). Thus, it is useful to explore the factors

related to a young mother's life course that may affect her child's well-being and which could be amenable to intervention.

As illustrated in Figure 1, there are multiple mechanisms through which age at first birth is hypothesized to affect child well-being. The first set of factors relates to the quantity of time that the mother has to invest in the parenting role. The psychological literature underscores the importance of frequent high-quality interactions between mother and child in order to provide the stimulation necessary for cognitive development and the emotional warmth necessary for emotional development. A topic of keen interest and controversy in recent years is the effect of maternal employment on the intellectual ability and well-being of children (Desai et al., 1989; Milne et al., 1986; Heyns and Catsambis, 1986; Baydar and Brooks-Gunn, 1991). Concerns relate to whether the amount of parent-child interaction is affected by the constraints that outside work pose on the mother's time and on her level of stress due to task overload (Epstein, 1988; Desai et al., 1989). A related issue is the quality of the child care arrangements to which the children of working mothers are exposed (National Research Council, 1990). Alternatively, work outside of the home may enhance the mother's sense of self esteem and her wages may determine whether her family falls below the poverty line or receives public assistance. The number of children present in the family may also dilute the amount of parental time available to any one child. Since women who become mothers at young ages are likely to work out of economic necessity (Hofferth, 1987) and to have larger family sizes than those who delay their first births, the quantity of maternal time may be an important mechanism through which an early birth affects children.

The quality of parent-child interaction is also critical to a child's healthy development.

Factors such as the mother's level of education and her cognitive attainment have been shown to be linked to different parenting styles (e.g., Baumrind, 1971). Orderliness, cleanliness, and safety of the child's physical environment, regularity and structure in the family's daily routine, intellectual stimulation and emotional warmth are considered critical components of the environments in which children grow up (Bradley and Caldwell, 1984). Researchers have documented that in addition to the mother's own attributes, such as her ethnicity, level of schooling, and IQ, the nature and quality of the home environment that is provided to children is affected by environmental factors as well (Menaghan and Parcel, 1991; Desai et al., 1991). Using the Home Observation for Measurement of the Environment (HOME) scale developed by Bradley (Bradley and Caldwell, 1984), Zill et al. (1991) report lower scores for families falling below the poverty line and who are welfare dependent. Furthermore, Menaghan and Parcel (1991) found that the nature of parent's occupational experiences, and changing family circumstances, such as those brought about by marital disruption or the birth of a new child, may reduce the amount of stimulation and nurturance that parents are able to provide. While research to date has not revealed consistent differences between the parenting behavior of teen and older mothers net of socioeconomic status (Elster et al., 1983; Roosa and Vaughn, 1984; Field et al., 1985), the quality of the child's home environment has been linked to many of the correlates of an early birth.

We also consider the economic resources available in the family. It is well-documented that basic necessities must be met in order to foster children's healthy development -- food, clothing, suitable housing, and a good neighborhood. It is becoming increasingly evident that the experience

of poverty has a substantial impact on the life chances of children, even after taking into account such measures of socioeconomic background as parental education and occupational attainment (McLoyd, 1990; Duncan, 1991). Researchers have uncovered links between living in poverty and coercive patterns of parenting, most likely due to the stress of the parent (Gecas, 1979). Given that women who bear their first children as teenagers are likely to be in poverty at the birth of their children, and for a number of years thereafter (Klerman, 1991; Adams and Williams, 1990; Moore et al., 1992), poverty is a critical mechanism through which the effect of age at first birth is likely to be transmitted to children.

It is also important to consider the role of the father in children's development. Adolescent childbearers are less likely to be married at the time of the birth (Moore, 1992) and to experience marital disruption (McLaughlin et al., 1986; Billy et al., 1986) than are those who delay the birth of their first child. Consequently, it is quite common for children born to teenage mothers to spend some or all of their childhoods living apart from their biological fathers. While the impact of father absence on child development is not entirely clear from available evidence (Hawkins and Eggebeen, 1991; Mott, 1992), what is clear is that the amount of father involvement in never-married families is often sporadic at best (Seltzer and Bianchi, 1988). Prior research on the particular impact of father-involvement among children born to teen mothers has found salutary effects for both the mother and child (Parke et al., 1980; Pederson et al., 1979; Lamb, 1981; Furstenberg, 1976), and there are economic benefits associated with paternal presence in the home (Bianchi and McArthur, 1991). In addition, additional social and financial support are often provided by the father's family when he remains involved with the child (Bolton and Belsky, 1985).

Characteristics of the child also need to be considered in an examination of child well-being. Children cope with stress differently, and there appears to be a particular vulnerability among boys (Zaslow and Hayes, 1986). Furthermore, previous researchers studying the processes by which maternal age at child birth affects children have uncovered inconsistent patterns of results across racial/ethnic groups (see Hofferth, 1987). Therefore, we conduct all of our analyses separately by race/ethnicity.

Finally, there are selectivity factors that differentiate women who have their first births during the teen years from those who postpone childbearing beyond that time. Researchers have observed that teen childbearers differ from their peers even before they become mothers (e.g., Card and Wise, 1978; Hayes, 1987; Geronimus and Korenman, 1991). Teen mothers tend to be less well-educated, to have lower academic ability, lower educational aspirations, and to be from disadvantaged families. These characteristics presumably account in part for differences in child well-being across children born to early and later childbearers; thus, we include selectivity measures such as the mother's AFQT score and family background in our model.

DATA AND METHODS

DATA

We use the National Longitudinal Survey of Youth-Child Supplement (NLSY-CS), a large-scale, longitudinal data set, to explore the processes by which maternal age at first birth influences children's well-being when they reach school-age. The NLSY is a longitudinal survey of American youth who were 14 to 21 when the study began in 1979. Respondents have been followed annually

since then. The sample includes an over-representation of blacks, Hispanics, and economically disadvantaged whites. The study has gathered information on a wide range of topics including: family background; maternal marital, fertility, and employment histories; education and employment of family members; and household composition. In 1986, when the subjects were 21 to 29, the NLSY data collection effort included a substantial battery of assessment information about the children of the roughly 3,000 women who had given birth. The children were reassessed in 1988.

Sample

We limited our sample to first-born children ages 5 to 8 and drew assessment data from the first survey in which the child was age-eligible. We analyze only first-borns in order to control for birth order and to minimize problems associated with including more than one child from the same family. In practice, this means that we include children ages 5 to 8 at the 1986 survey and ages 5 to 6 at the time of the 1988 survey. All variables were constructed to correspond to the timing of the child assessment data used for each child. For some children the assessment year refers to 1986, while for others it refers to 1988.

The sample was further limited to children who were reported as residing with their mothers at the time of the assessment since characteristics of the mother and her life circumstances are being used to predict the well-being of the child.

Limitations

Despite the advantages of the NLSY child data for studying the consequences of early childbearing, it has limitations as well. First, the children in the NLSY are not fully representative of all children in their age group because the NLSY is a random sample of young mothers, not of

children. The children included in the present study represent a cross-section of children born to a sample of women who were between the ages of 21 and 28 on January 1, 1986 and therefore tend to be born to somewhat younger and disadvantaged mothers (especially among the oldest children). In addition, as yet we only have outcome data for a single time point. Finally, although the NLSY Merged Mother-Child data set is richly detailed in many domains, such as child assessments, the ability to measure other factors that may differentiate teen mothers from older mothers, such as level of stress, depression, and self esteem, is limited. Moreover, we lack measures of other important social-psychological inputs into child well-being, such as the level of father involvement in child-rearing and the child's relationship with each parent, as well as physical inputs, such as nutrition and health care.

VARIABLES

Child Outcome Measures

We examine the effects of being born to a young mother on four measures of child well-being: the Behavior Problems Index (BPI); reading recognition and mathematics sub-scales of the Peabody Individual Achievement Test (PIAT), and the Peabody Picture Vocabulary Test-Revised (PPVT-R).

The Behavior Problem Index contained in the NLSY-Child data is a sub-set of items developed by Peterson and Zill (1986), primarily from Achenbach's (1978) Child Behavior Checklist. The BPI is administered to children ages 4 or older and measures mother's reports of the frequency and types of behavior problems. The items selected for inclusion in the NLSY test

battery have a demonstrated ability to distinguish children referred for psychological treatment from typical children.² We employed the total scale score (α reliability = .86) because of its psychometric properties are preferable to any of the available sub-scales (Chase-Lansdale et al. 1991, Baker and Mott, 1989, and Baydar and Brooks-Gunn, 1991). Using the National Health Interview Survey - Child Supplement of 15,000 children, Zill (1988) standardized the BPI separately for boys and girls; these norms were used by the Survey staff to convert raw BPI scores to standard scores. We use these same-sex standard scores in our analyses. Higher scores on the index imply a greater level of behavioral problems.

The reading sub-scale of the PIAT measures word recognition and pronunciation ability; and the mathematics sub-scale of the PIAT assesses ability in mathematics, increasing in difficulty from simple recognition of numerals to advanced concepts such as geometry and trigonometry. Both tests were administered to children ages 5 and over. Because of its demonstrably high test-retest reliability and concurrent validity, the PIAT is widely known and used in research (Baker and Mott, 1989). The Peabody Picture Vocabulary Test (PPVT) is a measure of receptive vocabulary knowledge of orally presented words. The PPVT has strong psychometric properties, is a strong predictor of achievement, and correlates well with established intelligence tests, particularly tests of verbal intelligence (Baker and Mott, 1989; Chase-Lansdale et al, 1991).

Other Endogenous Variables

Means and standard deviations of all variables are included in Appendix Table A-1.

Mother's educational attainment. NLSY respondents were asked to report their highest grade completed in each survey year. We took the value corresponding to the year of the child assessment.

Mother's age at first birth. In the NLSY, information about the respondent's biological first child was collected in 1979 and 1982 through 1988. Each respondent was asked to provide a retrospective account of the timing of their first birth. Since our sample is limited to first-born children of NLSY respondents, none of the cases were missing on the age at first birth measure.

Mother's work experience. The variable for mothers' work experience was derived from mother's reported number of weeks worked in the prior year. We took the average number of weeks worked across the two years prior to the child's assessment as our measure of work experience.

Additional maternal characteristics. Additional maternal measures include the number of children she had borne by the time of the assessment; and her total family income for the prior year, as reported for the year prior to the child assessment year.³

Time spent in poverty. To capture the experience of economic hardship we calculated the percentage of time that the first-born children had spent in poverty from birth to assessment. We developed an indicator for whether family income fell below the poverty threshold for a family of her size for each of the five years using criteria similar to those employed by Center for Human Resource Research (CHRR) staff in developing their poverty indicator. However, when total

family income was missing for a respondent we summed any individual components of family income she reported and evaluated this amount against the poverty threshold for a family of her size. Since the component-derived versions of family income may underestimate true family income, the rate of poverty derived by this measure is somewhat greater than if such cases were set to missing. However, we considered this a preferable strategy over losing all cases with any missing income data. A detailed description of our construction of poverty indicators for each year is provided in Appendix B. In some cases, income data for a given year was unavailable. If the number of years with poverty data was less than the child's age minus two years the variable for proportion of the child's life spent in poverty was set to missing.

Quality of the home environment. We also included the Home Observation Measure of the Environment Short-Form (HOME-SF). The HOME instrument consists of both maternal self-reports and interviewer observations, and was developed to assess quantitative and qualitative aspects of the child-rearing environment. Items are concerned with the level of emotional support and cognitive stimulation the mother provides in the home environment. Different versions of the instrument are administered depending on the age of the child. Bradley (1981) reports inter-rater reliabilities in the high 0.80s to low 0.90s from six studies using the total HOME score. Moreover, previous researchers have shown that the HOME predicts later cognitive, social, and physical development (Baker and Mott, 1989). We use the raw version of the total HOME score. To make this measure conceptually distinct from our father presence measure, we removed the two items related to the child's father.

Father presence. Direct questions related to the presence of the child's biological father were asked of mothers in the NLSY beginning in 1984; however the father's date of departure from the household is not available. To supplement father-presence data for years prior to 1988, Mott (1990) used marital, cohabitational and fertility histories of mothers and the household composition at each interview to construct measures of father presence. Mott provided us with a diskette containing father-presence variables for each survey year. Because the presence of the child's father was determined indirectly, Mott attached a level of uncertainty for each measure. We only used a child's father-presence status for a given year if the level of uncertainty was moderate, and chose to treat as missing data those cases for whom there was substantial uncertainty. To create a measure for the proportion of the child's life spent living with the biological father, we summed the number of years from birth to the assessment in which the child lived with his or her biological father. To compute a proportion, this sum was divided by the child's age. The variable PCTDAD was created only for children for whom at least 85 percent of their lives were accounted for by the available data. Cases with less coverage were set to missing.

