

**Maternal Work Hours and Adolescents' School Outcomes
Among Low-Income Families in Four Urban Counties***

Lisa A. Gennetian

Leonard M. Lopoo

Andrew S. London

* Lisa A. Gennetian, The Brookings Institution, Economic Studies, 1775 Massachusetts Avenue, NW, Washington, DC 20036-2118; gennetl@nber.org; phone: (914) 834-2200. Leonard M. Lopoo, Department of Public Administration and Center for Policy Research, Syracuse University. Andrew S. London, Department of Sociology and Center for Policy Research, Syracuse University. Gennetian gratefully acknowledges funding by the William T. Grant Foundation and Grant 1 RO3 HD047034-01A1 from the National Institute of Child Health and Human Development. Many thanks to Greg Duncan, Wen-Jui Han, Aletha Huston, Virginia Knox, Pamela Morris and Nandita Verma for comments on early drafts, to Erika Lundquist for careful data preparation and analysis, and Francesca Longo for research assistance support. All opinions and errors are the sole responsibility of the authors. This study is part of MDRC's Next Generation project, which examines the effects of welfare, antipoverty, and employment policies on families and children. Data for this study were collected under the auspices of MDRC's Project on Devolution and Urban Change.

**Maternal Work Hours and Adolescents' School Outcomes Among Low-Income Families in
Four Urban Counties**

ABSTRACT

We examine how changes in maternal work hours affect adolescent children's school participation and performance outcomes using data from interviews in 1998 and 2001 with approximately 1,700 women who in May, 1995 were welfare-reliant, single mothers of adolescents living in neighborhoods of concentrated poverty in Cuyahoga (Cleveland), Los Angeles, Miami-Dade, and Philadelphia counties. Analyses control for a broad array of mothers' characteristics, including their psychological and physical health, experiences with domestic violence and substance abuse, as well as unobserved time-invariant characteristics. In fixed effects models, we find unfavorable effects of increased maternal work hours on 3 of 6 outcomes: skipping school, performing above average, and parental contact about behavior problems. Sons seem to be particularly sensitive to changes in mothers' hours of work.

INTRODUCTION

Low-income youth face an array of barriers to academic attendance, achievement, and high school completion, which in turn affects their opportunities for ongoing secondary education and, ultimately, their labor market success (Duncan and Brooks-Gunn 1997; MacLeod 1995). Indeed, increased human capital among youth is critical to future economic security and reducing their dependence on cash assistance, both of which are key policy goals related to at-risk youth (Card 1999). Unlike youth from more advantaged families, low-income youth are more likely to be raised by single mothers (Edin and Kefalas 2005), live in resource-poor and unsafe neighborhoods (Brooks-Gunn, Duncan, and Aber 1997), attend low-quality schools (Kozol 1991), be members of economically unstable families (Scott et al. 2004), and face discrimination and differential treatment in a variety of contexts (Fine 2005; Lareau 2003). Welfare-reliant mothers of these youth are increasingly under pressure to leave the welfare rolls and patch together financial resources through their own wage labor and that of other family members (Blank and Haskins 2001; London, Scott, and Hunter 2002). Many struggle to balance the new opportunities, demands, and limitations associated with Temporary Assistance for Needy Families (TANF) and the exigencies of the low-wage labor market with their children's needs for attention, care, and supervision (London et al. 2004; Scott, London, and Hurst 2005; Weigt 2006).

How youth in these circumstances fare while mothers change the amount of time they spend in paid employment—and struggle to achieve or maintain independence from cash assistance—is relatively understudied (Duncan and Chase-Lansdale 2001). Most research on this question has focused on young children because they are viewed as especially susceptible developmentally to the potential costs or benefits of maternal employment (Chase-Lansdale et al.

2003; Morris et al. 2001; Waldfogel, Han, and Brooks-Gunn 2002). In this paper, we examine how change in maternal work hours affects adolescent children's school outcomes using data from interviews in 1998 and 2001 with approximately 1,700 women who in May, 1995 were 18 to 45 year old, welfare-reliant, single mothers living in the most-disadvantaged neighborhoods in four urban counties—Cuyahoga (Cleveland), Los Angeles, Miami-Dade, and Philadelphia.

