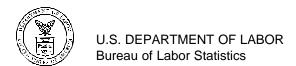# BLS WORKING PAPERS

U.S. DEPARTMENT OF LABOR
Bureau of Labor Statistics

OFFICE OF COMPENSATION AND WORKING
CONDITIONS

Maternal Employment and Adolescent Risky Behavior

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First draft: April 2002
Current version: December 2002

Abstract: This paper examines the impact of maternal employment during a child's first three years and during adolescence on his or her decisions to engage in a range of risky behaviors: smoking cigarettes, drinking alcohol, using marijuana and other drugs, engaging in sex and committing crimes. Using data from the NLSY79 and its young adult supplement, we find little evidence that mother's employment early in the child's life has lasting consequences on participation in risky behaviors. Similarly, with the possible exception of drinking alcohol—our results do not indicate that maternal employment during adolescence is correlated with increased involvement in risky activities.

Adolescence is a period of rapid physical, intellectual and emotional change. Many teens experiment with smoking, alcohol, marijuana and other drugs, become sexually active, and, to a lesser extent, participate in other illicit activities. While recent years have seen divergent trends in teen participation in such activities, the levels of such behavior are still cause for concern (Gruber, 2000). For many teens, there are few long-term consequences from engaging in this kind of behavior. But for those who become addicted to cigarettes, alcohol or drugs, who unintentionally become pregnant, or who find themselves with a criminal record, the costs to themselves, their families and society as a whole can be tremendous (Figlio and Ludwig, 2000; Pergamit, Huang, and Lane, 2001).

Owing to the rapid rise in labor force participation by women with children in recent decades and the resulting changes in arrangements for child care and parent-child relationships more generally, a large literature crossing disciplinary lines has examined the impact of maternal employment on children. Interestingly, recent work challenges the conventional wisdom that children are now spending less time with their parents than they had in the past, a subject to which we will return (Bianchi, 2000; Sandberg and Hofferth, 2001). Researchers have focused, for the most part, on the cognitive outcomes of children who are quite young, paying less attention to possible effects on children above elementary school age.[1] In this study, we aim to fill part of this gap by examining the relationship between maternal employment and risky behavior by adolescents, that is, participation by teens in activities that have potentially harmful long-term consequences.

In this effort, we use the National Longitudinal Survey of Youth, 1979 (NLSY79), and, in particular, its young adult supplement to analyze the decisions of children aged 15 and above

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[1] Harvey (1999) and Ruhm (2001) provide surveys of this part of the literature.

with respect to a range of risky activities: smoking cigarettes, drinking alcohol, using marijuana and other drugs, engaging in sex and committing crimes.[2] Although there are many factors that influence such behaviors—including the actions and attitudes of one's peers, neighborhood conditions, and genetic pre-dispositions—there is a consensus among developmental psychologists on the primacy of the mother-child relationship. Though this bond can be affected by a mother's decision to work at any time during a child's life, we focus on two time spans: the first three years of the child's life and the period of adolescence itself.[3] The recent shift in welfare policy in the U.S. to encourage or require mothers with young children to work underscores the need to understand the effects of maternal employment on children and adolescents.

I. Background

> "If we want to have a real significant impact, not only on children's success in school and later on in life, healthy relationships, but also an impact on reduction in crime, teen pregnancy, drug abuse, child abuse, welfare, homelessness and a variety of other social ills, we are going to have to address the first three years of life. There is no getting around it. All roads lead to Rome." Rob Reiner, as cited in Bruer (1999, p. 8).

> "If we wait until adolescence to help our children develop the sense of self that is needed to resist the draw of smoking we will be sorry….The research is conclusive. Early investments have a lifelong impact." T. Berry Brazleton, as cited in Bruer (1999, p. 63)

The view that the first three years of life are crucial for subsequent development and gaining a sense of self, has gained support in recent years, owing in part to the influence of two policy documents, the Carnegie Task Force on Meeting the Needs of Young Children report *Starting Points* (1994) and *Rethinking the Brain* (Shore 1997), which was released in conjunction with the April 1997 White House Conference entitled "Early Childhood Development and

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[2] Antecol and Bedard (2002) is another study using this data. They, however, focus on the influence of single parenthood on the likelihood of engaging in risky behavior.

[3] Our analysis is limited to the impact of the number of hours worked. It is beyond the scope of this paper to consider, as Parcel and Menaghan (1994) did, whether the effects differ by the kind of work done by the mother.

Learning: What New Research on the Brain Tells Us About Our Youngest Children" (Bruer, 1999). Though there is controversy over the extent to which neuroscience supports the deterministic view -- expressed in the quotations above by the actor Rob Reiner in his capacity as co-founder of the "I Am Your Child" campaign and foundation and by the prominent pediatrician T. Berry Brazleton -- that after the age of three it is too late to prevent a child from going down the wrong path, it is indisputable that the brain grows rapidly during this period, making it essential that children have the right kind of stimulation in order for the brain to develop normally.

From a different perspective, developmental psychologists stress that advances in the early years lay the groundwork for future development. Thus, if in the first three years, in addition to the brain development just mentioned, the child develops important emotional relationships, attains a basic sense of self and others, and has a variety of learning experiences, it will be more likely that the child will continue on a positive path (Chase-Lansdale, 1998). On the other hand, children whose environments are not conducive to cognitive, social and emotional development will be less ready for school than their peers, thus making it more likely that they will fall further behind and find themselves on a path filled with not only academic but emotional setbacks.

These and related views imply that circumstances that hinder early child development, whether linked to maternal employment or other factors, will have lasting effects. Of course, maternal employment also may yield advantages for children. A perspective referred to as the "human capital" or "financial resources" model emphasizes that the income maternal employment brings in can be invested in the development of the child, whether it is used to improve the physical environment for learning, to ensure the child remains in good health, or to

purchase goods and services that will aid in cognitive stimulation. An alternative perspective highlights the emotional benefits of additional income for parent-child interactions, for example, through reduced levels of stress or a lower likelihood of parental depression (Guo and Harris 2000; Yeung, Linver, and Brooks-Gunn 2001). While more than a decade elapses between toddlerhood and adolescence, recent research suggests that early intervention programs such as Head Start can have long-term effects on outcomes such as being charged or convicted of a crime (Garces, Thomas, and Currie 2002; Currie 2001).

To the potential advantages and disadvantages of maternal employment attendant when a child is very young, a number of others can be added in the case of adolescents. Mothers who work while their children are teens may have less time to provide emotional support, to monitor their children's behavior, and to foster the adolescent's involvement in activities in the school or community (Chase-Lansdale, 1998). Results from the recent synthesis of research on the impact of various welfare experiments by the Manpower Demonstration Research Corporation (Morris *et al.* 2001) underscore the vulnerability of adolescents to changes in their environment. Maternal employment may also hinder the accumulation of social capital of the kind discussed by Coleman (1988). The reduced availability of parents during the day may weaken the social capital inhering in the parent-child relationship, making the children less likely to identify with parental goals and values (Parcel and Menaghan, 1994). Maternal employment may also lead to a loss of social capital in the neighborhood, as parents are less likely to get together and watch each other's children. As a result, the influence of the community on children may diminish, possibly making it more likely that children become involved in antisocial activities (Bianchi 2000). On the positive side, a mother who is working may serve as a better role model for her children, or may find it easier to grant a teenager needed independence.

Of course, whether the impact of maternal employment will be positive or negative will depend in many instances on the family context. Movement into the labor force by a mother will generally affect the parents' relationship with each other, and have spillover effects on the child. For adolescents, not having a stay-at-home parent implies greater responsibility, with some teens benefiting and others not (Lerner and Noh, 2000). The importance of context no doubt explains, in part, the fact that the results of research on the impact of maternal employment on various outcomes for adolescents is mixed (Trzcinski and Brandell, 2002).

II. Empirical Approach

In the empirical work that follows, we estimate models of the form:

$$RB_{ijt} = AVGHRS1_j \alpha_1 + AVGHRS2_j \alpha_2 + X_j \alpha_3 + \varepsilon_{ijt} \tag{1}$$

where the dependent variable RB_{ijt} corresponds to a measure of the ith behavior of the jth adolescent for time period t, $AVGHRS1$ is the average annual number of hours worked by the child mother's in the first three years of life, $AVGHRS2$ is the corresponding variable for the three calendar years preceding time t, X is a vector of regressors, the α's are parameters to be estimated, and e is the disturbance term. In most cases, our dependent variables indicate whether or not an adolescent has engaged in a particular behavior, though we also consider whether or not s/he has surpassed some threshold level of the behavior. If e is drawn from the logistic distribution, equation (1) implies a standard binary logit model. For some of the behaviors, we know not only whether a teen has ever participated in a given risky activity, but also the extent to which the s/he engaged in the activity, usually measured in terms of the number of days over a period that a given behavior has occurred. For these intensity variables, equation (1), with the addition of appropriate cut-off points, implies an ordered logit model.