Child characteristics. We include the child's sex and run analyses separately by race/ethnicity.

Exogenous variables.

The longitudinal nature of the NLSY allowed us to go back to the 1979 interview of the mother to retrieve retrospective information about the mother and her family of origin to control for a wide range of factors that affect selectivity into early childbearing. We used measures of the educational attainment of her better educated parent, an index of the presence of reading materials

in her home when she was 14, her number of siblings, whether her own mother was employed when she was 14, whether she resided in a rural community at age 14, and whether she was living with both biological parents at that age.

We also used data collected in surveys prior to the child assessment to ascertain the mother's age of menarche, whether she used hashish or marijuana before the age of 15, and whether she had a pregnancy (terminated through miscarriage, stillbirth, or abortion) prior to the birth of her first child.

To control for the mother's own cognitive achievement, we included her score on the Armed Forces Qualifying Test (AFQT) in 1979, derived from the Armed Services Vocational Aptitude Battery (ASVAB). From items included in the 1979 survey we constructed a six-item scale of traditional family attitudes based on level of agreement with such statements as "a woman's place is in the home," "a wife with a family has no time for other employment," and "women are happier if they stay at home and take care of children." The higher the value, the more "traditional" the woman's attitudes. Finally, we included a measure of the respondent's ideal number of children for a family, which she reported in 1979.

To augment the individual-level information available for mothers in the NLSY we appended state-level indices assumed to influence fertility behavior to the mother's data file -- the average monthly AFDC payment in the respondent's 1979 state of residence, and a state-level measure of unmet need for family planning services.

Since missing data tend to occur disproportionately among the economically disadvantaged, and since children in this group are presumably at greatest risk of difficulty, we were reluctant to

drop children whose mothers had missing data on exogenous variables. We imputed the mean (derived separately by race/ethnicity and sex) for children whose mothers had missing values on exogenous variables. To evaluate the extent to which imputation influences our results we constructed an indicator variable to flag cases whose missing values on exogenous variables were imputed with mean values. This missing data indicator (MIND) was included in each of our substantive equations. In addition, we imputed mean values for one endogenous variable, the HOME scale, because substantial proportions of respondents had at least some missing data on this item. We considered using the mean value by race and sex to be a preferable strategy over losing all cases that were missing on a component of this measure.

METHODS

Our model is estimated using two-stage least squares. Identification of equations is a precondition for two-stage least squares to give consistent, unbiased parameter estimates (Hanushek and Jackson, 1977); but a common problem facing researchers is the shortage of instruments to predict each element of the model. Since many of the processes in our model are strongly related to family background, it is difficult in practice to identify variables that predict one without also predicting another. To overcome this difficulty, we employed a number of strategies. For example, to identify our age at first birth equation we follow the lead of Rindfuss, St. John and Bumpass (1984) and Marini (1984) and include a measure of whether or not the woman had a miscarriage, still-birth or abortion prior to her first birth.⁴ In addition, we also include measures of the mother's age at menarche, and several contextual variables. To estimate our equation for highest grade

completed, we use a strategy suggested by David Ribar (1991), drawn from work by Angrist and Krueger (1990) -- including a measure of whether the woman was born in the first quarter of the calendar year. Being born in the first quarter of the year is expected to have a small negative effect on high school completion, but to have no direct effect on fertility. Table 1 summarizes the exact specification of each of our models.

RESULTS

Bivariate Results

The key questions guiding our analyses are whether there are effects of mothers' age at first birth on various measures of child well-being for elementary school-aged children, and, if there are effects, how they are they transmitted. From the mean PIAT, PPVT, and BPI scores presented in Table 2 we see that children of teen mothers generally perform somewhat less favorably than those whose mothers were older at their births. Differences between early and relatively later childbearers⁵ are the most pronounced among whites, less consistent among blacks, and trivial among Hispanics in this bivariate comparison. Comparisons between younger and somewhat older mothers are undermined by the relatively small number of first-time mothers in their mid-twenties among blacks and Hispanics. In fact, among blacks and Hispanics, the number of first-borns born to mothers aged 24 and older is too small to tabulate separately.

Notable differences in PIAT scores across mother's age at first birth categories are observed for both the reading and mathematics tests among white children, while for blacks, differences are detectable for the reading test alone. Children born to teen mothers also perform less well on the

PPVT. For white children, there is a three- to seven-point difference in PPVT scores among children born to 16 to 17 year olds and those whose mothers fall into the two oldest categories of childbearers (ages 22 or more), though the children of the older mothers score somewhat lower than children born to slightly younger mothers.

On the Behavior Problems Index, there is a somewhat greater tendency for the children of white teen mothers to score higher on this mother-rated index than those whose mothers were older at their births; this pattern is less obvious among black and Hispanic children. To examine what accounts for these mean differences we turn to the results from our structural equation model.

Structural Equation Model Results

Direct Effects

As discussed previously, we assume that the processes by which child outcomes are attained are multiple and complex. In particular, we consider the influence of eight endogenous variables related to the mother's characteristics and experiences and the child's developmental environment. Appendix Tables A-2 to A-5 present two-stage least squares estimates for each of our four measures of child well-being calculated for the full sample, as well as separately by race. A summary of the relationships observed across all of the measures is provided in Table 3. Identifying the factors that influence each of our endogenous variables sets the stage for understanding the multi-faceted process through which a mother's age at her child's birth affects the child's later well-being.

Age at First Birth. The mother's level of educational attainment has a predictably positive effect on age at first birth for all three racial/ethnic groups, as does age at menarche. That is, the

more years of schooling she completed and the older she was at first menstruation, the older the mother's age at first birth. We also find that living in a rural community at age 14 hastens the timing of a white women's first birth, while it delays entry into motherhood among blacks and Hispanics. Being in an intact family at age 14 is positively related to age at first birth among whites and Hispanics, while a statistically significant positive effect of number of siblings is detectable only for blacks. Finally, while the poverty rate of the mother's state of residence predicts age at first birth among both whites and Hispanics, (albeit in opposite directions), our other contextual variables -- average state AFDC payments and the level of unmet need for family planning services - - are only statistically significant for Hispanics.

These data provide evidence that part of the bivariate association between an early birth and poor child outcomes can be explained by some factors that pre-date the birth, such as the characteristics of the young woman's family of origin, as well as by the mother's subsequent attainments, such as her educational attainment.

Mothers' Educational Attainment. The causal relationship between age at first birth and the mother's education is found to be simultaneous. That is, in addition to the effect of education on age at first birth, the timing of the mother's first birth predicts her level of schooling for all three racial/ethnic groups. Moreover, the completed years of schooling of her parents and the number and types of reading materials in her home during her youth are also positively related to the amount of education the mother completes. Rural residence at age 14 is associated with more years of schooling among whites and less schooling among Hispanics. Net of these effects (and net of the effect of family background on age at first birth), being from an intact family has a negative effect

on the highest grade completed among blacks. Our instrumental variable for a first quarter birth is statistically significant for Hispanics only.

Number of Children. As age at entry into motherhood is delayed for whites, blacks, and Hispanics, the number of children is significantly reduced. Completed years of schooling also lowers the family size of blacks, while a woman's reported ideal number of children has a statistically significant positive effect on the number of children for whites.

Time With Biological Father. Among blacks, whites, and Hispanics, the later the first birth and the more traditional the mother's attitudes about a woman's role, the larger the share of the child's life that is spent residing with their fathers. Educational attainment is also positively related to the proportion of time spent with the biological father for whites and blacks. For whites, an additional significant effect is observed. The mother's intact family status at age 14 is significantly related to the time white children spend living with their biological fathers. Finally, the effect of the child's sex works in the opposite direction for Hispanics and blacks. Being a boy increases Hispanic children's proportion of time spent with their biological father, while it diminishes it for blacks.

Mother's Work Experience. Factors that are significantly related to a woman's average work experience vary across the three racial/ethnic groups. A woman's level of schooling is related to greater number of weeks worked for whites, while having had a mother who worked and having a higher AFQT score are positively related to work experience for blacks and Hispanics. The number of children in the family has a statistically significant negative effect on average weeks worked for whites and blacks.

Family Income. The mother's highest grade completed is positively associated with family income among blacks and Hispanics, and the proportion of time the children spent living with their biological father has a statistically significant positive effect on family income for whites and Hispanics. A woman's level of work experience in the previous two years is also positively related to family income for blacks and Hispanics.

Poverty. The mother's level of educational attainment reduces the experience of poverty for all three racial/ethnic groups, as does living with the child's biological father. The mother's age at first birth is also significantly associated with the proportion of their lives that children have spent in poverty from birth to the assessment date for whites and blacks. For blacks, the effect of age at birth works in the expected direction. Each year of delay in entry into motherhood corresponds to a three percent decrease in proportion of time spent in poverty among blacks. For whites, the effect of age at first birth is counter to expectations -- exerting a statistically significant *positive* effect. An explanation for this may be that the youngest of the childbearers resided in their parents' homes during the early part of their children's lives, in effect sheltering them from the risk of poverty during that period. Given the lower incomes of black families, black teen mothers who also lived with their own mothers were probably less likely to have been protected from poverty. Mothers who were somewhat older at the birth of their first child may have been more inclined to establish their own households, but due to their relative youth or lack of a marriage partner they may have been vulnerable to poverty.

The Home Environment. Age at first birth is positively related to the child's HOME score for whites and Hispanics, and negatively associated with the HOME score for blacks. Because each

of the endogenous variables in our model is predicted by complex relationships among other endogenous variables, this negative association may obscure other processes at work that account for the observed relationship. Educational attainment has the predicted positive effect on the HOME score for whites and Hispanics. Among blacks, the additional factors associated with the HOME score are the number of children and work experience, both of which have negative effects; and family income, which positively affects the HOME score.

Child Outcomes. In general, we found that the factors hypothesized to directly affect child outcomes worked fairly well for whites, less so for blacks, and poorly for Hispanics. Because the factors shown to significantly affect child outcomes differ by race and ethnicity, we discuss them separately.

Whites. We hypothesized no direct relationship between age at first birth and our measures of cognitive competence and social-psychological functioning, but that its effect would work through the mother's educational attainment and AFQT score, father-presence, the proportion of time the child spent in poverty, and the nature and quality of the home environment. We also expected that the child's sex would have a direct effect on their cognitive achievement and BPI scores. Among white children, each of these factors, with the exception of the child's sex, exerts a statistically significant influence on at least one of the outcomes; however, there is notable variability across outcomes in the variables that emerge as important. More specifically, we find that the HOME score and the mother's AFQT score are positively associated with the reading score, while the proportion of time that the child has spent in poverty is negatively related to reading achievement and the child's PPVT score.

Net of these factors, there are two factors with unexpectedly negative effects. There is a *negative* association between the mother's level of educational attainment and the child's reading test performance, and the proportion of time spent with the biological father *lowers* the PPVT score among whites. Educational attainment does have the predicted relationship with the behavior problems among white children. The mother's AFQT score has a statistically significant positive effect on white children's PPVT scores, as found elsewhere (Moore and Snyder, 1991), and is the only statistically significant predictor of mathematics scores among white children.

Blacks. Among black children, the proximate factors we considered do not account well for children's cognitive and behavior problems scores. In only two models (mathematics performance and PPVT score) did factors related to the mother's current life circumstances emerge as important. The higher the mother's level of educational attainment, the higher the child's mathematics score, and the higher the quality of black children's home environments, the better their performance on the PPVT. The mother's AFQT score and the child's sex also significantly predict to the child's outcomes. The mother's AFQT score is positively related to reading achievement and PPVT scores, and boys perform less favorably on the reading, mathematics, and BPI assessments than do girls.

Hispanics. The factors hypothesized to directly affect child outcomes predict rather poorly for Hispanics. We find that the amount of time the child has spent with his/her biological father has a statistically significant effect on children's reading and mathematics performance, but in an unexpected direction. More specifically, the greater the proportion of time spent with the biological father, the less favorable the child's reading and mathematics scores. In addition, the presence of

missing data has a positive effect on reading achievement -- a result which is the reverse of what we would have expected.