This study has several features that contribute to the extant literature. Methodologically, we take advantage of a rarely-available, rich set of covariates to control for maternal physical and psychological health, domestic violence, substance abuse, and several aspects of socio-economic well-being and family structure. With two waves of data we also employ a fixed-effects technique that controls for time-invariant, unobserved characteristics. Substantively, the effect of average hours of maternal employment on adolescents' school participation and performance outcomes is assessed linearly as well as trichotomously, depicting part-time work (1 to 30 hours) separately from full-time work (31 hours or more per week), with no hours of paid employment as the reference category. We additionally assess whether the effects of maternal employment differ for adolescent-aged sons and daughters (Eccles 1999) and conduct a number of supplemental analyses to enhance our understanding of the effects we observe.

BACKGROUND AND CONCEPTUAL MOTIVATION

We draw on theories spanning a variety of social science disciplines to inform hypotheses about how changes in parents' labor force participation can affect children's development generally, and school outcomes specifically. From the perspective of economic theory, parental employment can affect children's development by influencing the amount and distribution of parental resources and time investments (Becker and Tomes 1979, 1986; Becker 1981; Ruhm 2006). All else equal, if increased labor force participation yields increased income, then one

would expect greater parental investment in their children's human capital. At the same time, working more hours constrains the time available for children (Kurz 2002; London et al. 2004; Milkie et al. 2004); however, parents may arrange their non-work hours so that quality time with their children is not reduced (Bianchi 2000; Bryant and Zick 1996; Chase-Lansdale et al. 2003; Zick, Bryant, and Osterbacka 2001). Economic theory also predicts that older youth assess the likely returns to continued education versus immediate employment—an assessment that might be altered by the parent's ability to support the family without financial contributions from the child.

Sociological and psychological theories point to parenting as one mechanism by which maternal employment, and its subsequent influences on parental emotional well-being, can affect interactions between parents and their children (Chase-Lansdale and Pittman 2002; Parcel and Menaghan 1994). If mothers find jobs that are rewarding and challenging, then they might also experience decreases in psychological distress; decreased maternal depression could in turn translate into increased warmth and responsiveness in parenting, which is known to be beneficial for children's development (Moore and Driscoll 1997; Zaslow, McGroder, and Moore 2000). Alternatively, pressure to find work, securing a low-quality job (e.g., with inflexible schedules, tedious tasks, and low wages), or working more hours in an unsatisfying job can increase stress, reduce emotional well-being, and increase harsh and less responsive or consistent parenting (Hofferth et al. 2000; McCloyd 1990). Working parents may simply have fewer psychosocial resources available to devote to good parenting even if they are spending the same amount of time with their children as they did when they were not working (Baumrind 1991; Menaghan and Parcel 1995). Increases in nonstandard work hours might affect parents' knowledge and monitoring of their adolescent's lives, which in turn, is linked to better school outcomes (Baker

and Stevenson 1986; Baumrind 1989; Kerr and Stattin 2000; Sampson and Laub 1994).

Developmental psychologists and sociologists also emphasize the importance of socialization in children's attainment. Mothers who work model normative behaviors relevant to labor force attachment for their children and thereby serve as role models (London et al. 2004).

Developmental psychology additionally pays attention to the timing of changes in parent-child relationships and family life across a child's developmental lifespan. Spending less time at home because of work may lead parents to expect adolescents to take on new "adult" tasks, which could lead to increased responsibility (Dodson and Dickert, 2004; Hsueh and Gennetian 2006) and better behavior. For some adolescents, this could also lead to resentment, acting out, failure to complete unsupervised tasks (such as homework), and resistance to any kind of control imposed by an adult (Burton, Brooks, and Clark 2002).

Changes in maternal work could affect sons' and daughters' development and school participation and performance differently (Eccles 1999). When hours of employment increase, mothers may rely more on their adolescent-aged daughters than their sons to help with household chores and responsibilities (Crouter et al. 2001). Parents may also invest differently in the future education of their sons and daughters (Butcher and Case 1994).

Most of the available research on the effect of maternal employment on adolescents examines two-parent or middle-to higher-income families and generally finds few or slightly favorable effects on outcomes such as adolescent achievement and teen childbearing (e.g., see Bogenschneider and Steinberg 1994; Aughinbaugh and Gittleman 2003; Lopoo 2004).

Consistent with these general findings, the few studies that have explicitly focused on low-income, single mother samples—particularly during the 1990s, a period during which there were dramatic declines in welfare caseloads and increases in the labor force participation of single

mothers—have also found neutral to favorable associations between maternal employment and adolescent self-esteem and academic achievement (Allesandri 1992; Kalil, Dunifon, and Danziger 2001; McLoyd et al. 1994; Ruhm 2006). These relationships appear to be quite robust in national, regional, and urban area samples, and are observed regardless of whether prior or current welfare receipt of the parent is considered (e.g., see Chase-Lansdale et al. 2003).