As mothers who work differ from those who do not, it is clear that estimating equation (1) will not, in general, lead to an estimate of the *causal* impact of hours worked by the mother on the measures of the incidence or intensity of risky behavior. First, mothers who work differ from those who do not on the basis of both observable and unobservable characteristics. Second, the decision to work or stay at home is endogenous; it is apt to be closely tied to complex decisions such as those affecting marital status or spousal labor force participation and may also be influenced by how a child is behaving, rather than or in addition to the reverse (Dunifon and Taylor 2002).

We use three approaches to address the statistical problems that arise. While each approach has limitations, consistency across the methods will enhance confidence in our findings. The first method relies on the estimation of a series of specifications, with each specification including additional variables. While it is not possible to control for all sources of heterogeneity, the pattern of the coefficients and its changes as other covariates are added should be informative.[4] Given the richness of the NLSY79, it is possible to include a wide range of controls for the characteristics of the mother.

Second, we utilize fixed-effects models, taking advantage of the fact that there are both siblings and cousins among the adolescents in the sample. In "mother" fixed-effect models, differences across siblings in outcomes can be related to variations among siblings in hours worked by their mother in their first three years of life and in adolescence. Provided any correlation between maternal employment and the error term is attributable to a mother-specific

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[4] Ruhm (2001) employs a similar approach in assessing the impact of parental employment on child cognitive development. He states that the results will underestimate the negative impact of parental employment on outcomes for the child, asserting that parents who work come from more privileged backgrounds and have characteristics that foster cognitive development. Because children from more advantaged backgrounds may have some characteristics that may make them more likely to engage in risky behavior and for which there are not adequate controls, such as degree of risk aversion or financial means, Ruhm's argument is not tenable here. For instance, Gruber and Zinman

fixed effect, fixed-effect estimates of the coefficients on the hours worked variables will be consistent. A second type of fixed-effects models takes advantage of the fact that some of the mothers in our sample are sisters. If the correlation between the regressors and error term are attributable to a fixed effect common to the mother and her sisters, these "grandparent" fixed-effect models will provide consistent estimates of the impact of maternal employment.

While these models remove the impact of unobserved family heterogeneity that is constant over time, one might reasonably wonder why there are differences across siblings and cousins in maternal employment and whether these differences are related to the dependent variables. The estimates will be biased if, for instance, mothers vary their hours worked in response to a perceived need to provide greater supervision to certain children.

Our third approach relies on instrumental variables. It will provide consistent estimates of the parameters of interest, provided the instruments are correlated with the variables for maternal employment in the first stage but are not related to the dependent variables in the second stage, except via their relationship with maternal employment. We use variation among states and over time in child care regulations, the average wages of child care workers and of all workers, welfare benefit levels, and the status of welfare reform in the state.[5] These variables are likely to influence the mother's decision to work, but seem unlikely to have a direct effect on the behavior of youth, thus meeting the requirement for consistent IV estimation. Yet if the relationship between the instruments and maternal employment is weak, the coefficients on the hours variables will not be estimated precisely or, worse, will be biased and inconsistent (Bound, Jaeger and Baker, 1995).

(2000) find that, increasingly over time, smoking is rising among white suburban youth who have good grades and college-educated parents.

[5] We are grateful to Phil Levine for providing many of these variables, which were used as instruments for maternal employment in Anderson, Butcher and Levine (2002). We updated the wage variables in their dataset by using data

III. Data

A. Dependent Variables

As noted, we use the National Longitudinal Survey of Youth, 1979 (NLSY79), and, in particular, its young adult supplement (NLSY79-YA) to assess the relationship between maternal employment and risky behavior by adolescents. In the NLSY79, the mothers of these young adults have been interviewed since 1979, when they were between 14 and 22 years of age. Beginning in 1986, the children of mothers were assessed and information about the child's health, behavior, and material well-being was collected biennially. A big advantage of these data over those used in many studies of adolescent behavior is that data are available from when the children are quite young.

Starting in 1994, children aged 15 or over were interviewed every other year, and asked about topics including drug, alcohol and cigarette use, sexual activity and crime. Information is collected not only on whether an adolescent engages in a certain kind of behavior, but also on its frequency and the year it began. Our analysis makes use of data on these behaviors for all the years for which it is currently available, 1994, 1996, 1998 and 2000. It should be noted that the young adults in our sample were disproportionately born to young mothers. For instance, for a female respondent of the NLSY79 to have had a child 15 years of age in 1994, she would have had to give birth when she was between the ages of 14 and 22. Even by 2000, a mother of a 15-year old must have given birth when she was between the ages of 20 and 28. The Appendix provides some additional information about the representativeness of the NLSY79-YA and compares its reports of risky behavior with those from national data.

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from the outgoing rotation groups of the CPS and updated the child care regulations using the child care center and family child care licensing studies published by the Children's Foundation.

Table 1 provides descriptive statistics on engagement in these behaviors. Panel A of this table presents the incidence of involvement in risky behaviors both for all person-year observations in the dataset and all person-year observations in estimation.[6] Focusing on the former, we see that, on average over the 1994-2000 period, about three-fifths of these teens have ever drunk alcohol, and about half have smoked cigarettes or engaged in sexual intercourse. Roughly a third of the sample has smoked marijuana, while about 11 percent have used some other illicit drug or been convicted of a crime.[7] Among those sexually active, about three in ten used no form birth control the most recent time they had sex.

When variables are defined such that use must have passed a certain threshold— drinking alcohol at least several times a month, smoking cigarettes every day, and smoking marijuana at least 1 or 2 days per week—the incidence rates fall markedly. Turning to the intensity variables, while about half of the sample has had a drink in the last year, the vast majority has not smoked cigarettes (76 percent) or marijuana (90 percent) over the last 30 days.

B. Hours Variables

While some studies have found that effects of employment in the first year differ from those in the second and third year, statistical tests indicated that it was almost never the case that one could reject the hypothesis that the coefficients for the first three years were the same.[8] As a

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[6] The reason why, for the incidence rates, person-year observations used in estimation are a subset of all person-year observations is as follows: In the multivariate analysis, we are interested in the factors that influence whether a person who has not yet engaged in a particular behavior will engage in that behavior. Thus, in a way analogous to analysis using duration models, observations for each individual are included in the estimation sample until the youth does engage in the behavior (or moves beyond a given threshold). The incidence variable that measures whether the youth used birth control at most recent sex is an exception to this. For birth control use to be measured, the youth must, of course, have had sex. Further, because of the time reference, each observation can be included in the estimation. The same is true for estimation using intensity variables, as behavior may differ from one year to the next. We adjust the standard errors to take into account of the presence of multiple observations per child.

[7] Respondents are asked about the use of substances that are sniffed, cocaine, crack, hallucinogens and sedatives, and these comprise "other drugs".

[8] The studies that have found differential effects for maternal employment have assessed its impact on pre-adolescents. As a result, the focus has been on cognitive development and behavioral problems, not on engagement

result, we took a simple average of hours worked by the mother in the first three years of the child's life. For employment during adolescence, we used the average of the mother's employment during the three calendar years preceding the interview. Here, too, statistical tests were consistent with combining hours variables across different ages during adolescence. We also found that the results differed little between entering each hours variable individually and using them together in a regression.

The first panel of Table 2 presents descriptive statistics on the two hours worked variables and their subcomponents for the 9,395 person-years (accounted for by 2,542 individuals) for which mother's hours of work were available for the first three years of the child's life and for the three calendar years preceding the interview. Not surprisingly, the table shows that mothers worked more when their children were adolescents than when they were infants and toddlers. In the first year of a child's life, more than half the women did not work at all. The average hours worked for a child's first year is 540 hours, or a little more than quarter time. Hours are higher in the second and third years, but even by the third year, both the average and median number of hours worked are still below the number of hours equivalent to half time.

The picture is different when the children are adolescents. Mean hours over the three most recent years are 1,360 hours, or a little under 70 percent time. Median hours are some what higher, exceeding three quarters time.[9]

As noted, women who work differ in some ways from those who do not. As Table 2b shows, those who are not employed have lower levels of characteristics thought by some to be associated with better parenting – AFQT scores and education level (Ruhm 2001). On average,

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in risky behavior. Examples include Blau and Grossberg (1992), Ruhm (2001), and Waldfogel, Han and Brooks-Gunn (2002).

[9] The gap between hours worked when the children are young and when they are in adolescence may be smaller for later cohorts. Olivetti (2001) finds a secular increase in the amount of hours worked by mothers with young

women who are not employed have about one fewer years of schooling and an AFQT score that is 12 points lower than those employed, relationships that hold both for early maternal employment and employment during adolescence. Despite these differences, the standard deviations are high enough that one cannot reject the hypothesis that these variables are equal across the two groups.

IV. Multivariate Analysis

A. Logit Estimates

1. Main Results

Table 3 summarizes the results from our first approach to estimating the impact of maternal employment on the incidence of risky behavior. Three different specifications are used. In the first, only the hours variables are included as regressors. In the second, we add controls for the age and sex of the child, and also include variables that are outside of the mother's control and thus can be considered exogenous. These variables include measures of the location of the mother's birth, whether she lived in an SMSA, the household structure of her family when she was age 14, the highest grade attended by her parents, whether she had newspapers or magazines in her home or held a library card at age 14, her religious affiliation and attendance in 1979, and whether her mother worked at age 14. These variables may be correlated with factors that will affect the adolescent's susceptibility to engaging in the risky behaviors, including child endowments (passed on either genetically or environmentally), attitudes towards the behaviors of interest, and parenting style, among many others.