Total and Indirect Effects of Age at First Birth

We take account of the weakness of these results by dropping non-significant endogenous paths in the calculation of total and indirect effects. Appendix Tables A-6 through A-9 provide two-stage least squares estimates for the reduced models. Table 4 presents the effects of being one year older at first birth on our four child outcome measures. There is little evidence in this constrained sample that early childbearing compared to somewhat delayed childbearing is generally negative for first-borns. Nevertheless, some advantages of delayed motherhood are observable among whites for three of the four outcomes we examined.

Among white children, the total effect of a single year's delay in the age at first birth ranges from an improvement of one-quarter of a point on the PPVT (.26) to a reduction of about 3 points on the mother-rated behavior problems index. Given that the standardized BPI score has a standard deviation of 13, this means that a delay of four years would at least theoretically result in a one standard deviation improvement in mother-rated behavior problems. The estimated total effect of age at first birth on the mathematics scores of white children is zero.

For black children, the effect of delaying entry into motherhood by a single year is advantageous for two of the four outcomes we examined. In both cases, the child's PIAT mathematics score and PPVT score are raised by nearly two points with each single year delay of motherhood. Postponing a first birth has no discernable effect for Hispanic children across any of the measures. To understand what accounts for the results observed among African American and

white children, we must examine the variables through which age at first birth exerts an indirect influence.

Indirect Effects of Mother's Age at First Birth

Among the explanatory processes examined in our model, the mother's level of educational attainment, the proportion of time the child has spent in poverty, the proportion of time spent with the biological father, and the child's home environment are the mechanisms through which mother's age at first birth affects child well-being; however, the results vary somewhat by race and outcome being considered.

A key process by which age at first birth exerts a notable indirect influence on the child outcomes we examined is via the mother's level of educational attainment. By operating through mother's educational attainment, the indirect effect of age at first birth for white and black children is to improve their cognitive scores from about one-tenth to nearly 2 points for each year of delay. Because the direct effect of postponing childbirth by a single year was to raise the level of schooling by about one-half year, this result is not surprising. Among whites, the indirect effect of the timing of the first birth via educational attainment is also advantageous for BPI scores -- lowering the mother-related behavior problems score by almost three points.

The proportion of their lives that children spend in poverty is another critical mechanism by which the effect of an early birth is transmitted among whites. This indirect effect of postponing childbearing for one year generally amounts to a 2.15 point improvement in children's reading achievement and a 1.37 point improvement in their PPVT scores.

The nature and quality of the child's home environment is another means by which the timing of the first birth affects both white and African American children. For example, a delay of a single year in the timing of motherhood among whites corresponds to a three point improvement (i.e., nearly 1/3 of a standard deviation) in the child's reading score via its indirect effect through the HOME score. The same one-year delay of entry into motherhood raises black children's PPVT scores by 2.29 points via the HOME score.

The indirect effects of age at first birth through the number of children in the household and family income also deserve attention among blacks. The indirect effect of the timing of first birth through family size and financial status is beneficial for black children -- raising their PPVT scores 1.2 and 1.6 points, respectively.

The indirect effect of age at first birth through the proportion of time spent with the biological father is important for half of the outcomes we considered for whites. Interestingly, while the indirect effect of mother's age at first birth through father-presence is favorable for reading achievement, the comparable effect is unfavorable for PPVT scores among white children. More specifically, the indirect effect of age at first birth through proportion of time spent with father on reading achievement is 1.42 for whites and -.14 for the child's receptive vocabulary score. We are not able to explain why father-presence has this variable effect for white children. Similarly, others using these same data have not found father presence to be important (Hawkins and Eggebeen, 1991; Mott, 1992). Furstenberg and colleagues (1987) also documented a general absence of effects of paternal participation on children's well-being using data from the National Survey of Children. A possible explanation for these inconsistent findings is that we are not capturing the quality of the

relationship between the children and their fathers by relying on a measure of his presence alone. For example, paternal involvement has been argued to consist of engagement, accessibility, and responsibility, i.e., day-to-day care (Lamb, 1987; Pleck et al., 1986).⁶ Given the high rate of marital dissolution among teen mothers, it may also be that children born to teen mothers who marry are exposed to greater conflict and marital disharmony as they are growing up.

SUMMARY AND CONCLUSIONS

We began our analysis with two questions: 1) are there effects of mother's age at the time of the child's birth on the cognitive achievement and behavior problems of elementary school-aged children?; and 2) if there are effects, by what mechanisms are they transmitted to children? Using a structural equation model approach to examine the processes by which we hypothesized that age at first birth, other maternal characteristics, and the child's developmental environment shape children's outcomes, we find some hints that being born to a relatively older mother is to the child's advantage, especially among white children. However, we found no discernable effect of an early birth on two out of four of our outcomes for blacks, nor on any of the measures of child well-being we considered for Hispanics. It is important to underscore that our conceptual model worked reasonably well in linking mother's age at first birth to the life circumstances of mothers and their children, but performed less well in predicting to our four measures of child well-being, especially among blacks and Hispanics.

There are multiple reasons why we were unable to detect a consistently negative effect of being born to a teen mother among the children in this sample. The first possibility is that there is

no deleterious effect for children of being born to a teenage mother on their cognitive competence and social-psychological functioning, and thus our results mirror social processes. The second possibility is that we are constrained by the youthfulness of the mothers in our sample, since we are only able to examine the outcomes of children born to mothers ranging from teens to age 26. In other words, we may not be able to detect differences in children born to teenage mothers because we are only comparing them to children born to slightly older mothers, rather than to children whose mothers delayed childbearing into their later twenties and early thirties. Other researchers have provided evidence of the salutary effects of being born to older parents (Baldwin and Nord, 1984; Hofferth, 1987; Mare and Tzeng, 1989).

The children in our sample are also relatively young, ranging in age from five to eight years old. It may be that more time is needed for the full implications of being born to a teenage mother to unfold. Another reason for our findings may be that we limited our analysis to first-borns only. Later birth-order children may be more seriously affected by the economic and resource constraints posed by large family sizes. Also, teen mothers may receive greater social and economic support from extended family members and others with their first as compared with later births.

Finally, a key explanation may be that the data we used are not rich in measures from the perspective of the child. For example, we are not able to account for differences in parenting practices, affective warmth, nor the child's relationship with the parents.

Moreover, while our results provide evidence of the critical contribution of such factors as the child's home environment and the experience of poverty, it is important to recognize that these data do not provide insight into what it is about these experiences that affects children. With

respect to poverty, for example, because no measures of the mother's level of stress and emotional well-being were available to us, we are unable to say what the mediating processes may be. Further research is needed using data containing richer measures of such factors.

Endnotes

1. The effect of being born to a teen parent appears to be stronger for blacks and for boys than it is for whites and for girls, and to increase with the age of the child (Hofferth, 1987).
2. The thirty-two items contained in the 1986 version of the Behavior Problems Index are as follows: child has sudden changes in mood or feelings; complains that no one loves him/her; is rather high strung, tense and nervous; cheats or tells lies; is too fearful or anxious; argues too much; has difficulty concentrating, cannot pay attention for long; is easily confused, seems to be in a fog; bullies or is cruel or mean to others; is disobedient at home; does not seem to feel sorry after he/she misbehaves; has trouble getting along with other children; is impulsive, or acts without thinking; feels worthless or inferior; is not liked by other children; has a lot of difficulty getting his/her mind off certain thoughts (has obsessions); is restless or overly active, cannot sit still; is stubborn, sullen, or irritable; has a very strong temper and loses it easily; is unhappy, sad, or depressed; is withdrawn, does not get involved with others; breaks things on purpose, or deliberately destroys his/her own or another's things; clings to adults; cries too much; demands a lot of attention; is too dependent on others; is disobedient at school; has trouble getting along with teachers; feels others are out to get him/her; hangs around with kids who get into trouble; is secretive, keeps to himself/herself; worries too much.
3. All items reported in dollars were converted to 1989 constant dollars using an inflation factor provided by the Bureau of Labor Statistics.
4. A measure of prior pregnancy excluding abortions was also used, but results were unaffected.
5. Because of the relative youthfulness of women in our sample we are not able to observe the full age-range of mothers. The oldest age at first birth in our sample is 26. Consequently, children of delayed childbearers are not included. It is important to be mindful, therefore, that ours is a comparison of teen mothers with slightly older mothers.
6. The NLSY HOME measure contains three items related to the child's father for school-aged children: a) whether the child sees their biological father, b) whether the child eats dinner with both their mother and father, and c) whether the father does outdoor activities with the child. It is our intention to explore in a future version of this paper the extent to which these items explain the results we have observed for father presence.

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Figure 1.
Model of the Processes Mediating the Relationship Between
Mother's Age at First Birth and Child Achievement and BPI Scores

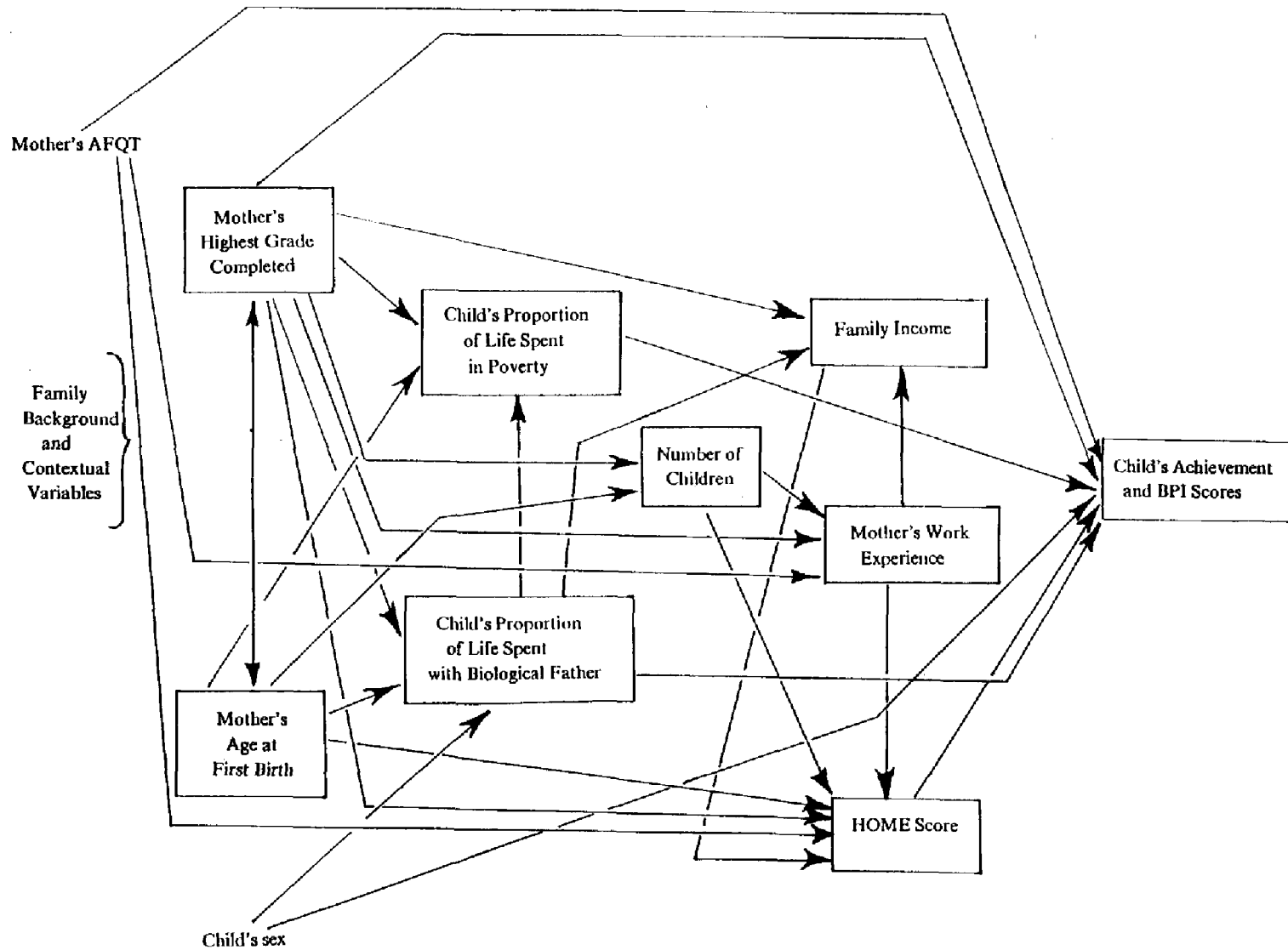


Table 1. Specification of Structural Equation Model

	Endogenous Variables								
	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	CHILD OUTCOMES: PIAT reading and math, PPVT, BPI
Age at first birth (AFB)	--	X	X	X			X	X	
Highest grade completed (HGC)	X		X	X	X	X	X	X	X
Number of children (# KIDS)					X			X	
Percent time spent with biological father (%DAD)						X	X		X
Work experience (WRK EXP)						X		X	
Family income (INC)								X	
Percent time spent in poverty (%POOR)									X
HOME score (HOME)									X
Mother's rural residence at age 14	X	X							
Mother's number of siblings	X	X	X						
Grandparents' education		X							
Reading materials at age 14		X							
Mother lived in intact family at 14	X	X		X					
Grandmother employed when mother was age 14					X				
Mother's AFQT score					X			X	X
Mother had first quarter birth		X							
Mother's ideal number of children	X		X						
Mother's traditional family attitudes				X					
Mother's age at menarche	X								
Mother used marijuana/hashish before 15	X	X							
Mother had prior pregnancy	X								
State poverty rate (by age)	X								
Average AFDC payment for state	X								
Unmet need for family planning for state	X								
Child's sex				X					X
Missing data indicator	X	X	X	X	X	X	X	X	X

Note: X denotes inclusion in model. Models estimated separately by race/ethnicity.