In contrast, research based on a synthesis of experimental studies of welfare and work programs finds that welfare and work policies, per se, produce unfavorable effects on a range of schooling outcomes among adolescents, particularly those who have a younger sibling at home (Gennetian et al. 2004). A somewhat complementary finding also emerged in work using data from the Panel Study of Income Dynamics (PSID), which showed that stringent welfare policies, measured at the state level over time, increased the rate of dropping out of school (Hao, Astone, and Cherlin 2004). Additionally, a recent study that utilized a more-nuanced characterization of maternal work found that adolescents with single mothers who are in “bad” jobs (i.e., full-time jobs with low pay and no health insurance) experienced more grade repetition (Kalil and Ziol-Guest 2005).

SAMPLE, DATA, AND MEASURES

Data for this study are from the Project on Devolution and Urban Change (henceforth, Urban Change), a longitudinal study conducted in Cuyahoga (Cleveland), Los Angeles, Miami-Dade, and Philadelphia counties in the early years of the implementation of the welfare reforms brought about by the passage in 1996 of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA). These four urban counties accounted for approximately 14% of the entire U.S. welfare caseload as of 1999 (Allen and Kirby 2000).

The Urban Change survey involved women who in May 1995 were single mothers between the ages of 18 and 45 years, were receiving cash assistance (Aid to Families with Dependent Children) and/or Food Stamps, and living in census tracts where either the poverty rate exceeded 30% or the rate of welfare receipt exceeded 20%.¹ From administrative records comprising the entire caseload who met these criteria, approximately 1,000 women were randomly sampled in each site. First round interviews were completed between March, 1998 and February, 1999, with a response rate of 79%.² An analysis of response bias indicated that whites who were sampled were significantly less likely than African Americans to have been interviewed in 1998, while women with more children in their households were significantly more likely to have been interviewed; however, in both instances, the differences were small (Polit, London, and Martinez 2001).

Second round interviews were conducted in the spring of 2001. Of the 3,960 women who were surveyed in 1998, 3,260 were re-interviewed in 2001, for an overall retention rate of 82%. Results of an analysis of attrition bias show that respondents who completed the 2001 interview did not statistically differ from non-responders across a variety of demographic characteristics in Cuyahoga County (Brock et al. 2002). In Miami, however, whites, Hispanics, persons under the age of 25 years, and widows were less likely to complete the 2001 interview (Brock et al. 2004), while in Philadelphia there was differential response by marital status (Michalopoulos et al. 2003). In Philadelphia, separated women were most likely to complete the

¹ Wilson (1987) and Massey, Gross, and Shibuya (1994) define neighborhoods of concentrated poverty as those where 20% or more of the residents live below the poverty threshold. Urban Change chose a higher threshold of poverty strategically to target the most economically disadvantaged neighborhoods where the impacts of welfare reform would likely be the most evident.

² In the first round interview, the Urban Change project obtained high response in each of the four sites: 80.0% in Cuyahoga County, 75.6% in Los Angeles, 78.7% in Miami, and 80.0% in Philadelphia (Polit, London, and Martinez 2001). Overall, 9% of those sampled could not be located, 10% refused to participate, and 2% did not participate for other reasons. For additional details on response bias in the 1998 survey, see Appendix A in Polit, London, and Martinez (2001).

2001 interview, followed by single women, and finally married women. In Los Angeles, the full set of demographic predictors did not significantly differentiate responders from non-responders, although Latinas were significantly more likely than African Americans to respond to the 2001 interview and women with a GED but no college were significantly less likely to respond than women with a high school diploma but no college (Polit et al. 2005).

The women who participated in the Urban Change survey provided detailed information about a wide range of topics, including their experiences with welfare reform and use of support and safety net services; employment histories, wages, hours, and income; family configurations, living arrangements, child care, and parenting; perceptions of their neighborhoods; experiences of material hardships; health status; and experiences of domestic violence. In addition to providing selected information about the well-being of every biological or adopted child in the household, all of the female survey respondents provided in-depth information about two pre-designated focal children, a Focal child A (ages 2-6 years in 1998) and a Focal child B (ages 12-18 years in 1998).