In this second specification, we are careful not to include variables that may be endogenous. Doing so would mean that the equation would no longer be a reduced form, leading

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children, one that she attributes to its becoming more costly for mothers with young children to cut back on their hours, given that the return to experience for women has risen relative to that for men.

to simultaneity bias. In addition, one runs the risk of holding constant variables that may be determined simultaneously with or in response to hours worked, making it difficult to interpret the coefficients. For instance, marital status and number of children, not to mention the hours worked by a spouse are examples of variables that may be chosen jointly with the hours worked by the mother (Killingsworth 1983; van der Klaauw, 1996; Francesconi 2002).[10] Because many previous studies of the effects of maternal employment on children include controls for mother's human capital, household structure and composition, and family resources, we employ a third specification that includes such controls, allowing us to assess whether the additional variables influence the results. For instance, if the impacts of employment are coming through the additional financial resources flowing in, the inclusion of the income variable should absorb these effects. The additional controls include the mother's age at the birth of the child, her highest grade completed, marital status, score on the Armed Forces Qualifying Test, the number of female and male adults in the household, the number and ages of the children in the household, birth order, and family income.

Table 3 summarizes the results from logit regressions for the incidence measures, both those measuring whether the respondent has ever engaged in a particular behavior, and those measuring whether a threshold level of activity has been surpassed. Instead of coefficient estimates, we report the marginal effect of increasing hours worked by 1000 on the probability that those who have not already engaged in a particular behavior (or surpassed a threshold level) will do so. An increase of 1,000 in hours worked corresponds roughly to the change in hours that results from moving from not working at all to being half time through the year, or moving from half time to full time.

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[10] See Blau (1999) for a similar approach.

The evidence in Table 3 seems to imply that higher hours of maternal employment in the early years of a child's life do not make it more likely that s/he will engage in risky behaviors. In more than half the cases, the sign of the coefficient for hours worked in the first three years is negative, consistent with *reduced* participation in risky behaviors. It is, however, rare for these negative coefficients to be statistically significant, though it occurs in two out of three specifications for ever having had sexual intercourse. Out of the 30 regressions summarized in Table 3, there is only one instance where there is a positive and statistically significant association between maternal employment in the first three years and participation in risky behaviors, the third specification for ever having been convicted of a crime.

As with maternal employment in the first years, there is little evidence to suggest that greater hours of maternal employment during adolescence increases the riskiness of adolescent behavior. In fact, there are no cases where there is a significant positive association between risky behaviors and maternal employment during adolescence. For the first two specifications, women who work more are less likely to have children who have committed a crime or engaged in unsafe sex, but these results are not robust to the inclusion of additional variables in the third specification.

We now turn to an analysis of the relationship between maternal employment and the *intensity* of the risky behaviors, making use of ordered logits. In the results that are summarized in Table 4, we report both the coefficients for the hours variables, as well as the estimates' implied impact on the dependent variable. As with the incidence results, there is little evidence of an association between maternal employment during the first three years and risky behavior. Out of a total of nine regressions summarized in Table 4, there is only one case where this relationship is significant, with the coefficient suggesting reduced alcohol use. For hours worked

during adolescence, we see for the first time a significant relationship for all three specifications, suggesting that maternal employment is associated with a greater number of days alcohol is used; a 1,000 hours change in the time worked implies an increase of 1-2 days of alcohol use over the past year. We see no evidence that hours worked – both when the child is young and during adolescence—are related to the intensity of cigarette or marijuana use.

2. Sensitivity Analysis

In this subsection, we examine whether our results differ by sex, race/ethnicity and marital status. It is clear that the relationship between risky behaviors and maternal employment, both early on and in adolescence, may differ by the sex of the child.[11] If, for example, boys are more vulnerable than girls to the absence of their mothers, they are more likely to be harmed when their mothers work (Han, Waldfogel, and Brooks-Gunn 2001). More generally, given that for both genetic and environmental reasons boys will respond differently than girls to their mother's behavior and vice versa, the impact of a mother's decision to work may differ by sex. To see if this is the case, we ran the regressions of Tables 3 and 4 separately by the sex of child, making use of the second specification. The results, presented in Tables 5 and 6, do not differ substantially by sex, with a few exceptions. Perhaps of greatest interest are the results for the intensity of alcohol use, as this dependent variable was the only one where a statistically significant relationship was robust to changes in specification. Both males and females whose mothers worked more than average during adolescence drank alcohol more frequently in the last 12 months than their counterparts, though the coefficient is only significant for females. On the other hand, more hours of early maternal employment is associated with a reduction in the likelihood of drinking alcohol several times a month for males but not females. Increased work

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[11] For examples of studies where the impact of maternal employment differed by the sex of the child, see Desai, Chase-Lansdale and Michael (1989) and Bogenschneider and Steinberg (1994) and the references therein.

effort in a child's early years is associated with a reduction in the likelihood of having had sexual intercourse among males, but not among females. It is also apparent that the association of employment during adolescence with a reduction in the likelihood of being convicted of a crime is driven by results among male teens, perhaps not surprisingly given that 18% of the males versus 7% of the females in this sample have been convicted of a crime.[12] Males (but not females) whose mothers worked while they were young had a higher likelihood of not using birth control, while employment during adolescence is associated with a greater likelihood of using birth control only for females.

In general, there are apt to be differences in the relationships under study by race and ethnicity.[13] These may arise because of racial or ethnic differences in the quality of child care arrangements that are available to working mothers, if only because of the variation in income across racial and ethnic groups (NICHD Child Care Network, 1999). In later years, the quality of after-school activities that are available to young adults whose mothers work may also vary by race and ethnicity. Table 7 and 8 summarize the results for regressions run separately for African Americans, Hispanics and whites. As with the regressions by sex, the results by race/ethnicity[14] show no evidence of a relationship in the vast majority of cases, though it is of interest to see which groups are driving the results. The association between alcohol use and maternal employment adolescence seems to be concentrated among whites; for this race, an increase in hours worked by 1,000 is associated with a 4 percent higher chance of trying alcohol

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[12] In this sample, the conviction rate by gender is more similar than statistics on juvenile crime would indicate. For instance, in 1998 76% of youths tried in juvenile court were male and in 1997 and in 1999 about 86% of the youths in custody were male (Stahl, 2001; Sickmund and Wan, 2001).

[13] For example, Han, Waldfogel and Brooks-Gunn (2001) and Waldfogel, Han, and Brooks-Gunn (2002) find differences by race/ethnicity in the effects of early maternal employment on child cognitive development, while Anderson, Butcher and Levine (2002) find differences by race in the impact of maternal employment on a child's being overweight.

[14] The sample was divided into three groups: Hispanics, African Americans, and those neither Hispanic nor African American.

and an increase of 1.7 days in the days used alcohol in the last year. The negative association seen in Table 3 between early maternal employment and ever having had sexual intercourse seems to be driven mainly by the relationship among African Americans. Somewhat perversely, among African Americans higher work effort during adolescence is associated with an increased likelihood of using birth control, while for Hispanics the opposite is true. Among African Americans, there is a reduced likelihood of smoking in the last 30 days that is associated with greater work effort during adolescence.

As a final sensitivity test, we examine the results of the second specification by marital status.[15] Though marital status may be endogenous, consideration separately by marital status is clearly of interest. When single parents work, there is no other parent to shoulder the burden of child care and a lack of resources may constrain the choice of child care arrangements. The improvements in economic well-being and reduced stress levels, however, may be greater from a single mother's employment than from a married mother's employment. Thus, *a priori*, it is difficult to say whether or not hours worked by a single mother are likely to be more harmful for a child than if a married mother worked. With one exception, the relationship between hours worked by single parents in a child's first three years and risky behavior was not significant. Conducting the analysis separately by marital status uncovered some cases where hours worked during adolescence by a married parent was associated with a greater extent of risky behavior: ever having had a drink of alcohol, ever having had sexual intercourse and the number of days of alcohol use. In contrast, hours worked by a single mother during adolescence are associated with a decrease in some risky behaviors: ever having been convicted of a crime and using marijuana

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[15] Given that a woman may be married in one period but not the other, it is not possible to split the sample by marital status. Instead for both early and adolescent maternal employment, marital status was interacted with the hours variables. For each of the two time periods, two marital status variables are defined. The first equals 1 if the youth's mother was married at the three relevant interviews and no marital changes occurred between interviews and

at least one or two days per week. Maternal hours worked during adolescence is associated with increased probability of using birth control as last sex regardless of mother's marital status—as was the case when this relationship was examined jointly across mother's marital status.