Table 2. Mean Scores on Peabody Individual Achievement Tests (PIAT) in Reading and Mathematics, and Peabody Picture Vocabulary Test (PPVT), and Behavior Problems Index (BPI), by Mother's Age at First Birth and Race for First Born Children Ages 5 to 8.

Child Outcomes

<u>Mother's age at first birth</u>	<u>Unweighted N</u>	<u>PIAT Reading Recognition</u>	<u>PIAT Mathematics</u>	<u>PPVT</u>	<u>BPI</u>
White					
Less than 16	17 ¹	--	--	--	--
16-17	104	104.9	99.7	96.7	109.7
18-19	243	107.1	102.2	99.0	108.3
20-21	216	107.3	103.1	100.4	106.8
22-23	123	109.2	103.3	104.3	106.6
24+	66	110.9	103.8	100.0	102.7
Black					
Less than 16	26	99.0	95.1	77.8	109.7
16-17	113	104.5	94.3	81.1	107.6
18-19	177	104.2	94.9	81.6	107.9
20-21	121	105.8	97.0	85.0	108.6
22-23	39 ¹	108.7	95.1	82.2	108.3
24+	14 ¹	--	--	--	--
Hispanic					
Less than 16	4 ¹	--	--	--	--
16-17	60	101.5	97.7	84.7	109.6
18-19	108	99.3	94.7	83.7	104.9
20-21	80	102.4	96.1	79.8	106.5
22-23	36 ¹	102.9	97.5	82.7	110.2
24+	19 ¹	--	--	--	--

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth Child Supplement (NLSY-CS), 1986 and 1988 data and merged mother data from the National Longitudinal Survey of Youth, 1979-88 data.

Note: 1. Insufficient cell sizes to present reliable results.
2. Table values (except N's) are based on weighted data.

Table 3. Summary of Two-Stage Least Squares Estimates of Parameters in Structural Equation Models, by Race/Ethnicity

	ENDOGENOUS VARIABLES								CHILD OUTCOMES			
	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	READ	MATH	PPVT	BPI
Constant	+++ WBH + T	--- ---	+++ WBH + T	-- WB - T	---	-- BH - T	+++ WBH + T	+ B + T	+++ WBH + T	+++ WBH + T	+++ WBH + T	+++ WBH + T
Age at first birth (AFB)		+++ WBH + T	--- WBH - T	+++ WBH + T			+ - WB + T	+ - + WBH - -				
Highest grade completed (HGC)	+++ WBH + T		- B - -	++ WB + T	+ W + T	++ BH + T	--- WBH - T	+ + WH + T	- W - T	+ B - -	---	- W - -
Number of children (# KIDS)					-- WB - T			- B - T				
Percent time spent with biological father (% DAD)						+ + WH + T	--- WBH - T		- H - -	- H - T	- W - T	---
Work Experience (WRK EXP)						++ WB + T		- B - T				
Family Income (INC)								+ B + T				

Table 3. (cont.)

	ENDOGENOUS VARIABLES								CHILD OUTCOMES			
	AFB	HGC	KIDS	DAD	WORK EXP	INC	POOR	HOME	READ	MATH	PPVT	BPI
Percent time spent in poverty (% POOR)									- W _ _ _	_ _ _ _ _	- W _ _ _ T _	_ _ _ _ _
HOME score (HOME)									+ W _ _ + T	_ _ _ _ _	+ B _ _ _	_ _ _ _ _
Mother's rural residence at 14	- + W B _ _	+ - W _ H _										
Mother's number of siblings	- + W B _ + T	_ _ H _ T	+ _ B _ + T									
Grandparent's education		+ + + W B H + T										
Reading materials at 14		+ + + W B H + T										
Mother lived in intact family at 14	+ + W B _ + T	- _ B _ _		+ W _ _ + T								

Table 3. (cont.)

	ENDOGENOUS VARIABLES								CHILD OUTCOMES			
	AFB	HGC	KIDS	DAD	WORK EXP	INC	Z POOR	HOME	READ	MATH	PPVT	BPI
Grandmother employed when mother 14					+ + - B H + T							
Mother's AFQT score					+ + - B H + T			--- -	+ + W B - + T	+ W - - + T	+ + W B - + T	--- -
Mother's ideal number of children	--- -		+ W - - + T									
Traditional family attitudes				+ + + W B H + T								
Age at menarche	+ + + W - H + T											
Marijuana/ hashish before 15	- - W - H - T	+ - B - + T										
Prior pregnancy	+ + + W B H + T											

Table 3. (cont.)

	ENDOGENOUS VARIABLES								CHILD OUTCOMES			
	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	READ	MATH	PPVT	BPI
Poverty rate	- + W _ H											
Average AFDC payment	+ - _ H + T											
Unmet need for family planning	+ - _ H + T											
Child's Sex				- + _ B H					- _ B _ - T	- _ B _ - T	-	+ _ B _
First Quarter Birth		- - _ H - T										
Missing data indicator	- _ _ H	- _ B _	-	-	- _ B _	-	+ _ H	-	+ _ H	-	-	-

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data.

Key: Table summarizes patterns across the four models for each race/ethnicity group and total sample. Statistically significant coefficients are designated as follows: W = White, B = Black, H = Hispanic, T=Total; + and - used to designate direction associated with coefficients.

Table 4. Effects of Being One Year Older at First Birth on Measures of Child Well-Being Among First Borns at Ages 5-8 by Race/Ethnicity

Child Outcome Measure	Total Effect	Indirect Effect Through:							Direct Effect
		Highest Grade Completed	Number of Children	Proportion of Time Spent with Biological Father	Mother's Work Experience	Proportion of Time Spent in Poverty	Family Income	HOME Score	
PIAT Reading									
White (mean = 107, s.d. = 12)	1.24	0.09	0	1.42	0	2.15	0	3.25	0
Black (mean = 105, s.d. = 12)	0	0	0	0	0	0	0	0	0
Hispanic (mean = 101, s.d. = 13)	0	0	0	0	0	0	0	0	0
Total	1.76	1.76	0	0	0	0	0	1.76	0
PIAT Mathematics									
White (mean = 102, s.d. = 12)	0	0	0	0	0	0	0	0	0
Black (mean = 95, s.d. = 12)	2.31	2.31	0	0	0	0	0	0	0
Hispanic (mean = 97, s.d. = 12)	0	0	0	0	0	0	0	0	0
Total	-0.67	-0.42	0	-0.67	0	0	0	0	0
PPVT-R									
White (mean = 99, s.d. = 12)	0.26	0.76	0	-0.14	0	1.37	0	0	0
Black (mean = 82, s.d. = 13)	2.29	1.52	1.20	0	-0.05	0	1.61	2.29	0
Hispanic (mean = 83, s.d. = 16)	0	0	0	0	0	0	0	0	0
Total	0.62	1.25	0	-0.60	0	2.07	0	0	0
Behavior Problems Index (Higher value = greater number of problems)									
White (mean = 107, s.d. = 14)	-2.98	-2.98	0	0	0	0	0	0	0
Black (mean = 108, s.d. = 13)	0	0	0	0	0	0	0	0	0
Hispanic (mean = 108, s.d. = 14)	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Note: The indirect effects do not sum to the total indirect effects because the indirect effects of prior variables operate through the indirect effect on later variables.

APPENDIX A

**VARIABLES USED IN
STRUCTURAL EQUATION MODELS
AND TWO-STAGE LEAST
SQUARES ESTIMATES
OF PARAMETERS**

Appendix Table A-1. Description of Variables Used in Structural Equation Models Linking Mother's Age at First Birth to Outcomes for Children

Variable	Description	Means (Standard Deviations)		
		White	Black	Hispanic
RRECSCH	PIAT Reading Recognition - standardized score - Taken from raw variables for 1986 (D0580400) and 1988 (D0799900). Range: 65 to 135.	N = 645 107.12 (12.2)	N = 421 104.87 (12.3)	N = 234 101.15 (12.6)
MATHSCH	PIAT Mathematics - standardized score - Taken from raw variables for 1986 (D0580100) and 1988 (D0799600). Range: 65 to 135.	N = 655 101.89 (12.1)	N = 421 95.39 (12.3)	N = 239 96.49 (12.4)
PPVTCH	Peabody Picture Vocabulary Test - Revised (PPVT-R) (standardized scores) - Taken from raw variables for 1986 (D0581000) and 1988 (D0800500). Since cases that scored below 40 on the raw scores were not assigned a standardized score by Center for Human Resource Research (CHRR) staff, we used supplementary norms tables to assign them a standardized score. Range: 19 to 147.	N = 678 98.96 (11.7)	N = 437 82.38 (13.4)	N = 260 82.68 (16.1)
BPISSCH	Behavior Problems Index - same sex standardized score - Taken from raw variables for 1986 (D0576100) and 1988 (D0796500). Range: 71 to 145.	N = 644 107.36 (13.7)	N = 410 108.27 (13.3)	N = 238 107.63 (14.0)
SEX	Sex of child (D00054). Values: 1 = male, 0 = female.	0.51 (0.5)	0.51 (0.5)	0.50 (0.5)
AGEBR01	Mother's age at first birth in years. Determined from variables for month and year at respondent's first birth. Range: 14 to 26.	19.90 (2.3)	18.76 (2.2)	19.45 (2.3)
HGCCH	Mother's highest grade completed (in years) at assessment. Range: 0 to 20.	11.81 (1.8)	12.12 (1.6)	11.04 (2.5)
NKIDSCH	Number of mother's children at assessment. Range: 1 to 6.	1.99 (0.8)	1.95 (0.9)	2.14 (0.9)
PCTDAD	Proportion of years from child's birth to assessment that biological father has resided with the child. Created from father-presence variables constructed by Mott (1990). Range: 0 to 1.00.	0.75 (0.4)	0.26 (0.4)	0.68 (0.4)
PRWKEXP	Mother's prior work experience calculated as average number of weeks worked per year in the previous two years. Range: 0 to 52.	24.30 (20.4)	21.29 (20.5)	20.68 (20.5)
AFAMINCH	Family income from 1986 or 1988 adjusted for inflation and the presence of missing data. Range: 0 to 120,848.	23,069 (16,547)	15,430 (14,11)	19,224 (14,790)

Appendix Table A-1. (continued)