As part of a larger project, we converted the original, mother-level Urban Change dataset for each year into a multi-year, child-level dataset. Because detailed information was obtained for a range of school participation and performance outcomes and there is a relative dearth of rich data on low-income youth and their parents, this study focuses on those outcomes for adolescents who are Focal B children. For the analytical sample, we select only those Focal B children who were less than 19 years old and living in their mother's household at both interviews, whose mothers were interviewed in both 1998 and 2001, and who had information reported at both interviews for at least one of the schooling outcomes. In 1998, the ages of the adolescents ranged from 12 to 16 years, with the majority being age 14 or less (mean age = 13.2,

s.d. = 1.1). In 2001, the ages of adolescents range from 14 to 18 years, with the majority being age 17 or less (mean = 15.9, s.d. = 1.1). Satisfaction of these criteria leaves a maximum potential sample of 1,698 child-year observations: 958 in 1998 and 740 in 2001.³ As detailed in the Appendix, the Focal B adolescents who were excluded from the analytic sample because they did not meet the inclusion criteria appear to be worse off across numerous adolescent and maternal indicators than those who were included in our analyses.⁴

This study examines a set of school-related outcomes that we group broadly into participation and performance outcomes. The participation outcomes include maternal reports regarding: (1) whether the child had skipped school or cut classes without permission in the prior twelve months; (2) the number of days of school missed in the prior four weeks; and (3) the number of days late to school in the prior four weeks.⁵ The maternally-reported performance outcomes include an overall current school performance variable scaled from “1: Not Well at All” to “5: Very Well,” with 3 set to “Average,” and an indicator whether the mother had been contacted about attendance/behavior/academic problems in the prior twelve months. From the overall school performance variable, we created two indicator variables to capture thresholds of

³ Response rates varied across outcomes; therefore, our sample sizes are smaller than the maximum in the models and differ depending on the outcome.

⁴ The Urban Change survey collected data on a number of adolescent outcomes in addition to the school participation and performance outcomes reported in this paper (some of these are included in Appendix Table 2). Analysis of outcomes unrelated to school participation and performance is beyond the scope of the current investigation. The current analyses also exclude school-related outcomes that did not have a discrete reference period because the identification strategy depends on understanding the temporal order of maternal employment changes and changes in the outcomes.

⁵ Data are missing for approximately 200 observations for the number of days missed or number of days late outcomes because the survey interview took place during summer months. Wave 1 interviews were evenly distributed over each month between March, 1998 and March, 1999. Wave 2 interviews were evenly distributed over each month between March, 2001 and November, 2001. Analyses indicate that respondents who were interviewed during the summer months do not statistically differ on a broad range of observable characteristics from respondents who were interviewed during other months. Additionally, analyses examining the effects of work hours on the school performance for the subset of adolescents with missing data on number of days late or missed show a similar pattern of findings as analyses for the full sample of adolescents with school performance information.

above- and below-average performance respectively. We code above-average performance equal to one if the mother reported a rating of “4: Well” or “5: Very Well,” and 0 otherwise. We set below-average performance equal to one if the mother reported a rating of “2: Below Average” or “1: Not Well At All,” and 0 otherwise. All of the outcomes are measured for only those adolescents who were attending school at both survey waves. Three of these outcome measures are similarly collected by the U.S. Department of Education for the Digest of Education Statistics allowing us to draw a comparison with a national sample of 10th graders in 2002 (U.S. Department of Education, 2005). Roughly 10 % of the adolescents in our sample missed more than 6 days of school in one month compared to 17.2 % of 10th graders who report missing more than 6 days of school over a much longer time period, i.e., the first half of the current school year. Nearly 31 % of parents of 10th graders nationally were contacted about problems their child was having with school compared to 41 % in our full analysis sample.