B. Fixed-Effect Estimates

As noted above, we estimate two types of fixed-effect models, both using the conditional logit approach of Chamberlain (1980). In the first, all siblings observed during adolescence are assumed to have the same fixed effect, so differences across siblings in outcomes are regressed against differences across siblings in hours their mother worked and other variables that vary by sibling. The other model type, "grandmother" fixed effects, assumes a constant factor across anyone with a maternal grandparent in common. Thus, the differences across cousins in outcomes will be related to variation across their mothers in the amount of time worked when their children are under the age of three and in adolescence. For both types of fixed-effects models, we use the second specification of Tables 3[16], which adds to the hours variables characteristics that are almost certainly exogenous.[17] We used Hausman tests to compare the estimates from the conditional logit fixed effects models to those from the standard logit models. The hypothesis that there are no systematic differences in the coefficient estimates can be rejected for six of the ten binary dependent variables for the "mother" fixed effects and in eight of ten instances for the "grandmother" fixed effects, while in two instances the asymptotic conditions required for a valid Hausman test are not met.

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the second equals one if she was not married at any of these interviews or experienced a marital transition in the interim.

[16] We do not re-estimate the models of Table 4 using fixed-effects, because of the difficulty of doing fixed effects with ordered logits. We did, however, experiment with changing the threshold and running binary logit fixed-effects models; the results were consistent with those reported in Table 11.

[17] In the "mother" fixed effect models, the child's age and gender, and the year indicators are the only regressors besides mother's hours worked that differ across siblings. In the "grandparent" fixed effect models, all control variables except those for race and ethnicity can, in theory, differ across cousins.

The first eight columns of Table 11 summarize the results of the fixed effect models for the incidence variables. In order to be included in the likelihood function for conditional fixed-effect models, it must be the case that there is variation across the individuals with a factor in common. For the "mother" fixed effects, therefore, one sibling must have engaged in a behavior or surpassed a threshold at one point in time, while the other(s) did not, or vice versa. For the "grandmother" effects, similarly, there must be variation across the cousins in the dependent variable. This requirement means that the sample sizes are smaller for the conditional logit fixed effects than they are for their standard binary-logit counterparts.[18]

The fixed-effects results in Table 11 are consistent with those in Table 3 in the sense that it is rare for the coefficients on the hours worked variables to be statistically significant. There are no cases where employment during adolescence has a significant relationship with the incidence variables. For employment in the first three years of the child's life, the only statistically significant relationship that is consistent between the two types of fixed effects is that for whether birth control has been used the last time the individual had sex; early childhood employment is associated with an increase of about eleven percentage points in the likelihood of using birth control. For the "mother" fixed effects, more hours of maternal employment in the first three years of the adolescent's life is associated with a greater likelihood of ever having had an alcoholic drink.

C. Instrumental Variables Estimates

For our instrumental variable estimation, as with the fixed effects models, we again make use of the second specification. We focus on the incidence and threshold dependent variables, and, for ease of implementation, we use linear probability models in the IV estimation.

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[18] We compared the results of the conditional fixed-effect logit models to those from linear probability models with fixed effects and found little difference.

We first test to see if it is necessary to use instrumental variables -- that is, whether OLS estimates are, indeed, inconsistent -- employing a test suggested by Davidson and MacKinnon (1993). Somewhat surprisingly, there are a number of cases where we cannot reject the consistency of OLS, four out of the 10 dependent variables for maternal employment in the first three years of the child's life and six of ten in the case of maternal employment in the three most recent years. But, as the power of exogeneity tests have been called in question, we present IV estimates for all dependent variables.

The instruments we use can be divided into three groups. The first are regulations that apply to child care centers: the maximum ratios of children to staff for ages 0-5 and whether liability insurance is required. The second is the same set of variables, but applying to family child care. Both sets of child care variables are likely to influence whether the mother can find child care that is at a low enough cost and high enough quality; a failure to find child care that meets these standards makes it less probable that a mother will work (Hotz and Kilburn, 1996; Baum 2002). The third set of instruments includes welfare benefit levels, the status of welfare reform in the state, and the mean hourly wage for all workers and for child care workers. These variables influence the financial cost and benefits of the decision to work.[19]

Recent research has highlighted the problems that may arise—inconsistency and finite-sample bias—if there is not a strong relationship between the instruments and the hours variables that we are treating as endogenous in the IV estimation (Bound, Jaeger and Baker 1995). These problems can be exacerbated by having a large number of instruments, which in our case number around 40. Diagnostics suggested to examine if weak instruments may be a problem are: 1) calculating the R-squared of a regression of the endogenous regressors--the two hours of work

variables—on the instruments, after the exogenous variables that appear in both the first and second-stage equations have been partialed out and 2) calculating the F-statistics of the excluded instruments in the first stage equations, for each of our endogenous regressors. Though there is some variation across dependent variables because of differences in sample, the partial R-squared for the first-stage equation for the variable measuring hours worked early in the child's life is generally in the neighborhood of 0.03-0.4, while the F-statistic is usually between 3.0 and 4.0. For the variable measuring hours worked during adolescence, the partial R-squareds are also around 0.03-0.04, and the F-statistics are generally between 2.0 and 3.0.

The partial R-squared and F-statistics are low enough to suggest that IV estimation is potentially problematic. According to a table in Bound, Baker and Jaeger (1995), the F-statistic combined with the number of instruments suggest that the bias of IV estimates relative to OLS estimates is about 20-30 percent. One approach to addressing this bias would be to calculate standard errors that take this bias into account, such as in Staiger and Stock (1997). We did not follow this approach, because, as will be evident below, it is rare for the coefficients on the endogenous regressors to be significant; it is likely that calculating standard errors taking account of the finite sample bias would only make this even more rare.

Our IV models are overidentified so it is possible to test whether the overidentifying restrictions – the exclusion of the instruments from the second stage equation – can be rejected, which would cast doubt on the validity of the instruments. We conducted tests both on all instruments as well as on groups of instruments (Hayashi 2000). For the test on all instruments, we used Sargan's statistic and found-- somewhat surprisingly, given the weak relationship between the instruments and the endogenous regressors – that the validity of the instruments was

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[19] To make use of these instruments, we match to the respondent the instruments for the appropriate state in the six years for which the maternal employment hours are taken. To correspond to how we measure hours of maternal

rejected in half the cases.[20] We then calculated a C statistic for each of our six groups of instruments (three sets x two time periods) for each dependent variable, to indicate whether the group of instruments can be considered exogenous. We then excluded any group of instruments for which exogeneity is rejected from the instruments. Doing so greatly reduced the number of cases for which the validity of *all* instruments used was rejected. We, however, found virtually no difference in the results when these groups of instruments were excluded, so we report results from regressions where all the instruments were used.

These results are presented in the last two columns of Table 11. There are no cases where there is a significant relationship between hours worked during adolescence and the likelihood of engaging in or surpassing a threshold for any of the risky behaviors. For the maternal employment hours variable for first three years, there is one significant relationship, which suggests that early maternal employment reduces the likelihood of ever having smoked by about 20 percent.

V. Conclusions

Taking our three approaches as a whole, we find very little evidence consistent with the view that what happens in the first three years of a child's life can have lasting effects on the child's development, at least in terms of whether maternal employment affects the likelihood of engaging in the risky behaviors. Reasons for this (non) finding can be placed in two categories. The first is that there is enough time between the age of three and adolescence to undo any harm that may have come about from maternal employment in the child's first years. Future research might usefully explore whether behavioral problems at a young age are a good predictor of problems as an adolescent.

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employment, we then calculate the averages for each instrument, one for each three-year period.

The second category includes reasons why the assumption that maternal employment greatly reduces the time that parents spend with their children may not have a firm empirical basis. Consistent with this view is the finding by Sandberg and Hofferth (2001) that children spent no less time with their parents in 1997 than in 1981. Bianchi (2000) offers several reasons why the increase in labor force participation by mothers has not led to large changes in the amount of time children spend with their parents. First, the time that non-working mothers can devote to children is diminished by the amount of time spent on other household activities such as cleaning and cooking. Working mothers may be able reduce time spent on these activities by hiring a cleaning service, or relying more on take-out or frozen dinners. Second, working mothers, particularly those with flexible work schedules, may be able to ensure that their paid work does not substantially reduce the time with their children. Third, both the fact that families are smaller and that preschool age children now spend more time in school-like settings reduces the time demand on mothers, independent of their work status. Finally, in many cases, the involvement of men in child rearing may have increased to offset reduced time by women.

With the possible exception of drinking alcohol, our results do not indicate that maternal employment during adolescence is correlated with increased involvement in risky activities. Many of the reasons that could explain why parental time with children may not be reduced substantially when mothers work apply here as well. In addition, the positive effects of working – such as serving as a positive role model or allowing teens needed independence -- may serve to offset the harmful effects.

It is clear, moreover, that there are many other influences on the behavior of young adults. Within the family, the amount of time a mother works is just one factor affecting her

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[20] Our instruments vary only by state and year. Hoxby and Paserman (1997) show that when this kind of grouped data is used that overidentifying restrictions are rejected too frequently.

relationship with her children. Other aspects of family background – for example, the level of income and its components, the adolescent's relationship with the other parent, birth order and the presence on more siblings in general -- are also likely to play a role. Outside the family, peers, the neighborhood and community in which the adolescent lives, and the school s/he attends all are likely to have important impacts (Peters and Mullis, 1997; Brooks-Gunn, Duncan and Aber 1997; Duncan, Boisjoly and Harris 2001; Kooreman and Soetevent 2002; Mocan, Scafidi and Tekin 2002; Argys, *et. al.*, 2002).