Variable	Description	Means (Standard Deviations)		
		White	Black	Hispanic
HMTNDCH	HOME raw score with 2 variables involving father removed. Range: 2 to 24.	16.69 (2.7)	14.99 (3.0)	15.13 (3.1)
ZRURAL14	Dummy variable for mother's rural residence at age 14. Values: 1 = yes, 0 = no.	0.26 (0.4)	0.20 (0.4)	0.12 (0.3)
MOMSIBS	Mother's number of siblings reported in 1979 interview. Range: 0 to 17.	3.79 (2.4)	5.09 (3.1)	4.96 (3.0)
ZPAREDUC	Education level (in years) of mother's highest educated parent. Range: 0 to 20.	11.50 (2.6)	10.90 (2.5)	8.40 (3.7)
READ14	Index of reading materials in mother's home when she was 14. Based on the sum of mother's positive responses to the questions: "At age 14 did any household member: 1) have a library card?; 2) receive magazines regularly; 3) receive newspapers regularly?" Higher values correspond to greater availability of reading materials. Range: 0 to 3.	2.06 (0.9)	1.53 (1.03)	1.41 (1.0)
TWOBIO14	Dummy variable for mother lived with both biological parents at 14. Values: 1 = yes, 0 = no.	0.67 (0.5)	0.45 (0.5)	0.60 (0.5)
GRMEMP14	Dummy variable for grandmother was employed when mother was 14. Values: 1 = yes, 0 = no.	0.48 (0.5)	0.56 (0.5)	0.42 (0.5)
AFQT	Mother's Armed Forces Qualifying Test (AFQT) score. Range: 30 to 1035.	683.17 (188.3)	486.31 (166.0)	513.88 (191.5)
IFAMSZ	Mother's ideal number of children reported in 1979 interview. Range: 0 to 15.	2.73 (1.2)	3.26 (1.6)	3.14 (1.3)
FAMATT79	Mother's average response to 6 questions on the appropriate roles of women reported in 1979. Values range from 1 = least traditional to 4 = most traditional.	2.14 (0.5)	2.08 (0.5)	2.22 (0.5)
FRSTQB	Dummy variable for mother was born in the first quarter of the year. Values: 1 = yes, 0 = no.	0.24 (0.4)	0.29 (0.5)	0.23 (0.4)
ZAGEMENS	Mother's age at menarche. Range: 9 to 18.	12.35 (1.6)	12.37 (1.8)	12.03 (1.6)
DRUG15	Dummy variable for mother used marijuana/hashish before age 15. Values: 1 = yes, 0 = no.	0.16 (0.4)	0.06 (0.2)	0.12 (0.3)
PRPREG	Dummy variable for mother had a pregnancy terminated by miscarriage, still birth or abortion prior to her first birth. Values: 1 = yes, 0 = no.	0.16 (0.4)	0.15 (0.4)	0.14 (0.4)
POV	Proportion of families in poverty (by race) for respondent's state in 1979. Source: 1980 Census of Population, Ch.D., Detailed Population Characteristics, Parts 1-52. Table 248. Range: 0.04 to 0.39.	0.07 (0.02)	0.27 (0.05)	0.15 (0.02)

Appendix Table A-1. (continued)

Variable	Description	Means (Standard Deviations)		
		White	Black	Hispanic
AVGEAFDC	Average monthly AFDC payment (in dollars) per family for respondent's state in 1979. Source: <i>Committee on Ways and Means, 1982. "Background Material and Data on Major Programs within the Jurisdiction of the Committee on Ways and Means, 1982."</i> U.S. House of Representatives. Table 7. pp.129-130. Range: 88 to 431.	268.81 (98.8)	215.18 (104.2)	289.49 (130.1)
ZUNMET	Percent of unmet need for family planning services in respondent's state of residence in 1979. Source: Torres, A., Darroch, Forrest J., and Eisman, S. (1981). "Family Planning Services in the United States, 1978-79." <i>Family Planning Perspectives</i> , 13(3), May/June, pp.132-140. Range: 5 to 59.	44.53 (10.2)	46.32 (7.9)	39.77 (9.6)
MIND	Dummy variable to indicate that missing data on at least one exogenous variable was imputed using the mean for the respondent's race/ethnic group and sex. Values: 1 = yes, 0 = no.	0.17 (0.4)	0.17 (0.4)	0.18 (0.4)

Appendix Table A-2. Two-stage Least Squares Estimates of Parameters in Structural Equation Model: PLAT Reading Recognition Performance, by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PLAT READ
Constant	W:	10.73	1.14	2.60***	-0.67***	-2.75	-6912	1.60***	4.08*	108.99***
	B:	9.65***	1.00	6.62***	-1.26***	30.28	-28,065	2.76***	22.32**	94.18***
	H:	7.19***	1.03	4.75***	-0.22	9.73	-21,516***	1.33***	-0.98	103.07***
	T:	10.22***	-0.65	4.37***	-0.52***	-3.70	-18,122***	1.76***	6.98**	68.37***
Age at first birth (AFB)		--	0.44***	-0.06**	0.05***			0.03**	0.32**	
			0.52***	-0.20***	0.03			-0.04**	-0.43*	
			0.47***	-0.12**	0.03			0.02	0.22	
			0.55***	-0.13***	0.03***			0.02**	0.05	
Highest grade completed (HGC)		0.76***	--	0.03	0.03**	3.59**	439	-0.12***	0.91**	-5.85**
		0.71***		-0.08	0.07***	-0.08	2936***	-0.11***	0.31	0.88
		0.34***		-0.04	0.004	0.61	2647***	-0.10***	0.94***	0.68
		0.63***		0.004	0.04***	2.98**	2011***	-0.12***	0.91***	-2.18*
Number of children (# KIDS)				--		-11.05***			-1.30*	
						-10.72***			-2.00*	
						-4.02			1.18	
						-7.96***			-0.65	
Percent time spent with biological father (% DAD)					--		13,522**	-0.73***		3.86
							9,559	-0.38***		-13.65
							15,539	-0.37**		-23.43**
							13,417**	-0.63***		-1.27
Work Experience (WRK EXP)						--	614***		-0.04	
							261**		-0.08**	
							45		0.00	
							310***		-0.04*	
Family Income (INC)							--		-0.00	
									0.0002***	
									-0.00	
									0.00	
Percent time spent in poverty (% POOR)								--		-17.10*
										-7.94
										-11.53
										-0.10
HOME score (HOME)									--	3.25**
										0.03
										0.55
										3.16***
Mother's rural residence at 14		-0.55***	0.31**							
		0.81***	-0.25							
		0.46	-0.93**							
		0.02	0.04							
Mother's number of siblings		0.04	-0.04*	0.01						
		0.04*	-0.03	0.02*						
		0.04	-0.07*	0.03						
		0.05**	-0.04***	0.02**						
Grandparent's education			0.12***							
			0.14***							
			0.10**							
			0.12***							

Appendix Table A-2 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PIAT READ
Reading materials at 14		0.28*** 0.12* 0.45*** 0.24***							
Mother lived in intact family at 14	0.46*** 0.62*** 0.23 0.50***	0.06 -0.21* -0.16 -0.13		0.05** 0.01 0.02 0.04**					
Grandmother employed when mother 14					0.65 2.56* 3.43* 1.49*				
Mother's AFQT score					0.01 0.03** 0.02* 0.01*			-0.00 -0.002 -0.001 -0.001	0.02** 0.02*** 0.003 0.02***
Mother had first quarter birth		-0.20* -0.18* -0.19 -0.18**							
Mother's ideal number of children	-0.05 -0.06 0.05 -0.02		0.07*** 0.01 0.03 0.03**						
Traditional family attitudes				0.06** 0.09** 0.08* 0.07***					
Age at menarche	0.10** 0.03 0.24*** 0.11***								
Marijuana/hashish before 15	-0.99*** -0.49 -1.07*** -0.92***	-0.02 0.43* 0.35 0.20							
Prior pregnancy	0.86*** 1.05*** 0.91** 0.97***								
Poverty rate	-12.70** -2.38 24.29** -1.13								

Appendix Table A-2 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	FIAT READ
Poverty rate	-12.70** -2.38 24.29** -1.13								
Average AFDC payment	-0.001 -0.00 0.01*** 0.001*								
Unmet need for family planning	-0.000 0.002 -0.000 0.004								
Child's sex				-0.004 -0.06** 0.06 -0.01					0.28 -4.12*** 0.75 -1.15*
Black T:	-1.10***	1.20***	-0.23***	-0.46***	-1.83	-771	0.06	-1.98***	7.01**
Hispanic T:	-0.04	0.21*	0.05	-0.04*	2.43*	-465	0.04*	-0.93***	0.30
Missing data indicator	-0.13 0.23 -0.70** -0.18	-0.19 -0.28* 0.26 -0.12	-0.13* 0.05 0.14 -0.05	0.01 0.03 0.05 0.02	-0.75 -3.81* 1.69 -0.37	-1641 -648 -1200 -1255	0.01 0.03 0.07* 0.03*	-0.01 -0.06 0.11 0.12	-1.03 -0.47 5.92** 0.14

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C19, B:C23, H: C30, T: C43).

Key: Figures in cell are as follows: 1st=white, 2nd=black, 3rd=Hispanic, 4th=total. Significance levels: *p≤.10; **p≤.05; ***p≤.01. NA designates that initial estimate was not significant at at least the .05 level.

Appendix Table A-3. Two-stage Least Squares Estimates of Parameters in Structural Equation Models: PIAT Mathematics Performance, by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PIAT MATH
Constant	W:	10.52***	1.08	2.65***	-0.65***	-10.68	-6,443	1.52***	3.43	112.91***
	B:	9.68***	1.16	6.83***	-1.34***	32.14	-27,793***	2.79***	24.50**	41.72*
	H:	8.36***	-0.03	4.76***	-0.11	6.92	-18,930**	1.36***	-1.46	84.14***
	T:	10.15***	-0.74	4.45***	-0.53***	-9.38	-17,343***	1.72***	6.39**	99.52***
Age at first birth (AFB)		--	0.45***	-0.07**	0.05***			0.04**	0.30**	
			0.51***	-0.20***	0.03*			-0.04**	-0.47*	
			0.52***	-0.12**	0.03			0.02	0.24	
			0.55***	-0.13***	0.03***			0.02**	0.06	
Highest grade completed (HGC)		0.76***		0.04	0.03**	3.94**	383	-0.11***	0.94**	0.19
		0.72***	--	-0.10*	0.07***	-0.41	2,903***	-0.11***	0.22	3.41**
		0.33***		-0.05	0.01	0.89	2,439***	-0.09***	0.99***	-0.68
		0.63***		0.003	0.04***	3.32**	1,958***	-0.12***	0.94***	0.83
Number of children (# KIDS)				--		-8.35**			-0.92	
						-10.31***			-2.24**	
						-3.84			1.22	
						-6.55**			-0.57	
Percent time spent with biological father (% DAD)					--		12,110*	-0.86***		-0.19
							6,634	-0.33**		-2.87
							13,979*	-0.27*		-15.64*
							12,239**	-0.69***		-11.96**
Work Experience (WRK EXP)						--	661***		-0.04	
							307***		-0.08**	
							70		-0.002	
							340***		-0.05*	
Family Income (INC)							--		-0.000	
									0.0002**	
									-0.00	
									0.000*	
Percent time spent in poverty (% POOR)								--		-9.30
										5.99
										-14.33
										-5.10
HOME score (HOME)									--	-1.25
										0.48
										2.21
										-0.45
Mother's rural residence at 14		-0.60***	0.32**							
		0.81***	-0.24							
		0.67*	-1.14***							
		0.01	0.02							
Mother's number of siblings		0.04	-0.03	0.01						
		0.04*	-0.03	0.02						
		0.04	-0.06	0.02						
		0.05**	-0.04**	0.02**						

Appendix Table A-3 (continued)

	AFB	HGC	# KIDS	% BAD	WORK EXP	INC	% POOR	HOME	PIAT MATH
Grandparent's education		0.11*** 0.14*** 0.10** 0.12***							
Reading materials at 14		0.29*** 0.12* 0.44*** 0.24***							
Mother lived in intact family at 14	0.46*** 0.61*** 0.21 0.49***	-0.20* -0.20* -0.12 -0.12		0.06** -0.001 0.02 0.04**					
Grandmother employed when mother 14					0.71 3.26** 3.57* 1.75*				
Mother's AFQT score					0.01 0.03** 0.02* 0.01			-0.001 -0.002 -0.001 -0.002	0.02** 0.01 0.004 0.02***
First quarter birth		-0.16 -0.19 -0.27 -0.18*							
Mother's ideal number of children	-0.07 -0.06 0.03 -0.03		0.07*** -0.000 0.03 0.03*						
Traditional family attitudes				0.06** 0.08** 0.06 0.07***					
Age at menarche	0.09** 0.04 0.22*** 0.11***								
Marijuana/hashish before 15	-0.96*** -0.47 -1.12*** -0.90***	0.003 0.42* 0.50 0.22*							
Prior pregnancy	0.84*** 1.09*** 0.90** 0.97***								
Poverty rate	-11.08** -2.68 18.15* -1.29								

Appendix Table A-3 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PIAT MATH
Average AFDC payment	-0.001 -0.000 0.004*** 0.001**								
Unmet need for family planning	0.004 0.002 0.01 0.007								
Child's sex				-0.01 -0.06** 0.05 -0.01					0.29 -2.12* 1.57 -1.17*
Black T:	-1.09***	1.22***	-0.24***	-0.45***	-2.73	-1,120	0.03	-1.95***	-8.71***
Hispanic T:	-0.01	0.18	0.04	-0.04	1.71	-628	0.04*	-0.96***	-3.06**
Missing data indicator	-0.14 0.27 0.59** -0.14	-0.17 -0.27* 0.21 -0.13	-0.11 0.03 0.17 -0.04	0.004 0.03 0.03 0.01	-0.69 -3.75* 1.77 -0.26	-880 -309 -693 -802	0.01 0.02 0.06 0.02	0.05 0.09 0.10 0.19	-1.24 -0.20 2.39 -0.61

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C18, B: C22, H: C29, T: C45).