Urban Change collected information on maternal employment for up to four jobs. For each of these positions, respondents were asked: “Including overtime, how many hours per week (do/did) you usually work on this job?” We created the maternal work hours measure by summing the responses to this question for all current jobs. Among the mothers who were working at the time of the 2001 survey, the majority, 87.4%, had one job, while 10.3% had two jobs. In the models below, we examine both a linear and a categorical specification (i.e., a specification with indicators for working 30 or fewer hours and working more than 30 hours, with no work as the reference category). We focused on a thirty hour threshold to address questions of practical policy significance, as state TANF programs’ weekly work or work-related activities requirements are often at 30 or more hours (Parrott et al. 2006).⁶

⁶ In supplemental analyses (available upon request), we considered alternate specifications for the maternal work hours variable. Specifically, we looked at a more fine-grained specification at the high end

The empirical models include the child's sex, race/ethnicity, and age, as well as the mother's age, educational attainment, marital status, cohabitation status, and place of birth (i.e., U.S. or not). We also include several indicators of maternal health and well-being, including her SF-12 physical health component score (Ware, Kosinski, and Keller 1996), her score on the Center for Epidemiological Studies-Depression (CES-D) scale (Radloff 1977), an indicator for whether or not a health condition limits her ability to work, indicators for whether or not the mother has been physically or emotionally abused in the past year, and an indicator for whether she reported using a hard drug in the past month.^{7,8} We also include measures for the presence of another adult in the household, the presence of a child other than the respondent's own or adopted children, and the number of children in the household. Finally, we included site indicators, as well as interactions between site and the Hispanic and U.S. born indicators respectively. See Table 1 for a list of covariates with values for the study sample.

To maximize our sample size, we used ordinary least squares (OLS) regression to impute values for the covariate values that were missing (other than maternal work hours). In the imputation process we included all of the other covariates as well as the year from which the data were drawn. We include a set of indicator variables (one for each covariate with over ten values assigned) in all models, which are set to one if the value for a given variable was imputed. The findings are nearly identical with and without these controls for missing data on the covariates.

of the distribution, distinguishing those who worked 30 to 40 hours from those who worked 41+ hours (or 41-50 hours and 51+ respectively). Results from these specifications are consistent with the results reported here.

⁷ The maternal health and abuse variables used in this paper were derived from a paper-and-pencil self-administered questionnaire (SAQ). Overall, in the 1998 interview, 90 women who completed the oral, computer-assisted personal interview did not complete the SAQ (Polit, London, and Martinez 2001). SAQ completers and non-completers were comparable on a broad range of variables. Given the small number of non-completers and the fact that they do not appear to differ substantially from completers, non-response to the SAQ does not appear to have biased the results reported in this paper.

⁸ Hard drugs were identified as cocaine, crack, heroin, PCP, or ice.

ANALYTIC APPROACH

Our aim in this work is to capitalize on the longitudinal variation in maternal work hours and adolescent outcomes such that we can estimate the contemporaneous effects of maternal work hours on adolescent schooling performance and participation. We begin with a reduced form specification—using OLS or logit techniques as appropriate—modeling outcome y for adolescent i in year t controlling for a matrix of time-invariant (\mathbf{Z}) and time-varying factors (\mathbf{X}):

$$y_{it} = \alpha + \beta_1 EMP_{it} + X_{it}' \beta_2 + Z_i' \beta_3 + \varepsilon_{it}, \quad (1)$$

where EMP represents a measure of maternal work hours.

Equation (1) yields unbiased and consistent estimates of β_1 if $\text{cov}(\varepsilon, EMP) = 0$. This condition is unlikely as a variety of unobserved factors are likely to create an association between maternal work hours and adolescent outcomes. For example, increases in maternal work hours might be facilitated when adolescents are highly competent, responsible, or mature. In contrast, persistent emotional/social/problem behavior might reduce maternal work hours. In the absence of experimental data, perhaps the best econometric approach to estimate unbiased coefficients for maternal employment is an instrumental variables model. Unfortunately, we were unable to identify a variable that is correlated to the endogenous variable (maternal work hours) that was plausibly independent of the error term. Given the close relationship between human capital accumulation and labor force participation, most factors that would induce change in mother's work would also probably influence an adolescent's school participation and performance.

To control for time-invariant, unobserved characteristics, we have chosen to use a fixed effects model for the continuous outcomes and Chamberlain's (1980) fixed effects logit model

for the binary outcomes.⁹ More specifically, these models remove the time-invariant fixed effect from the error term (η_i):

$$y_{it} = \mu + \gamma_1 EMP_{it} + X'_{it} \gamma_2 + Z'_i \gamma_3 + \eta_i + \varepsilon_{it}. \quad (2)$$

Operationally, these fixed effects models use variation in the outcome and maternal employment within a given family over time to identify the maternal employment coefficient. Because these models use variation within a mother-adolescent dyad, characteristics that are time invariant cannot be the explanation for changes in the outcome; thus, the coefficient for maternal employment should not suffer from bias due to unobserved time-invariant characteristics. Below, we further discuss the variation over time in maternal employment and the strength of our model in detecting this variation.