References

Anderson, Patricia M., Kristin F. Butcher, and Phillip B. Levine. 2002. "Maternal Employment and Overweight Children." NBER Working Paper No. 8770, February.

Antecol, Heather and Kelly Bedard. 2002. "Does Single Parenthood Increase the Probability of Teenage Promiscuity, Drug Use and Crime? Evidence from Divorce Law Changes." Claremont Colleges Working Papers, 2002-23.

Argys, Laura M., Susan L. Averett, Daniel I. Rees, and Benjama Witoonchart. 2002. Do Older Peers Affect Adolescent Behavior? An Analysis of Birth-Order Effects in the NLSY97. Unpublished, University of Colorado-Denver.

Baum II, Charles. 2002. "A Dynamic Analysis of the Effect of Child Care Costs on the Work Decisions of Low-Income Mothers." *Demography*, Vol. 39, No. 1, February, pp. 2002.

Bianchi, Suzanne M. 2000. "Maternal Employment and Time With Children: Dramatic Change or Surprising Continuity?" *Demography*, Vol. 37, No. 4, November, pp. 401-414.

Blau, David M. 1999. "The Effect of Income on Child Development." *Review of Economics and Statistics* 81(2):261-276.

Blau, Francine D. and Adam J. Grossberg. 1992. "Maternal Labor Supply and Children's Cognitive Development." *Review of Economics and Statistics*, Vol. 74, No. 3, pp. 474-481.

Bogenschneider, Karen and Laurence Steinberg. 1994. "Maternal Employment and Adolescents' Academic Achievement: A Developmental Analysis." *Sociology of Education*, Vol. 67 (January), pp. 60-77.

Bound, John, David A. Jaeger and Regina M. Baker. 1995. "Problems with Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous Explanatory Variables Is Weak." *Journal of the American Statistical Association*, Vol. 95, No. 430, June, pp. 443-450.

Brooks-Gunn, Greg J. Duncan and J. Lawrence Aber. 1997. *Neighborhood Poverty: Context and Consequences for Children*. New York: Russell Sage Foundation.

Bruer, John T. 1999. *The Myth of the First Three Years: A New Understanding of Early Brain Development and Lifelong Learning*. New York: The Free Press.

Carnegie Task Force on Meeting the Needs of Young Children. 1994. *Starting Points.* New York: Carnegie Corporation of New York.

Chamberlain, Gary. 1980. "Analysis of Covariance with Qualitative Data." *Review of Economic Studies*, Vol. 47, No. 2, pp. 225-238.

Chase-Lansdale, P. Lindsay. 1998. "How Developmental Psychologists Think About Family Process and Child Development in Low Income Families." Paper prepared for the pre-conference, "Family Process and Child Development in Low Income Families," Joint Center for Poverty Research, Chicago, IL, May, 7, 1998.

Coleman, J. S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* Vol. 94, pp.: S95-120.

Currie, Janet. 2001. "Early Childhood Education Programs." *Journal of Economic Perspectives*, Vol. 15, No. 2, Spring, pp. 213-238.

Davidson, Russell and James G. MacKinnon. 1993. *Estimation and Inference in Econometrics*. New York: Oxford University Press.

Desai, Sonalde, P. Lindsay Chase-Lansdale, and Robert T. Michael. 1989. "Mother or Market? Effects of Maternal Employment on the Intellectual Ability of 4-Year-Old Children." *Demography*, Vol. 26, No. 4, November, pp. 545-561.

Duncan, Greg J., Johanne Boisjoly, and Kathleen Mullan Harris. 2001. "Sibling, Peer, Neighbor and Schoolmate Correlations. *Demography*, Vol. 38, Number 3, pp. 437-447.

Dunifon, Rachel and Catherine J. Taylor. 2002. "Is Maternal Work Behavior Affected by Children's Health and Behavior Problems. Unpublished, Cornell University, Department of Policy Analysis and Management.

Figlio, David and Jens Ludwig. 2000. "Sex, Drugs and Catholic Schools: Private Schooling and Non-Market Adolescent Behaviors." NBER Working Paper No. 7990, November.

Francesconi, Marco. 2002. "A Joint Dynamic Model of Fertility and Work of Married Women." *Journal of Labor Economics*, Vol. 20, Num. 2, Part 1, pp. 336-380.

Garces, Eliana, Duncan Thomas, Janet Currie. 2002. "Longer Term Effects of Head Start." *American Economic Review*, Vol. 92, Num. 4, pp. 999-1012.

Greene, William H. 1997. *Econometric Analysis, 3rd Edition*. Upper Saddle River, New Jersey: Prentice-Hall, Inc.

Gruber, Jonathan. 2000. "Risky Behavior among Youths: An Economic Analysis." NBER Working Paper No. w7781, July.

Gruber, Jonathan and Jonathan Zinman. 2000. "Youth Smoking in the U.S.: Evidence and Implications." NBER Working Paper No. 7780, July.

Guo, Guang and Kathleen Mullan Harris. 2000. "The Mechanisms Mediating the Effects of Poverty on Children's Intellectual Development." *Demography* 37(4):431-447.

Han, Wen-Jui, Jane Waldfogel and Jeanne Brooks-Gunn. 2001. "The Effects of Early Maternal Employment on Later Cognitive and Behavioral Outcomes." *Journal of Marriage and Family* 63, February, pp. 336-354.

Harvey, Elizabeth. 1999. "Short-Term and Long-Term Effects of Early Parental Employment on Children of the National Longitudinal Survey of Youth." *Developmental Psychology*, Vol. 35, No. 2, March, pp. 445-459.

Hayashi, Fumio. 2000. *Econometrics*. Princeton: Princeton University Press.

Hoxby, Caroline and M. Daniele Paserman. 1998. "Overidentification Tests with grouped Data." NBER Technical Working Paper No. 223, February.

Killingsworth, Mark R. 1983. *Labor Supply*. Cambridge: Cambridge University Press.

Kooreman, Peter and Adriaan Soetevent. 2002. "A Discrete Choice Model with Social Interactions: An Analysis of High School Teen Behavior." Unpublished, University of Groningen.

Lerner, Jacqueline V. and E. Ree Noh. 2000. "Maternal Employment Influences on Early Adolescent Development: A Contextual View." In R. Taylor and Wang, eds., *Resilience Across Contexts: Family, Work, Culture and Community*, Mahwah, NJ: Lawrence Erlbaum Associates.

Mocan, H. Naci, Benjamin Scafidi, and Erdal Tekin. 2002. "Catholic Schools and Bad Behavior." IZA Discussion Paper No. 599, October.

Morris, Pamela A., Aletha C. Huston, Greg J. Duncan, Danielle A. Crosby, and Johannes M. Bos. *How Welfare and Work Policies Affect Children: A Synthesis of Research*. New York: Manpower Demonstration Research Corporation.

NICHD Child Care Research Network. 1997. "Poverty and Patterns of Child Care." In Greg J. Duncan and Jeanne Brooks-Gunn, eds., *Consequences of Growing Up Poor*, New York: Russell Sage Foundation.

Olivetti, Claudia. 2001. "Changes in Women's Hours of Market Work: The Effect of Changing Returns to Experience." Unpublished, Boston University.

Parcel, Toby L. and Elizabeth G. Menaghan. 1994. "Early Parental Work, Family Social Capital, and Early Childhood Outcomes." *American Journal of Sociology*, Vol. 99, No. 4, January, pp.: 972-1009.

Pergamit, Michael R., Lynn Huang and Julie Lane. 2001. "The Long Term Impact of Adolescent Risky Behaviors and Family Environment." Report submitted to Office of

the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Peters, H. Elizabeth and Natalie C. Mullis. 1997. "The Role of Family Income and Sources of Income in Adolescent Achievement." In Greg Duncan and Jeanne Brooks-Gun, eds., "The Consequences of Growing Up Poor." New York: Russell Sage Foundation.

Ruhm, Christopher J. 2001. "Parental Employment and Child Cognitive Development." Unpublished, University of North Carolina at Greensboro, March.

Sandberg, John F. and Sandra L. Hofferth. 2001. "Changes in Children's Time With Parents: United States, 1981-1997." *Demography* Vol. 38, No. 3, August, pp. 423-436.

Shore, Rima. 1997. *Rethinking the Brain: New Insights into Early Development*. New York: Families and Work Institute.

Sickmund, Melissa and Yi-chun Wan. 2001. "Census of Juveniles in Residential Placement Databook." Online Available: http://www.ojjdp.ncjrs.org/ojstatbb/cjrp.

Stahl, Anne L. 2001. "Delinquency Cases in Juvenile Courts, 1998." Online Available: http://www.ncjrs.org/txtfiles1/ojjdp/fs200131.txt

Staiger, Douglas and James H. Stock. 1997. "Instrumental Variables Regression with Weak Instruments." *Econometrica*, Vol. 65, No. 3, May, pp. 557-586.