Key: Figures in cell are as follows: 1st=white, 2nd=black, 3rd=Hispanic, 4th=total. Significance levels: *p≤.10; **p≤.05; ***p≤.01. NA designates that initial estimate was not significant at at least the .05 level.

Appendix Table A-4. Two-stage Least Squares Estimates of Parameters in Structural Equation Model: Peabody Picture Vocabulary Test - Revised (PPVT-R) Score, by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PPVT
Constant	W:	10.86***	1.36*	2.53***	-0.65***	-12.36	-11,095	1.61***	3.39	102.50***
	B:	9.58***	1.03	6.63***	-1.19***	19.03	-29,029***	2.67***	22.61**	63.73**
	H:	9.72***	0.16	5.14***	-0.10	3.98	-16,380**	1.45***	-2.59	69.35***
	T:	10.32***	-0.61	4.35***	-0.48***	-9.44	-19,960***	1.72***	7.83***	103.66***
Age at first birth (AFB)		--	0.44***	-0.06**	0.04***			0.03**	0.36***	
			0.52***	-0.20***	0.03*			-0.03*	-0.40*	
			0.51***	-0.14***	0.04*			0.01	0.35*	
			0.54***	-0.13***	0.03***			0.02**	0.09	
Highest grade completed (HGC)		0.74***	--	0.05	0.04**	4.31***	1,049	-0.11***	0.86**	-1.15
		0.70***		-0.09*	0.06***	0.63	3,032***	-0.12***	0.28	-1.72
		0.32***		-0.05	-0.01	0.74	2,434***	-0.10***	0.81**	-0.96
		0.60***		0.00	0.03***	3.33***	2,255***	-0.12***	0.79***	-1.12
Number of children (# KIDS)				--		-8.99**			-1.17*	
						-9.35**			-2.15**	
						-2.77			1.33	
						-6.70**			-0.92*	
Percent time spent with biological father (% DAD)					--		11,751*	-0.78***		-14.72**
							11,491*	-0.43***		-5.51
							9,923	-0.21		-19.08**
							13,242***	-0.68***		-21.06***
Work Experience (WRK EXP)						--	543**		-0.04	
							226**		-0.07**	
							111		-0.01	
							274**		-0.06**	
Family Income (INC)							--		-0.00	
									0.0002***	
									-0.00	
									0.00**	
Percent time spent in poverty (% POOR)								--		-15.88**
										-5.57
										-18.94
										-17.91***
HOME score (HOME)									--	0.92
										2.10**
										2.47
										0.96
Mother's rural residence at 14		-0.56***	0.29**							
		0.74***	-0.21							
		0.50	-1.21***							
		0.04	0.001							
Mother's number of siblings		0.03	-0.03	0.01						
		0.05*	-0.04*	0.02						
		0.05	-0.09*	0.02						
		0.05***	-0.05***	0.02**						
Grandparent's education			0.10***							
			0.14***							
			0.11**							
			0.11***							

Appendix Table 4. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PPVT
Reading materials at 14		0.31*** 0.13** 0.51*** 0.27***							
Mother lived in intact family at 14	0.44*** 0.56*** 0.17 0.46***	0.11 -0.18 -0.07 -0.08		0.07*** 0.004 0.04 0.05***					
Grandmother employed when mother 14					0.45 2.90* 3.50* 1.55*				
Mother's AFQT score					0.01 0.02** 0.02** 0.01			-0.001 -0.002 -0.00 -0.00	0.02** 0.03*** 0.01 0.02***
First Quarter Birth		-0.15 -0.19 -0.56* -0.22**							
Mother's ideal number of children	-0.05 -0.06 -0.002 -0.02		0.07*** -0.0001 0.02 0.03*						
Traditional family attitudes				0.06** 0.07** 0.04 0.06***					
Age at menarche	0.10** 0.04 0.26*** 0.12***								
Marijuana/hashish before 15	-0.97*** -0.50* -1.13*** -0.93***	-0.03 0.46* 0.51 0.22*							
Prior pregnancy	0.84*** 1.08*** 0.93*** 0.96***								
Poverty rate	-12.46** -2.16 4.36 -1.55								
Average AFDC payment	-0.001 -0.0001 0.004*** 0.001*								

Appendix Table 4. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	ENG	% POOR	HOME	PPVT
Unmet need for family planning	0.002 0.002 0.03 0.008*								
Child's sex				-0.01 -0.06** 0.04 -0.1					-0.10 0.54 5.86** 0.79
Black T:	-1.02***	1.23***	-0.23***	-0.44***	-2.37	-1,133	0.04	-1.70***	-15.58***
Hispanic T:	0.16	0.06	0.06	-0.03	1.81	-55	0.03	-0.88***	-11.12***
Missing data indicator	-0.10 0.25 -0.70** -0.17	-0.19 -0.27* 0.28 -0.11	-0.11 0.02 0.10 -0.05	0.01 0.03 0.02 0.01	-0.003 -2.60 1.21 0.23	-1,208 -609 -1,567 -1,069	0.01 0.01 0.07* 0.02	0.06 -0.04 0.22 0.17	-0.76 0.20 2.35 0.45

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C21, B: C25, H: C32, T: C46).

Key: Figures in cell are as follows: 1st=white, 2nd=black, 3rd=Hispanic, 4th=total. Significance levels: *p ≤ .10; **p ≤ .05; ***p ≤ .01. NA designates that initial estimate was not significant at at least the .05 level.

Table A-5. Two-stage Least Squares Estimates of Parameters in Structural Equation Model: Behavior Problems Index (BPI) by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	BPI
Constant	W:	11.33***	1.10	2.46***	-0.64***	-13.76	-9,372	1.51***	4.92**	154.34***
	B:	9.85***	1.01	6.66***	-1.05***	27.46	30,516***	2.67***	18.07**	99.97***
	H:	9.40***	1.45	4.50***	0.23	-4.82	-10,601	1.60***	0.25	105.59***
	T:	10.39***	-0.70	4.24***	-0.42**	-10.07	-17,855***	1.70***	9.42***	130.73***
Age at first birth (AFB)		--	0.45***	-0.06**	0.04***			0.04**	0.30**	
			0.52***	-0.21***	0.03*			-0.03*	-0.25	
			0.46***	-0.11**	0.02			-0.01	0.23	
			0.55***	-0.13***	0.03***			0.03**	0.05	
Highest grade completed (HGC)		0.71***	--	0.04	0.03**	4.61***	864	-0.11***	0.85**	-3.80**
		0.67***		-0.08	0.05**	-0.12	3,144***	-0.11***	0.37	0.84
		0.32***		-0.04	-0.01	2.11	2,245***	-0.09***	0.79**	2.38
		0.59***		0.01	0.03***	3.63***	2,149***	-0.12***	0.78***	-1.33
Number of children (# KIDS)				--		-9.37**			-1.40**	
						-10.12***			-1.71*	
						-1.97			1.06	
						-7.31***			-1.27**	
Percent time spent with biological father (% DAD)					--		11,183*	-0.88***		-9.28
							10,465*	-0.46***		10.74
							5,122	-0.10		-6.08
							10,929**	-0.74***		-4.73
Work Experience (WRK EXP)							590***		-0.04	
							235**		-0.07**	
							104		-0.03	
							319***		-0.07**	
Family Income (INC)							--		-0.00	
									0.0002***	
									-0.00	
									0.00**	
Percent time spent in poverty (% POOR)								--		-1.42
										8.48
										11.69
										2.19
HOME score (HOME)									--	-0.11
										-0.38
										-1.39
										-0.35
Mother's rural residence at 14		-0.64***	0.32**							
		0.71***	-0.20							
		0.50	-1.16***							
		-0.01	0.02							
Mother's number of siblings		0.02	-0.02	0.01						
		0.05*	-0.03*	0.02						
		0.06	-0.11**	0.03						
		0.05**	-0.05***	0.02**						
Grandparent's education			0.09***							
			0.14***							
			0.09**							
			0.11***							

Appendix Table A-5. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	BPI
Reading materials at 14		0.34*** 0.13** 0.56*** 0.29***							
Mother lived in intact family at 14	0.47*** 0.60*** 0.17 0.50***	0.12 -0.21* -0.16 -0.12		0.06** -0.0001 0.05 0.05**					
Grandmother employed when mother 14					0.33 3.49** 3.72* 1.62*				
Mother's AFQT score					0.003 0.03** 0.01 0.01			-0.00 -0.002 0.001 -0.001	0.01 -0.01 -0.01 0.001
First Quarter Birth		-0.12 -0.16 -0.67** -0.22**							
Mother's ideal number of children	-0.06 -0.06 0.01 -0.03		0.06** 0.01 0.02 0.03*						
Traditional family attitudes				0.06** 0.06* 0.01 0.05***					
Age at menarche	0.10** 0.06 0.29*** 0.13***								
Marijuana/hashish before 15	-0.93*** -0.54* -1.10** -0.90***	-0.03 0.51** 0.55 0.23*							
Prior pregnancy	0.83*** 1.03*** 0.87** 0.93***								
Poverty rate	-13.19** -1.86 -0.78 -1.40								
Average AFDC payment	-0.001 -0.0002 0.004*** 0.001**								

Appendix Table A-5. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	BPI
Unmet need for family planning	0.002 -0.001 0.04** 0.01*								
Child's sex				-0.003 -0.07** 0.07* -0.01					1.38 2.18* 0.86 0.90
Black T:	-1.08***	1.28***	-0.24***	-0.45***	-3.04*	-2,451	0.02	-1.75***	-2.10
Hispanic T:	0.08	0.09	0.06	-0.04*	2.83**	-214	0.01	-0.84***	-1.87
Missing data indicator	-0.05 0.16 -0.72** -0.18	-0.22* -0.27* 0.32 -0.10	-0.09 0.001 0.05 -0.05	0.02 0.03 0.01 0.02	-0.17 -2.60 0.98 -0.12	-905 -580 -1677 -920	0.004 0.02 0.06 0.02	0.02 -0.09 0.15 0.08	-0.97 -0.66 0.01 -0.07

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C20, B: C24, H: C31, T: C47).

Key: Figures in cell are as follows: 1st = white, 2nd = black, 3rd = Hispanic, 4th = total. Significance levels: *p ≤ .10; **p ≤ .05; ***p ≤ .01. NA designates that initial estimate was not significant at at least the .05 level 3rd = Hispanic, 4th = total.