While an improvement over OLS or logit models, fixed effects models have limitations. As mentioned earlier, one needs variation in the outcome to identify the coefficient for maternal work hours in all fixed effects models. In fact, the likelihood function for the fixed effects logit requires variation in the outcome across waves; individuals who do not have a different value for Y in the two observed years are omitted from the identification process. If individuals with no variation in the outcome over time are different from those who do have variation over time, then our results are not generalizable. In addition, even though we are fortunate to have access to a broad array of covariates at both time points – including maternal physical and psychological health, measures of emotional and physical abuse, and substance use – other unmeasured omitted factors that vary over time and that are correlated with both maternal work hours and the outcome might continue to produce bias in the maternal work hours coefficients.

FINDINGS

⁹ As a sensitivity check for the fixed effects logit model, we also employed a fixed effects linear probability model and found results that are nearly identical to those we report below.

For ease of exposition, we group the educational outcomes into two categories: school participation and school performance. Table 2 reports results using a linear specification for average hours of maternal work on these outcomes and presents estimates obtained from OLS or logit models and from fixed-effects models.

In Table 2, the initial OLS or logit models for all of the participation outcomes show trivial and statistically non-significant effects for maternal work hours. The fixed effects models, however, illustrate the importance of omitted variable bias. While the maternal employment coefficient remains statistically unrelated to the number of days missed and number of days tardy, the coefficient estimate is positive and statistically significant for skipping school. In addition to the coefficient estimates for the logit models, we also report marginal effects [in brackets] or the change in the probability of the outcome given a one unit change in maternal work hours for the logit models. The marginal effect for maternal work hours in the skipped school model is 0.4 percentage points.¹⁰

Initial results for the school performance outcomes follow a similar pattern: we find no statistically significant relationship between maternal employment and school performance outcomes in the logit models. However, we do find statistically significant coefficients in two of the fixed effects models. While maternal employment does not appear to influence the probability that a child performs poorly in school, it is related to the probability that the adolescent will perform well in school with a marginal effect of -0.4 percentage points. We also find a positive, statistically significant relationship between maternal employment and parents

¹⁰ $\frac{\partial P}{\partial EMP} = P * (1 - P) * \gamma_1$, where P is the probability of the outcome. Because we cannot predict P with a fixed effects logit model (i.e., the fixed effect is unidentified), we use the sample proportion to estimate P. Hence, one should interpret the marginal effect as the change in the probability of the outcome from the sample proportion given a marginal change in maternal employment hours. In this instance, $(0.180) * (0.820) * (0.0242) = 0.0036 \approx 0.4$ percentage points.

being contacted for behavior problems. A one-hour increase in maternal work hours is associated with a 0.3 percentage point increase in the probability that a parent was contacted by the school.

By using a linear maternal work hours variable in Table 2, we are implicitly assuming that each additional hour of work will produce the same change in the outcome. In Table 3, we report results from fixed-effects models with the categorical specification of maternal work hours. Changing the measure of maternal work hours does not alter the null findings for the “days missed” and “days tardy” outcomes. We do find that maternal employment is statistically significantly related to skipping school regardless of the mother’s work status. Compared to the children of non-working mothers, the children of mothers who work between 1 and 30 hours are 20 percentage points more likely to skip school (i.e., more than twice as likely as the proportion in the sample). Similarly, compared to the adolescent children of non-working mothers, the children of mothers who work 31 or more hours are 16 percentage points more likely to skip school. The effect of working between 1 and 30 hours does not statistically differ from the effect of working 31 or more hours. For the performance measures, more specifically, for the “above average performance” outcome, the categorical specification of employment shows that the negative relationship for maternal employment only surfaces in a statistically discernable way when mothers work more than 30 hours. Compared to the children of non-working mothers, the children of mothers who work more than 30 hours per week are 17 percentage points less likely to perform above average in school. We also find a significant positive coefficient for mothers who worked more than 30 hours in the “parent contacted about problem behavior” model and that this coefficient statistically differs from the coefficient on mothers who worked 30 hours or

less. The marginal effect for these families is 14 percentage points or an increase of 35% over the sample proportion.