Trzcinski, Eileen and Jerry Brandell. 2002. "Adolescent Outcomes, Poverty Status and Welfare Reform: An Analysis Based on the Survey of Program Dynamics." Joint Center for Poverty Research Working Paper No. 269, January.

U.S. Department of Health and Human Services. 2001. *Trends in the Well-Being of America's Children and Youth.*

van der Klaauw, Wilbert. 1996. "Female Labor Supply and Marital Status Decisions: A Life-Cycle Model." *Review of Economic Studies*. Vol. 63, no. 2, April, pp. 199-235.

Waldfogel, Jane, Wen-Jui Han, and Jeanne Brooks-Gunn. 2002. "The Effects of Early Maternal Employment on Child Cognitive Development." *Demography*, Vol. 39, No. 2, May, pp. 369-392.

Yeung, Wei-jun Jean, Miriam R. Linver, and Jeanne Brooks-Gunn. 2001. "How Money Matters for Young Children's Development: Human Capital and Family Processes." Mimeo, New York University.

Table 1: Youth Involvement in Risky Behaviors

Table 1a: Incidence of Involvement in Risky Behaviors

	All Observations		Observations Used in Estimation	
	Person-Year Observations	% Participated in Behavior	Person-Year Observations	% Participated in Behavior
Ever:				
Drank Alcohol	4553	62.29	3141	50.11
Smoked Cigarette	4386	48.97	3254	33.31
Used Marijuana	4576	34.16	3828	22.99
Used Other Drugs	4510	10.75	4302	7.44
Had Sexual Intercourse	4603	52.12	3460	37.37
Convicted of Crime	4678	11.44	4436	6.61
Use Above Threshold:				
Drank Alcohol at least Several Times a Month	4517	13.62	4052	11.38
Smoked Cigarettes Everyday	4610	14.23	4240	10.38
Used Marijuana at least 1 to 2 Days per Week	4444	6.14	4256	5.08
Used No Form of Birth Control at Most Recent Sex	2399	29.80	2399	29.80

Table 1b: Intensity of Involvement in Risky Behaviors

	Person-Year Observations	% Participated in Behavior
Intensity of Use:		
Alcohol Use during Last 12 Months (n=4370)		
None	2195	50.23
1 to 2 days in Past 12 Months	562	12.86
3 to 5 days in Past 12 Months	297	6.80
Every Other Month or So	285	6.52
1 to 2 Times per Month	415	9.50
Several Times a Month	236	5.40
1 to 2 Days per Week	276	6.32
Almost Daily, 3-6 Days per Week	66	1.51
Daily	38	0.87
Cigarette Use in Last 30 Days (n=4546)		
None	3459	76.09
Less than once per week	200	4.40
1 or 2 days per week	110	2.42
3 or 4 days per week	74	1.63
5 or 6 days per week	47	1.03
Every day	656	14.43
Marijuana Use in Last 30 Days (n=4384)		
None	3942	89.92
Less than once per week	169	3.85
1 or 2 days per week	98	2.24
3 or 4 days per week	56	1.28
5 or 6 days per week	35	0.80
Every day	84	1.92

Table 2

Maternal Annual Hours of Employment and Characteristics by Employment Status

Table 2a: Statistics on Maternal Annual Hours of Employment

Year	Mean	Median	10th percentile	90th percentile
1st year of Child's Life	539.65	0	0	1812
2nd year of Child's Life	823.88	560	0	2080
3rd year of Child's Life	977.37	900	0	2080
Average over 1st 3 Years	780.30	622.22	0	1920
3 Years Ago	1291.03	1728	0	2340
2 Years Ago	1394.03	1720	0	2420
1 Year Ago	1393.65	1520	0	2405
Average over Last 3 Years	1359.82	1560	8	2337.33

Note: Sample size is 2542 individuals with 9395 person-years.

Table 2b: Means of Characteristics by Employment Status

	Child's First Three Years		Last Three Recent Years	
	Nonemployed	Employed	Nonemployed	Employed
Highest Grade Attended	11.53	12.49	11.25	12.37
	(2.32)	(1.91)	(2.43)	(1.98)
AFQT score	21.24	33.65	19.72	31.72
	(22.08)	(24.34)	(31.72)	(24.31)

Note: Standard deviation in parentheses

Table 3

Marginal Effect of Hours Worked by Mother on Incidence of Risky Behaviors, Logit Estimates

Specification	Maternal Employment only		Maternal Employment and Core Regressors		Maternal Employment, Core, and Additional Regressors	
	Ave. annual hours, First 3 yrs.	Ave. annual hours, Last 3 yrs.	Ave. annual hours, First 3 yrs.	Ave. annual hours, Last 3 yrs.	Ave. annual hours, First 3 yrs.	Ave. annual hours, Last 3 yrs.
Ever:						
Drank Alcohol (n=3141)	-0.016	0.020	-0.010	0.022	-0.013	0.021
	(0.013)	(0.011)	(0.014)	(0.012)	(0.015)	(0.012)
Smoked Cigarettes (n=3254)	-0.017	0.002	-0.024	0.009	-0.016	0.008
	(0.013)	(0.010)	(0.013)	(0.010)	(0.014)	(0.011)
Used Marijuana (n=3828)	-0.018	0.000	-0.017	-0.001	-0.011	0.004
	(0.010)	(0.008)	(0.010)	(0.008)	(0.011)	(0.009)
Used Other drugs (n=4302)	0.004	0.001	-0.010	0.000	-0.001	-0.013
	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)
Had Sexual Intercourse	-0.054**	0.010	-0.041**	0.003	-0.026	0.011
(n=3460)	(0.011)	(0.009)	(0.013)	(0.011)	(0.014)	(0.011)
Convicted of crime (n=4436)	-0.001	-0.013**	0.001	-0.013**	0.009*	-0.006
	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Use Above Threshold:						
Drink Alcohol at least	-0.015**	0.006	-0.010	0.001	0.011	0.001
Once a month (n=4052)	(0.007)	(0.006)	(0.007)	(0.005)	(0.007)	(0.005)
Smoked Cigarettes Everyday	-0.004	-0.003	-0.004	-0.005	0.003	-0.001
(n=4240)	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)
Used marijuana at least 1 to 2	-0.006	-0.005	-0.005	-0.004	-0.002	-0.003
Days per week (n=4256)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)
Used No form of birth control	-0.023	-0.036**	-0.022	-0.033**	-0.003	-0.018
at most recent Sex (n=2399)	(0.015)	(0.011)	(0.015)	(0.011)	(0.016)	(0.012)

Note: Sample sizes are based on person-year observations. Standard errors are presented in parentheses. * indicates coefficient is significant at .05-level, ** at .01-level. Hours variables are measured in units of 1,000.

Table 4

Coefficient Estimates of Hours Worked by Mother on Intensity of Risky Behaviors, Ordered Logit Estimates

Specification	Maternal Employment only		Maternal Employment and Core Regressors		Maternal Employment, Core, and Additional Regressors	
	Ave. annual hours, First 3 yrs.	Ave. annual hours, Last 3 yrs.	Ave. annual hours, First 3 yrs.	Ave. annual hours, Last 3 yrs.	Ave. annual hours, First 3 yrs.	Ave. annual hours, Last 3 yrs.
Alcohol Use in Last 12	-0.074*	0.160**	-0.039	0.107**	-0.041	0.092*
Months (n=4370)	(0.050)	(0.040)	(0.053)	(0.042)	(0.055)	(0.044)
Change in Mean # of Days	-1.011	2.169	-0.501	1.344	-0.517	1.118
Cigarette Use in Last 30 Days	-0.032	-0.025	-0.027	-0.083	0.021	-0.072
(n=4546)	(0.066)	(0.051)	(0.073)	(0.053)	(0.076)	(0.056)
Change in Mean # of Days	-0.132	-0.106	-0.106	-0.324	0.080	-0.279
Marijuana Use in the Last 30	-0.120	-0.079	-0.107	-0.100	-0.069	-0.083
Days (n=4384)	(0.086)	(0.070)	(0.093)	(0.070)	(0.097)	(0.073)
Change in Mean # of Days	-0.131	-0.088	-0.103	-0.098	-0.069	-0.085

Note: Sample sizes are based on person-year observations. Standard errors are presented in parentheses. Changes in mean number of days on which the activity is undertaken are presented in square brackets. * indicates coefficient is significant at .05-level, ** at .01-level. Hours variables are measured in units of 1,000.