Appendix Table A-6. Two-stage Least Squares Estimates of Parameters in Structural Equation Model: Insignificant Endogenous Paths Eliminated, PIAT Reading Recognition Performance, by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PIAT READ
Constant	W:	10.73***	1.14	2.60***	-0.67***	-2.75	-3,628	1.60***	2.86*	113.10***
	B:	9.65***	1.00	6.51***	-1.00***	29.34***	29,472***	2.76***	12.87***	94.20***
	H:	7.19***	1.03	4.64***	0.49***	4.62	11,406**	1.65***	7.30***	104.41***
	T:	10.22***	-0.65	4.37***	-0.52***	-3.70	-18,122***	1.76***	4.84***	68.68***
Age at first birth (AFB)		--	0.44***	-0.04**	0.05***			0.03**	0.03**	
			0.52***	-0.25***	NA			-0.04**	NA	
			0.47***	-0.14***	NA			NA	NA	
			0.55***	-0.13***	0.03***			0.02**	NA	
Highest grade completed (HGC)		0.76***			0.03**	3.59**	NA	-0.12***	0.73**	-6.08**
		0.71***	--		0.09***	NA	3,122***	-0.11***	NA	NA
		0.34***			NA	NA	2,762***	-0.09***	0.70***	NA
		0.63***			0.04***	2.98**	2,011***	-0.12***	1.13***	NA
Number of children (# KIDS)				--		-11.05***				
						-10.64***				
						NA				
						-7.96***				
Percent time spent with biological father (% DAD)					--		14,117**	-0.73***		NA
							NA	-0.38***		NA
							NA	-0.27*		-20.88**
							13,417**	-0.63***		NA
Work Experience (WRK EXP)						--	674***		NA	
							335***		-0.05	
							NA		NA	
							310***		NA	
Family Income (INC)							--		NA	
									0.00***	
									NA	
									NA	
Percent time spent in poverty (% POOR)								--		-20.11***
										NA
										NA
										NA
HOME score (HOME)									--	3.40***
										NA
										NA
										1.85***
Mother's rural residence at 14		-0.55***	0.31**							
		0.81***	-0.25							
		0.46	-0.93**							
		0.02	0.04							
Mother's number of siblings		0.04	-0.04*	0.01						
		0.04*	-0.03	0.03**						
		0.04	-0.07*	0.03*						
		0.05**	-0.04***	0.02***						

Appendix Table A-6 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	FIAT READ
Grandparent's education		0.12*** 0.14*** 0.10** 0.12***							
Reading materials at 14		0.28*** 0.12* 0.45*** 0.24***							
Mother lived in intact family at 14	0.46*** 0.62*** 0.23 0.50***	0.06 0.21* -0.16 -0.13		0.05** 0.02 0.03 0.04**					
Grandmother employed when mother 14					0.65 2.55* 3.62* 1.49*				
Mother's AFQT score					0.01 0.02*** 0.03*** 0.01*			-0.001 -0.00 0.00 -0.002**	0.02** 0.03*** 0.02*** 0.01***
Mother had first quarter birth		-0.20* -0.18 -0.19 -0.18**							
Mother's ideal number of children	-0.05 -0.06 0.05 -0.02		-.007*** 0.001 0.03 0.03**						
Traditional family attitudes				0.06** 0.09** 0.06 0.07***					
Age at menarche	0.10** 0.03 0.24*** 0.11***								
Marijuana/hashish before 15	-0.99*** -0.49 -1.07*** -0.92***	-0.02 0.43* 0.35 0.20							
Prior pregnancy	0.86*** 1.05*** 0.91** 0.97***								
Poverty rate	-12.70** -2.38 24.29** -1.13								

Appendix Table A-6 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	FLAT READ
Average AFDC payment	-0.001 -0.00 0.005*** 0.001*								
Unmet need for family planning	-0.00 0.002 -0.00 0.004								
Child's sex				-0.005 -0.06** 0.07* -0.01					0.46 -3.33** -0.86 -1.48**
Black T:	-1.10***	1.20***	-0.23***	-0.46***	-1.83	-771	0.06	-2.53***	3.21***
Hispanic T:	-0.04	0.21*	0.05	-0.04*	2.43*	-465	0.04*	-1.14***	-1.35
Missing data indicator	-0.13 0.23 -0.70** -0.18	-0.19 -0.28* 0.26 -0.12	-0.14* 0.07 0.13 -0.05	0.01 0.04 0.03 0.02	-0.75 -3.79* 0.76 -0.37	-1,743 -202 -1,042 -1,255	0.01 0.03 0.05 0.03*	0.19 -0.19 0.21 0.10	-0.97 -1.25 4.85*** 0.48

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C19E, B: C23E, H: C30E, T: C44).

Key: Figures in cell are as follows: 1st=white, 2nd=black, 3rd=Hispanic, 4th=total. Significance levels: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$. NA designates that initial estimate was not significant at at least the .05 level.

Appendix Table A-7. Two-stage Least Squares Estimates of Parameters in Structural Equation Models: Insignificant Endogenous Paths Eliminated, PIAT Mathematics Performance, by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PIAT MATH
Constant	W:	10.52***	1.08	2.66***	-0.65***	-10.68	2,091	1.52***	2.90*	89.42***
	B:	9.68***	1.30	6.68***	-1.00***	27.11***	-28,871***	2.79***	2.63	59.11***
	H:	8.35***	0.95	4.65***	0.55***	4.28	-11,035***	1.45***	7.40***	86.67***
	T:	10.15***	-0.74	4.44***	-0.53***	-9.38	-17,343***	1.72***	4.74***	93.77***
Age at first birth (AFB)		--	0.45***	-0.04**	0.05***			0.04**	0.30***	
			0.50***	-0.26***	NA			-0.04**	NA	
			0.47***	-0.15***	NA			NA	0.24	
			0.55***	-0.13***	0.03***			0.02**	NA	
Highest grade completed (HGC)		0.76***			0.03**	3.94**	NA	-0.11***	0.73**	NA
		0.72***	--		0.09***	NA	3,037***	-0.11***	1.08***	2.87***
		0.33***			NA	NA	2,705***	-0.09***	0.70***	NA
		0.63***			0.04***	3.32**	1,958***	-0.12***	1.15***	NA
Number of children (# KIDS)			--		-8.35**					
					-9.88***					
					NA					
					-6.55**					
Percent time spent with biological father (% DAD)					--		NA	-0.86***		NA
							NA	-0.33**		NA
							NA	NA		NA
							12,239**	-0.69***		-8.41**
Work Experience (WRK EXP)						--	868***		NA	
							360***		0.01	
							NA		NA	
							340***		NA	
Family Income (INC)						--				
Percent time spent in poverty (% POOR)								--		NA
										NA
										NA
										NA
HOME score (HOME)									--	NA
										NA
										NA
										NA
Mother's rural residence at 14		-0.60***	0.32**							
		0.81***	-0.24							
		0.67*	-1.11***							
		0.01	0.02							
Mother's number of siblings		0.04	-0.03	0.01						
		0.04*	-0.03	0.03**						
		0.04	-0.06	0.03*						
		0.05**	-0.04**	0.02**						

Appendix Table A-7 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PLAT MATH
Grandparent's education		0.11*** 0.14*** 0.11*** 0.12***							
Reading materials at 14		0.29*** 0.13** 0.47*** 0.24***							
Mother lived in intact family at 14	0.46*** 0.61*** 0.21 0.49***	0.08 -0.21* -0.18 -0.12		0.06** 0.02 0.03 0.04**					
Grandmother employed when mother 14					0.71 3.22** 3.85* 1.75*				
Mother's AFQT score					0.01 0.02*** 0.03*** 0.01			-0.00 -0.00 -0.00 -0.002**	0.02*** 0.01 0.02*** 0.02***
First quarter birth		-0.16 -0.21* -0.25 -0.18*							
Mother's ideal number of children	-0.07 -0.06 0.03 -0.03		0.07*** -0.01 0.03 0.03*						
Traditional family attitudes				0.06** 0.08** 0.03 0.07***					
Age at menarche	0.09** 0.04 0.22*** 0.11***								
Marijuana/hashish before 15	-0.96*** -0.47 -1.12*** -0.90***	0.003 0.42* 0.50 0.22*							
Prior pregnancy	0.84*** 1.09*** 0.90** 0.10***								
Poverty rate	-11.08** -2.68 18.15* -1.29								

Appendix Table A-7 (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PIAT MATH
Average AFDC payment	-0.000 -0.000 0.004*** 0.001**								
Unmet need for family planning	0.004 0.002 0.01 0.007								
Child's sex				-0.01 -0.06* 0.06 -0.01					-0.12 -1.88* -2.57** -1.22**
Black T:	-1.09***	1.22***	-0.24***	-0.45***	-2.73	-1,120	0.03	-2.52***	-6.37***
Hispanic T:	-0.01	0.18	0.04	-0.04	1.71	-628	0.04*	-1.14***	-2.54***
Missing data indicator	-0.14 0.27 0.59** -0.14	-0.17 -0.27* 0.15 -0.13	0.12* 0.05 0.17 -0.04	0.00 0.04 0.01 0.01	-0.69 -3.66* 0.62 -0.26	-1082 -40 -681 -802	0.01 0.02 0.05 0.02	0.18 0.00 0.23 0.18	-1.65* -0.22 1.33 -1.07

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C18E, B: C22E, H: C29E, T: C45E).

Key: Figures in cell are as follows: 1st=white, 2nd=black, 3rd=Hispanic, 4th=total. Significance levels: *p≤.10; **p≤.05; ***p≤.01. NA designates that initial estimate was not significant at at least the .05 level.

Appendix Table A-8. Two-stage Least Squares Estimates of Parameters in Structural Equation Model: Insignificant Endogenous Paths Eliminated, Peabody Picture Vocabulary Test - Revised (PPVT-R) Score, by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PPVT
Constant	W:	10.86***	1.28*	2.54***	-0.65***	-12.36	2,573	1.61***	2.75*	104.11***
	B:	9.58***	1.03	6.53***	-0.89	26.86***	-29,870***	2.36***	16.83***	41.57***
	H:	9.72***	0.16	5.05***	0.54***	2.51	-10,980**	1.45***	8.56***	75.34***
	T:	10.32***	-0.61	4.35***	-0.48***	-9.44	-19,960***	1.72***	5.26***	108.71***
Age at first birth (AFB)		--	0.44***	-0.04**	0.04***			0.03**	0.38***	
			0.52***	-0.25***	NA			NA	NA	
			0.51***	-0.16***	NA			NA	NA	
			0.54***	-0.13***	0.03***			0.02**	NA	
Highest grade completed (HGC)		0.74***	--		0.04**	4.31***	NA	0.11***	0.56*	-1.15
		0.70***			0.08***	NA	3,184***	-0.13***	NA	NA
		0.32***			NA	NA	2,761***	-0.09***	0.56***	NA
		0.60***			0.03***	3.33***	2,255***	-0.12***	1.06***	NA
Number of children (# KIDS)				--		-8.99**			NA	
						-10.08***			-1.54***	
						NA			NA	
						-6.70**			NA	
Percent time spent with biological father (% DAD)					--		NA	-0.78***		-13.04**
							NA	-0.51***		NA
							9,923	NA		-14.19*
							13,242***	-0.68***		-21.23***
Work Experience (WRK EXP)						--	854***		NA	
							317***		-0.07**	
							NA		-0.01	
							274**		-0.04*	
Family Income (INC)							--		NA	
									0.0002***	
									NA	
									0.0001**	
Percent time spent in poverty (% POOR)								--		-14.59**
										NA
										NA
										-18.35***
HOME score (HOME)									--	0.92
										2.08***
										NA
										NA
Mother's rural residence at 14		-0.56***	0.30**							
		0.74***	-0.21							
		0.50	-1.21***							
		0.04	0.001							
Mother's number of siblings		0.03	-0.03	0.01						
		0.05*	-0.04*	0.03						
		0.05	-0.09*	0.03						
		0.05***	-0.05***	0.02**						

Appendix Table 8. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PPVT
Grandparent's education		0.10*** 0.14*** 0.11** 0.11***							
Reading materials at 14		0.31*** 0.13** 0.51*** 0.27***							
Mother lived in intact family at 14	0.44*** 0.56*** 0.17 0.46***	0.11 -0.18 -0.07 -0.08		0.07*** 0.02 0.06* 0.05***					
Grandmother employed when mother 14					0.45 2.98* 3.67* 1.55*				
Mother's AFQT score					0.01 0.03*** 0.03** 0.01		-0.00 -0.001 -0.001 -0.002**	0.01*** 0.02*** 0.03*** 0.02***	
First Quarter Birth		-0.15 -0.19 -0.56* -0.22**							
Mother's ideal number of children	-0.05 -0.06 -0.002 -0.02		0.07*** -0.01 0.02 0.03*						
Traditional family attitudes				0.06** 0.07** 0.03 0.06***					
Age at menarche	0.10** 0.04 0.26*** 0.12***								
Marijuana/hashish before 15	-0.97*** -0.50* -1.13*** -0.93***	NA -0.46* 0.51 0.22*							
Prior pregnancy	0.84*** 1.08*** 0.93*** 0.96***								
Poverty rate	-12.46** -2.16 4.36 -1.55								

Appendix Table 8. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	PPVT
Average AFDC payment	-0.001 -0.0001 0.004*** 0.001*								
Unmet need for family planning	0.002 0.002 0.03 0.008*								
Child's sex				-0.01 -0.06** 0.06* -0.01					-0.21 0.87 2.71* 0.62
Black T:	-1.02***	1.23***	-0.23***	-0.44***	-2.37	-1,133	0.04	-2.10***	-18.06***
Hispanic T:	0.16	0.06	0.06	-0.03	1.81	-55	0.03	-1.05***	-12.17***
Missing data indicator	-0.10 0.25 -0.70** -0.17	-0.19 -0.27* 0.28 -0.11	-0.12* 0.04 0.09 -0.05	0.01 0.04 -0.001 0.01	-0.003 -2.72 0.51 0.23	-1,603 -228 -1,637 -1,069	0.01 0.01 0.07* 0.02	0.18 -0.17 0.20 0.24	-0.53 0.35 0.09 0.62

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C21E, B: C25E, H: C23E, T: C46E).