Do the effects of maternal employment on any of these school participation and performance outcomes differ for sons compared to daughters? Table 4 shows results from fixed-effects models that include interactions between a categorical specification for work hours and an indicator variable equal to one if the adolescent is male. Prior findings showed that maternal employment influences the probability that adolescents skipped school and that the mother was contacted about problem behavior. The results reported in Table 4 suggest that these relationships do not differ by the child's sex. However, we do find evidence that the relationship between maternal employment and the number of days tardy and performing above average is different for sons and daughters. Compared to the adolescent children of non-working mothers, the sons of mothers who worked 1 to 30 were late about 1.2 days more in the prior four weeks than the daughters of mothers who worked the same number of hours. The gender difference, including the magnitude of the difference, was the same for the adolescents of mothers who worked 31 or more hours per week. Compared to the children of non-working mothers, sons of mothers who worked 1 to 30 hours were 28 percentage points less likely to perform above average than daughters of mothers who worked comparable hours.

SUPPLEMENTAL ANALYSES

Employment Transitions

In our preferred models, the fixed effects specification, we identify the relationship between maternal work hours and the adolescent schooling outcomes using adolescent-specific variation over time. Since intra-individual variation is crucial to the model, we were concerned about the generalizability of the model if all of the variation in maternal employment was confined to a

particular portion of the distribution of work hours (e.g., if the only changes observed were among mothers increasing work hours from 25 to 31 hours).

In order to assess whether this is a concern in our analyses, we constructed a “transition matrix” for the maternal employment variables in our panel data. Since it has the largest sample size, we broke down the analytical sample from the “contacted parents for problem behavior” model into the proportion of the adolescents with mothers who worked zero, between one and 30, and more than 30 hours in 1998 (see Table 5). In 1998, 52% of the mothers did not work, 13% worked between one and 30 hours, and 35% worked more than 30 hours per week on average. Of the mothers who were not working in 1998, 57% were still not working in 2001. Of the 43% who were working in 2001, 15% were working between 1 and 30 hours and 28% were working more than 30 hours. Of the mothers who were working one to 30 hours in 1998, 24% were no longer working, 25% were still working one to 30 hours, and 51% were working more than 30 hours. Finally, of the women working more than 30 hours in 1998, 72% were still working more than 30 hours, 20% were no longer working, and roughly 9% were working one to 30 hours. These descriptive results show that employment transitions in the data occurred throughout the distribution of maternal employment hours with variation coming from both increases and decreases in maternal employment over time.

Sample Composition or Fixed Effect?

The fixed effect models show some statistically significant relationships compared to the OLS and logit models. We follow Lopoo (2005) and conduct a supplemental analysis to ascertain the extent to which the results reflected the removal of bias via the fixed effect or the composition of the analytic sub-sample. As explained earlier, the fixed effect models identify the maternal employment coefficient using only the adolescent observations with a change in their schooling

outcome over time. In Table 6, we report coefficients for the non-linear work hours specification estimated using a logit model and a fixed effect model both on the full sample and the initial analytic sub-sample used for the fixed effects models. We confine our results to the three outcomes for which we find statistically significant coefficients. Our results indicate that both the removal of the fixed effect and the changes in sample composition contribute to the findings.

For example, in the first set of columns we report results from three different models of the “skipped school/class without permission” outcome. In the first column, we report results using the full Urban Change sample (N=1,668) and a logit model with the same specification as reported in Table 2. Neither coefficient is statistically significant. Next, we report results using a logit model with the same specification using a sample that has variation in the outcome (i.e., the analytic sample used for the fixed effect logit model, N=316). The coefficients increase in magnitude and become statistically significant with $\alpha = 0.10$. Since the model is the same for both sets of results, any differences we see must be due to the change in sample composition. In the next column, we remove the fixed effect. Comparing the results in the second and third columns shows that the coefficient for both measures nearly doubles; both are now statistically significant with $\alpha = 0.05$. The only difference in these two sets of results is the model chosen, since the samples are the same. From the logit model to the fixed effect logit model, the coefficient for “works 1 to 30 hours” increases 1.311 and the coefficient for “works > 30 hours” increases 1.008. In this case, we can infer that 52% of the change ($0.683/1.311$) in the “works 1 to 30 hours” is due to sample composition and 48% is due to the removal of the fixed effect. For the “works > 30 hours” variable, 49% is due to sample composition, and the removal of the fixed effect accounts for the remaining change.