Table 5

**Effect of Average Annual Hours Worked by Mother on Incidence of Risky Behaviors
By Sex**

	Ave. annual hours, First 3 yrs.		Ave. annual hours, Last 3 yrs.	
	Male	Female	Male	Female
Ever:				
Drank Alcohol	-0.007	-0.013	0.028	0.022
	(0.021)	(0.020)	(0.017)	(0.016)
	[1544]	[1597]		
Smoked Cigarettes	-0.033	-0.015	0.009	0.013
	(0.019)	(0.019)	(0.015)	(0.015)
	[1591]	[1663]		
Used Marijuana	-0.015	-0.020	0.0046	-0.004
	(0.015)	(0.014)	(0.0121)	(0.011)
	[1869]	[1959]		
Used Other drugs	0.008	-0.007	-0.003	0.002
	(0.006)	(0.007)	(0.005)	(0.005)
	[2106]	[2196]		
Had Sexual Intercourse	-0.048**	-0.034	0.012	-0.003
	(0.018)	(0.019)	(0.016)	(0.015)
	[1710]	[1750]		
Convicted of crime	-0.000	0.003	-0.023**	-0.005
	(0.009)	(0.005)	(0.007)	(0.004)
	[2111]	[2325]		
Use Above Threshold:				
Drink Alcohol at least	-0.024*	0.003	0.003	-0.000
Several Times a month	(0.010)	(0.009)	(0.008)	(0.007)
	[1968]	[2084]		
Smoked cigarettes	-0.004	-0.004	-0.003	-0.006
Everyday	(0.010)	(0.008)	(0.007)	(0.006)
	[2063]	[2177]		
Used marijuana at least	-0.001	-0.008	-0.002	-0.0060
1 to 2 Days per Week	(0.007)	(0.005)	(0.005)	(0.0038)
	[2071]	[2185]		
Used No Birth control at	0.049*	0.005	0.000	-0.066**
last sex	(0.022)	(0.022)	(0.016)	(0.015)
	[1158]	[1241]		

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year
observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at
.01-level. Hours variables are measured in units of 1,000.

Table 6

**Effect of Average Annual Hours Worked by Mother on Intensity of Risky Behaviors
By Sex**

	Ave. annual hours, First 3 yrs.		Ave. annual hours, Last 3 yrs.	
	Male	Female	Male	Female
Alcohol Use in Last 12	-0.083	0.022	0.108	0.119*
Months	(0.076)	(0.073)	(0.060)	(0.058)
Change in Mean # of Days	-1.209	0.220	1.605	1.189
	[2143]	[2227]		
Cigarette Use in Last 30 Days	-0.003	-0.067	-0.071	-0.073
	(0.102)	(0.106)	(0.075)	(0.075)
Change in Mean # of Days	-0.009	-0.237	-0.294	-0.258
	[2220]	[2326]		
Marijuana Use in the Last 30	0.044	-0.316*	-0.073	-0.110
Days	(0.122)	(0.137)	(0.099)	(0.099)
Change in Mean # of Days	0.055	-0.202	-0.095	-0.069
	[2149]	[2235]		

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at .01-level. Hours variables are measured in units of 1,000.

Table 7

Effect of Average Annual Hours Worked by Mother on Incidence of Risky Behaviors
By Race/Ethnicity

	Ave. annual hours, First 3 yrs.			Ave. annual hours, Last 3 yrs.		
	African American	Hispanic	White	African American	Hispanic	White
Ever:						
Drank Alcohol	-0.030	-0.009	-0.0101	0.021	-0.006	0.0442*
	(0.023)	(0.033)	(0.022)	(0.018)	(0.024)	(0.0181)
	[1203]	[665]	[1273]			
Smoked Cigarettes	-0.031	-0.061	-0.015	0.005	-0.001	0.020
	(0.019)	(0.032)	(0.023)	(0.014)	(0.025)	(0.019)
	[1319]	[695]	[1240]			
Used Marijuana	-0.018	-0.024	-0.023	-0.007	0.006	0.005
	(0.016)	(0.026)	(0.016)	(0.011)	(0.020)	(0.013)
	[1455]	[792]	[1581]			
Used Other drugs	0.003	-0.005	-0.006	0.001	0.002	0.000
	(0.004)	(0.015)	(0.010)	(0.002)	(0.013)	(0.008)
	[1616]	[928]	[1758]			
Had Sexual Intercourse	-0.074**	-0.047	-0.007	-0.012	0.010	0.0197
	(0.024)	(0.028)	(0.019)	(0.019)	(0.024)	(0.0153)
	[1211]	[766]	[1483]			
Convicted of crime	-0.005	0.006	0.001	-0.010	-0.015	-0.0111
	(0.008)	(0.010)	(0.007)	(0.006)	(0.008)	(0.0060)
	[1649]	[963]	[1824]			
Use Above Threshold:						
Drink Alcohol at least	-0.008	-0.0031	-0.012	0.005	-0.014	0.006
Several Times a month	(0.010)	(0.0165)	(0.010)	(0.007)	(0.012)	(0.008)
	[1479]	[890]	[1683]			
Smoked cigarettes	-0.006	-0.021	0.003	-0.004	-0.002	-0.000
Everyday	(0.007)	(0.013)	(0.013)	(0.004)	(0.009)	(0.010)
	[1622]	[933]	[1685]			
Used marijuana at least	-0.000	-0.014	-0.004	-0.008	0.005	-0.006
1 to 2 Days per Week	(0.007)	(0.011)	(0.005)	(0.004)	(0.008)	(0.005)
	[1567]	[904]	[1785]			
Used No Birth control at	-0.029	-0.031	-0.030	-0.052**	0.083**	0.002
last sex	(0.025)	(0.040)	(0.021)	(0.0168)	(0.030)	(0.017)
	[1016]	[504]	[879]			

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at .01-level.   Hours variables are measured in units of 1,000.

Table 8

**Effect of Average Annual Hours Worked by Mother on Intensity of Risky Behaviors
By Race/Ethnicity**

	Ave. annual hours, First 3 yrs.			Ave. annual hours, Last 3 yrs.		
	African American	Hispanic	White	African American	Hispanic	White
Alcohol Use in Last 12 Months	-0.021	-0.010	-0.081	0.110	0.059	0.137*
	(0.102)	(0.115)	(0.077)	(0.070)	(0.090)	(0.066)
Change in Mean # of Days	-0.289	-0.180	-1.006	1.538	.947	1.669
	[1570]	[972]	[1820]			
Cigarette Use in Last 30 Days	-0.083	-0.247	0.022	-0.190*	0.020	-0.0318
	(0.152)	(0.152)	(0.099)	(0.0961)	(0.112)	(0.0767)
Change in Mean # of Days	-0.237	-1.239	0.127	-0.536	0.103	-0.184
	[1671]	[989]	[1886]			
Marijuana Use in the Last 30 Days	-0.115	-0.240	-0.090	-0.223	0.039	-0.083
	(0.195)	(0.202)	(0.128)	(0.118)	(0.145)	(0.119)
Change in Mean # of Days	-0.102	-0.411	-0.071	-0.204	0.067	-0.067
	[1615]	[936]	[1833]			

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at .01-level. Hours variables are measured in units of 1,000.

Table 9

**Effect of Average Annual Hours Worked by Mother on Incidence of Risky Behaviors
By Marital Status**

	Ave. annual hours, First 3 yrs.		Ave. annual hours, Last 3 yrs.	
	If Married	If Not Married	If Married	If Not Married
Ever:				
Drank Alcohol	-0.018	-0.006	0.060**	-0.004
(n=2930)	(0.021)	(0.021)	(0.016)	(0.017)
Smoked Cigarettes	-0.016	-0.032	0.024	0.005
(n=2997)	(0.019)	(0.020)	(0.015)	(0.015)
Used Marijuana	-0.005	-0.026	0.013	-0.009
(n=3520)	(0.015)	(0.015)	(0.012)	(0.011)
Used Other drugs	-0.006	0.008	-0.002	-0.002
(n=3919)	(0.006)	(0.007)	(0.006)	(0.005)
Had Sexual Intercourse	-0.030	-0.056**	0.040*	-0.013
(n=3215)	(0.019)	(0.019)	(0.016)	(0.015)
Convicted of crime	-0.001	0.005	-0.005	-0.016**
(n=4040)	(0.007)	(0.006)	(0.007)	(0.005)
Use Above Threshold:				
Drink Alcohol at least	-0.019	-0.009	0.009	-0.004
Several Times a month	(0.010)	(0.009)	(0.008)	(0.006)
(n=3729)				
Smoked cigarettes	0.008	-0.009	-0.006	-0.005
Everyday (n=3868)	(0.010)	(0.009)	(0.007)	(0.007)
Used marijuana at least	-0.007	-0.003	0.006	-0.009*
1 to 2 Days per Week	(0.007)	(0.006)	(0.006)	(0.004)
(n=3881)				
Used No Birth control at	-0.047	-0.022	-0.042*	-0.030*
last sex (n=2106)	(0.026)	(0.021)	(0.019)	(0.015)

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year
observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at
.01-level. Hours variables are measured in units of 1,000.