Key: Figures in cell are as follows: 1st = white, 2nd = black, 3rd = Hispanic, 4th = total. Significance levels: *p ≤ .10; **p ≤ .05; ***p ≤ .01. NA designates that initial estimate was not significant at at least the .05 level.

Table A-9. Two-stage Least Squares Estimates of Parameters in Structural Equation Model: Insignificant Endogenous Paths Eliminated, Behavior Problems Index (BPI) by Race/Ethnicity

		AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	BPI
Constant	W:	11.33***	1.10	2.46***	-0.64***	-13.76	2,647	1.51***	5.68**	152.65***
	B:	9.85***	1.01	6.55***	-0.73***	26.05***	-30,405***	2.34***	13.10***	112.47***
	H:	9.40***	1.45	4.34***	0.58***	-4.82	-8,396*	1.44***	8.39***	110.62***
	T:	10.39***	-0.70	4.23***	-0.42**	-10.07	-17,855***	1.70***	10.21***	114.65***
Age at first birth (AFB)		-	0.45***	-0.03*	0.04***			0.04**	0.31***	
			0.52***	-0.25***	NA			NA	NA	
			0.46***	-0.13***	NA			NA	NA	
			0.55***	-0.12***	0.03***			0.03**	NA	
Highest grade completed (HGC)		0.71***		NA	0.03**	4.61***	NA	-0.11***	0.58**	-4.51***
		0.67***	--	NA	0.07***	NA	3,204***	-0.13***	NA	NA
		0.32***		-0.04	NA	NA	2,559***	-0.09***	0.53***	NA
		0.59***		NA	0.03***	3.63***	2,149***	-0.12***	0.82***	NA
Number of children (# KIDS)				-		-9.37**			-0.85*	
						-10.00***			NA	
						NA			NA	
						-7.31***			-1.38***	
Percent time spent with biological father (% DAD)					-		NA	-0.88***		NA
							NA	-0.53***		NA
							NA	NA		NA
							10,929**	-0.74***		NA
Work Experience (WRK EXP)						-	865***		NA	
							320***		-0.05*	
							NA		NA	
							319***		-0.07**	
Family Income (INC)							--		NA	
									0.0002***	
									NA	
									0.00**	
Percent time spent in poverty (% POOR)								--		NA
										NA
										NA
										NA
HOME score (HOME)									-	NA
										NA
										NA
										NA
Mother's rural residence at 14		-0.64***	0.32**							
		0.71***	-0.20							
		0.50	-1.16***							
		-0.01	0.02							
Mother's number of siblings		0.02	-0.02	0.01						
		0.05*	-0.03*	0.02*						
		0.06	-0.11**	0.03						
		0.05**	-0.05***	0.02**						

Appendix Table A-9. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	BFI
Grandparent's education		0.09*** 0.14*** 0.09** 0.11***							
Reading materials at 14		0.34*** 0.13** 0.56*** 0.29***							
Mother lived in intact family at 14	0.47*** 0.60*** 0.17 0.50***	0.12 -0.21* -0.16 -0.12		0.06** 0.02 0.05 0.05**					
Grandmother employed when mother 14					0.33 3.47** 4.14* 1.62*				
Mother's AFQT score					0.003 0.03*** 0.03*** 0.007		-0.00 -0.0002 0.001 -0.001	0.01* -0.01*** -0.01* -0.01***	
First Quarter Birth		-0.12 -0.16 -0.67** -0.22**							
Mother's ideal number of children	-0.06 -0.06 0.01 -0.03		0.06*** 0.01 0.02 0.03**						
Traditional family attitudes				0.06** 0.06* 0.01 0.05***					
Age at menarche	0.10** 0.06 0.29*** 0.13***								
Marijuana/hashish before 15	-0.93*** -0.54* -1.10** -0.90***	-0.03 0.51** 0.55 0.23*							
Prior pregnancy	0.83*** 1.03*** 0.87** 0.93***								
Poverty rate	-13.19** -1.86 -0.78 -1.40								

Appendix Table A-9. (continued)

	AFB	HGC	# KIDS	% DAD	WORK EXP	INC	% POOR	HOME	BPI
Average AFDC payment	-0.001 -0.0002 0.004*** 0.001**								
Unmet need for family planning	0.002 -0.001 0.04* 0.01*								
Child's sex				-0.003 -0.07** 0.09* -0.01					1.34 1.78* 1.07 1.13*
Black T:	-1.08***	1.28***	-0.23***	-0.45***	-3.04*	-2,451	0.02	-1.83***	-1.39*
Hispanic T:	0.08	0.09	0.06	-0.04*	2.83**	-214	0.01	-0.83***	-1.55*
Missing data indicator	-0.05 0.16 -0.72** -0.18	-0.22* -0.27* 0.32 -0.10	-0.11 0.02 0.04 -0.05	0.02 0.03 -0.01 0.02	-0.17 -2.57 0.31 -0.12	-1050 -296 -1737 -920	0.004 0.02 0.07 0.02	0.05 -0.16 0.07 0.08	-1.18 -0.24 0.74 0.71

Source: Child Trends, Inc. based on public use files from the National Longitudinal Survey of Youth-Child Supplement, 1986 and 1988 data. (W: C20E, B: C24E, H: C31E, T: C47E).

Key: Figures in cell are as follows: 1st=white, 2nd=black, 3rd=Hispanic, 4th=total. Significance levels: *p ≤ .10; **p ≤ .05; ***p ≤ .01. NA designates that initial estimate was not significant at at least the .05 level.

APPENDIX B
DESCRIPTION OF POVERTY
VARIABLE CONSTRUCTION

Calculation of Poverty Indicator

Three components were used in the calculation of our poverty indicator using the NLSY data -- (a) family income, (b) family size, and (c) the poverty threshold. Each will be discussed in turn.

(a) **Family income.** The NLSY proved to be fairly straightforward in terms of the availability of family income data. However, although a "key" variable for total family income was provided on the file for each survey year, we found that the extent of missing data on the variable was somewhat high relative to data availability for other measures. This prompted us to develop an alternate strategy for measuring family income for respondents who were missing on the "key" variable. We used the coding procedures outlined by the Center for Human Resource Research (CHRR) staff at Ohio State for the creation of their poverty indicators to sum individual components of family income that were reported by respondents. Unlike CHRR, we calculated a total family income variable for a respondent even if they failed to report a particular source of income for all twelve months of the previous year. For example, respondents were asked about AFDC receipt for each of the previous 12 months and then the average amount they received per month. If a particular respondent replied "yes" for only 6 out of the 12 months being considered, CHRR did not assign a total income value to them. Rather than exclude the case from our analyses, however, we pro-rated the amount reported according to the number of months it was received. This alternate version of family income was only developed for respondents who were missing on the "key" variable version.

(b) **Family Size.** The creation of a family size variable was straightforward. For each respondent we scanned the household record "relationship to respondent variables" for age 27 and summed the number of family members residing in the respondent's household.

(c) **Poverty threshold.** Official government thresholds have changed several times in the past decade. Since 1982, official thresholds have eliminated the distinction of the sex of the family head. Thresholds have been based solely on family size and, if a one or two person family, whether or not the head was 65 years of age or older. Rather than applying different standards across the many years of our analysis, we opted to use the consistent, current definition of poverty status.

We used the current poverty threshold values, published in the Statistical Abstract of the United States (SAUS) and interpolated annual threshold values for 1973 to the present (see Table 1). For years the SAUS has not published threshold values, we used the Consumer Price Index to interpolate values, proceeding in the same manner as for the official statistics. Also, following current definitions, we used poverty thresholds based solely on family size (one person up to nine-plus persons), except for one- and two-person families, which were also categorized by the head being less than 65 years of age or 65 years of age or older.

Knowing the family size, the age of the head, and the year, the poverty threshold was provided by a simple look-up table procedure. If the family income was below the threshold, then it was categorized as in poverty, otherwise not.

Table 1. Average Poverty Levels Based on Money Income for Families and Unrelated Individuals: 1960 to 1987

Year	Family Size and Type													
	1		2		3	4	5	6	7+	7	8	9+		
	Both <65	65+	Both <65	65+										
1960	1491.	1513.	1420.	1926.	1987.	1791.	2364.	3027.	3570.	4013.	4934.	0.	0.	0.
1961	1506.	1549.	1434.	1946.	2007.	1809.	2388.	3058.	3606.	4053.	4984.	0.	0.	0.
1962	1521.	1564.	1449.	1965.	2027.	1828.	2412.	3088.	3643.	4094.	5034.	0.	0.	0.
1963	1541.	1585.	1468.	1991.	2054.	1852.	2444.	3129.	3691.	4148.	5101.	0.	0.	0.
1964	1561.	1606.	1487.	2017.	2081.	1876.	2476.	3170.	3739.	4203.	5168.	0.	0.	0.
1965	1586.	1632.	1511.	2050.	2114.	1906.	2516.	3221.	3799.	4270.	5251.	0.	0.	0.
1966	1632.	1678.	1554.	2109.	2174.	1961.	2588.	3313.	3908.	4392.	5401.	0.	0.	0.
1967	1682.	1730.	1602.	2174.	2242.	2021.	2668.	3416.	4029.	4528.	5568.	0.	0.	0.
1968	1753.	1803.	1669.	2265.	2336.	2106.	2780.	3559.	4198.	4718.	5801.	0.	0.	0.
1969	1848.	1901.	1760.	2388.	2463.	2221.	2931.	3753.	4427.	4975.	6118.	0.	0.	0.
1970	1954.	2010.	1861.	2525.	2604.	2348.	3099.	3968.	4680.	5260.	6468.	0.	0.	0.
1971	2051.	2106.	1943.	2639.	2723.	2452.	3232.	4140.	4892.	5507.	6792.	0.	0.	0.
1972	2116.	2173.	2005.	2724.	2810.	2531.	3335.	4273.	5049.	5684.	7010.	0.	0.	0.
1973	2248.	2308.	2130.	2893.	2985.	2688.	3543.	4539.	5363.	6038.	7446.	0.	0.	0.
1974	2496.	2563.	2365.	3213.	3314.	2985.	3934.	5040.	5955.	6704.	8267.	0.	0.	0.
1975	2724.	2797.	2581.	3506.	3617.	3257.	4293.	5500.	6499.	7316.	9022.	0.	0.	0.
1976	2891.	2962.	2727.	3703.	3823.	3441.	4533.	5809.	6877.	7770.	9624.	0.	0.	0.
1977	3079.	3154.	2904.	3944.	4072.	3664.	4828.	6187.	7325.	8275.	10250.	0.	0.	0.
1978	3313.	3394.	3124.	4243.	4381.	3943.	5194.	6657.	7881.	8903.	11028.	0.	0.	0.
1979	3589.	3779.	3479.	4725.	4878.	4390.	5784.	7412.	8775.	9914.	12280.	0.	0.	0.
1980	4190.	4290.	3949.	5363.	5537.	4983.	6565.	8414.	9966.	11269.	13955.	0.	0.	0.
1981	4620.	4729.	4359.	5917.	6111.	5498.	7250.	9287.	11007.	12449.	0.	14110.	15655.	18572.
1982	4901.	5019.	4626.	6281.	6487.	5936.	7691.	9862.	11684.	13207.	0.	15036.	16719.	19698.
1983	5061.	5180.	4775.	6483.	6697.	6023.	7938.	10178.	12049.	13630.	0.	15500.	17170.	20310.
1984	5278.	5400.	4979.	6762.	6983.	6282.	8277.	10609.	12566.	14207.	0.	16096.	17961.	21247.
1985	5469.	5593.	5156.	6998.	7231.	6503.	8573.	10989.	13007.	14696.	0.	16656.	18512.	22083.
1986	5572.	5701.	5255.	7138.	7372.	6630.	8737.	11303.	13259.	14986.	0.	17049.	18791.	22497.
1987	5578.	5909.	5447.	7397.	7641.	6872.	9056.	11611.	13737.	15509.	0.	17649.	19515.	23105.
1988	6024.	6155.	5674.	7704.	7958.	7158.	9436.	12092.	14305.	16149.	0.	18248.	20279.	24133.