Table 10

**Effect of Average Annual Hours Worked by Mother on Intensity of Risky Behaviors
By Marital Status**

	Ave. annual hours, First 3 yrs.		Ave. annual hours, Last 3 yrs.	
	If Married	If Not Married	If Married	If Not Married
Alcohol Use in Last 12	-0.086	-0.024	0.185**	0.071
Months (n=3978)	(0.075)	(0.078)	(0.060)	(0.061)
Change in Mean # of Days	-0.795	-0.227	1.727	0.676
Cigarette Use in Last 30 Days	0.138	-0.178	-0.058	-0.101
(n=4131)	(0.105)	(0.105)	(0.078)	(0.075)
Change in Mean # of Days	0.516	-0.669	-0.218	-0.380
Marijuana Use in the Last 30	-0.061	-0.152	-0.018	-0.136
Days (n=3992)	(0.133)	(0.143)	(0.108)	(0.096)
Change in Mean # of Days	-0.055	-0.140	-0.017	-0.128

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at .01-level. Hours variables are measured in units of 1,000.

Table 11

Effect of Average Annual Hours Worked by Mother on Incidence of Risky Behaviors
Fixed Effects, Conditional Logit Models and Instrumental Variables, Linear Models

	"Mother" Fixed Effects				"Grandparent" Fixed Effects				Instrumental Variables	
	Ave. annual hours, First 3 yrs.		Ave. annual hours, Last 3 yrs.		Ave. annual hours, First 3 yrs.		Ave. annual hours, Last 3 yrs.		Ave. annual hrs, First 3 yrs.	Ave. annual hrs, Last 3 yrs.
	Coefficient Estimate	Marginal Effect	Coefficient Estimate	Marginal Effect	Coefficient Estimate	Marginal Effect	Coefficient Estimate	Marginal Effect	Coefficient Estimate	Coefficient Estimate
Ever:										
Drank Alcohol	0.633** (0.246) [1414]	0.086	0.170 (0.174)	0.023	0.131 (0.177) [1597]	0.019	-0.086 (0.122)	-0.013	-0.033 (0.081) [3141]	0.047 (0.066)
Smoked Cigarettes	0.177 (0.269) [1143]	0.029	0.324 (0.174)	0.054	-0.136 (0.191) [1325]	-0.023	0.191 (0.132)	0.032	-0.211** (0.077) [3254]	0.038 (0.064)
Used Marijuana	0.322 (0.256) [1398]	0.050	-0.082 (0.162)	-0.013	0.150 (0.196) [1576]	0.023	-0.045 (0.127)	-0.007	0.002 (0.060) [3828]	-0.016 (0.054)
Used Other drugs	0.214 (0.375) [585]	0.035	0.001 (0.250)	0.000	0.222 (0.312) [679]	0.034	0.043 (0.208)	0.007	-0.005 (0.037) [4302]	-0.040 (0.036)
Had Sexual Intercourse	0.075 (0.242) [1861]	0.008	0.101 (0.173)	0.010	-0.266 (0.190) [1990]	-0.030	0.043 (0.125)	0.005	-0.082 (0.072) [3460]	0.057 (0.060)
Convicted of crime	0.140 (0.355) [708]	0.021	-0.070 (0.212)	-0.011	-0.276 (0.297) [822]	-0.039	-0.088 (0.171)	-0.012	0.065 (0.033) [4436]	-0.035 (0.030)
Use Above Threshold:										
Drink Alcohol at least Several Times a month	0.055 (0.325) [1112]	0.007	-0.291 (0.201)	-0.038	0.006 (0.267) [1227]	0.001	-0.102 (0.165)	-0.013	0.004 (0.040) [4052]	-0.006 (0.033)
Smoked cigarettes Everyday	0.435 (0.315) [913]	0.059	0.145 (0.227)	0.020	0.176 (0.265) [1019]	0.023	-0.089 (0.177)	-0.012	-0.081 (0.042) [4240]	-0.017 (0.038)
Used marijuana at least 1 to 2 Times per Week	-0.436 (0.480) [462]	-0.069	0.207 (0.311)	0.033	-0.557 (0.371) [541]	-0.084	0.005 (0.250)	0.001	0.011 (0.027) [4256]	-0.017 (0.024)
Used No Birth control at last sex	-0.615* (0.308) [1143]	-0.118	-0.072 (0.152)	-0.014	-0.596* (0.246) [1232]	-0.110	-0.155 (0.133)	-0.029	0.105 (0.063) [2399]	-0.097 (0.061)

Note: Standard errors are presented in parentheses. Sample sizes are based on person-year observations and are in square brackets. * indicates coefficient is significant at .05-level, ** at .01-level. Hours variables are measured in units of 1,000. For the conditional logits, marginal effects are calculated as $P_i(1-P_i)a$. (Greene 1997)

Appendix: Discussion of NLSY79-YA Sample

The NLSY79-YA is administered biennially and data from 1994, 1996, 1998, and 2000 are currently available. Although the NLSY79 is nationally representative, as explained in the text, the sample of young adults who were eligible for the Young Adult supplement by 2000 is composed only of these women's children who were born in 1985 or earlier. Hence, the NLSY79-YA overrepresents youth born to young mothers, as roughly 40 to 45% of all children that will eventually be born to the NLSY79 women had been born by 1985. In addition, the NLSY79 oversamples African Americans and Hispanics, which means that African American and Hispanic youth are overrepresented in the NLSY79-YA as well. It is inappropriate to use weights to make the sample more representative because multiple years of data are used and the sample varies by year. Despite these shortcomings, the NLSY79-YA has a big advantage over other datasets, in that data on both the young adults and their mothers are available from the time the children were very young.

Table A1 compares the incidence rates of risky behaviors for high school youths from the NLSY79-YA with those from two nationally representative data sets, Monitoring the Future (MTF) and the Youth Risk Behavior Survey (YRBS). For all years considered, engagement in cigarette, alcohol, and drug use is substantially lower in the NLSY79-YA. Part of this difference is due to the overrepresentation of African Americans in the NLSY79-YA, as the incidence rates of whites are higher than those of African Americans for cigarette use, frequent cigarette use, alcohol use and drug use. When the rates of risky behavior reported in the NLSY79-YA and in the national surveys are compared by race, they are much closer for all years except 2000—with the exception of drug use where rates from the NLSY79-YA continue to be lower. In fact, when

comparisons are done by race, the differences are rarely significant; admittedly this is in part driven by small sample sizes for the NLSY79-YA.

Although the data on sexual activity and condom use in 1994 from the NLSY79-YA appear consistent with the YRBS in 1994, the rates diverge in the later years with the incidence of sex being lower and condom use being higher in the NLSY79-YA.

Table A1: Comparison of Rates of Risky Behaviors, NLSY79-YA vs. National Surveys

	1994		1996		1998		2000	
	NLSY79-YA	National Survey	NLSY79-YA	National Survey	NLSY79-YA	National Survey	NLSY79-YA	National Survey
Cigarette Use								
Smoked Daily in Last 30 days[a]								
10th graders	5.6	16.3 (1995)	11.6	18.3	7.1	15.8	6.5	14.0
12th graders	4.5	21.6	8.3	22.2	12.6	22.7	15.9	20.9
Currently Smokes[b]								
9th through 12th graders	19.2	31 (1993)	22.9	35 (1995)	19.8	36 (1997)	14.9	35 (1999)
Frequently Smokes								
9th through 12th graders[b]	8.0	14 (1993)	10.6	16 (1995)	11.4	17 (1997)	8.8	17 (1999)
Alcohol Use								
Drank in Last 30 days[a]								
10th graders	27.3	--	28.8	--	24.3	38.8	43.9	52.0
12th graders	29.5	--	35.5	--	30.1	41.0	55.8	50.0
Drug Use								
Marijuana in Last 30 days[a]								
10th graders	9.5	19.1 (1995)	14.4	20.4	8.1	18.7	4.3	19.7
12th graders	9.1	21.1 (1995)	9.2	21.9	11.5	22.8	5.6	21.6
Inhalant in Last 30 days[a]								
10th graders	2.3	3.5 (1995)	0.9	3.3	1.3	2.9	0	2.6
12th graders	3.4	3.2 (1995)	0.9	2.5	0	2.3	0.04	2.2
Cocaine in Last 30 days[a]								
10th graders	0	1.7 (1995)	0.3	1.7	0.3	2.1	0	1.8
12th graders	1.1	1.8 (1995)	0.9	2.0	0	2.4	0	2.1
Sexual Activity								
Ever Sexual Intercourse[b]								
9th to 12th graders	49.0		43.5	53 (1995)	39.2	48 (1997)	29.5	50 (1999)
Had Sex[b]								
In last 30 days, 9th-12th graders	29.4		24.3		22.5		12.3	
In last 3 mo., 9th-12th graders		38 (1993)		38 (1995)		35 (1997)		36 (1999)
In last 6 mo., 9th-12th graders	41.2		35.0		32.0		23.8	
Condom used at last sex[b]								
Had sex in last 30 days, 9th-12th graders	51.4		62.7		62.0		42.3	
Had sex in last 3 mo., 9th-12th graders		53 (1993)		54 (1995)		57 (1997)		58 (1999)
Had sex in last 6 mo., 9th-12th graders	59.1		64.6		65.1		42.5	

Notes: [a] indicates that the data from the national survey are from Monitoring the Future (MTF) and [b] indicates that the data from the national survey are from the Youth Risk Behavior Survey (YRBS). The source for MTF and YRBS data is U.S. Department of Health and Human Services (2001).