In the second set of columns, we report results for a logit model of performance above average. Neither maternal work hours coefficient is statistically significant in the logit model. Next, we report results using a logit model with the sample that has variation in the outcome. The coefficient for worked > 30 hours is -0.530 and statistically significant. Since we have not removed the unobserved time-invariant characteristics in this model, the change in the coefficient is due to the sample composition. In the next set of entries, we remove the fixed effect. The coefficient for “works >30 hours” increases to -0.666 and remains statistically significant. From the logit model to the fixed effect logit model the coefficient estimates changes by 0.588. In this case, 77% of the change observed is due to sample composition and the remaining 23% of the change is due to the fixed effect.

The result for “parent contacted about behavior problems” is similar, although the removal of the fixed effect is relatively more important to the change in the coefficient estimates from the full sample to the fixed effects model than in the “performed above average” results. Fifty-six % of the change in the coefficient estimates for the “works > 30 hours” variable can be attributed to the sample composition and 44% to the removal of the fixed effect.

Simultaneity Bias

In addition to the issues examined above, we also considered the temporal ordering of the maternal work hours measure and the schooling outcomes. The school performance variables were measured contemporaneously, the reference period for the “number of days late” and “number of days missed” variables is the past four weeks, and for the “skipped school/class” and “contacted about behavior problems” variables the reference period is the past 12 months. If mothers change their work hours in response to these factors, then our coefficient estimates

might suffer from simultaneity bias. In other words, a mother may change her work hours in response to schooling outcomes instead of or in addition to the responses we hypothesize.

Though this is a reasonable concern, if such a bias exists then our estimates are probably conservative. For example, consider the coefficient estimate for “parent contacted about behavior problems.” We find that increases in maternal work hours are positive and statistically significantly related to this outcome. If being contacted by the school is altering the mother’s work hours, it would probably reduce the hours she works, not increase them. If this countervailing influence exists, then our estimates should be biased toward zero. A similar argument can be made for the “performed above average in school” and “skipped school/class without permission” models.

Income

Before concluding, we address one potential mechanism that has been noticeably absent throughout this analysis: income. We first highlight a couple of points on this issue that are pertinent to our analysis. Several authors who have studied parental income and its influence on children advocate using the family’s permanent income, which is fixed over time (Mayer 1997; Solon 1992). Since the fixed effects model removes all time-invariant factors, then the maternal employment estimate should not be biased by the omission of permanent income in the model or by any other factor that is constant over time.

Of course, the maternal employment measure may be capturing changes due to the transitory component of income, which is endogenous to our specification. If maternal employment is causing income to change and that income change is influencing the outcome, one would not want to include income in the models as this will over-control for the real effects of maternal work hours. If, however, it is income (or lack thereof) that is causing mothers to

work and income influences the outcome, then excluding income from our model might bias the estimates of maternal work hours. It is, of course, possible that both influences are important.

In a final supplemental analysis (results available upon request), we re-estimated the models presented in Table 3 with total family monthly income at the time of the survey (a combination of earned income, nonearned income such as child support, and cash assistance) included in the model. In general, the coefficient estimates and standard errors for maternal employment are nearly identical to those reported in Table 3, sometimes slightly smaller and sometimes slightly larger, with one exception. The coefficient estimate for work more than 30 hours in the “parent contacted about behavior problems in school” model declines nearly 0.1 and is no longer statistically discernable from zero. These results indicate that for two of the three outcomes the relationship between maternal employment and the schooling outcomes in this low-income population does not derive primarily from the resulting potentially transitory change in economic resources available to a family when a mother works.

DISCUSSION AND CONCLUSIONS

Using a fixed effect approach along with controls for a broad array of time-varying characteristics, we find evidence of unfavorable effects of maternal work hours on 3 of 6 adolescent school participation and performance outcomes. Compared to the adolescents of mothers who were not working, those of mothers who were working 1 to 30 or 31 or more hours respectively were more likely to skip school without permission, whereas only those whose mothers worked 31 or more hours were less likely to perform above average and more likely to exhibit behavior problems that resulted in a call home. In some instances, sons seem to be affected more than daughters by their mothers’ work, with notable increases in incidences of being late for school and decreases in performing above average among boys when mothers

worked more hours. Importantly, supplemental analyses show that the emergence of statistically significant coefficients in the fixed effect models results in part from changes in the analytical sample we rely upon for identifying the fixed effect model (i.e., the sample that has variation over time in our variables of interest) and in part from the reduction of the bias caused by omitted variables. Additionally, supplemental analyses reveal that changes in household income do not account for two of the three maternal employment effects we observe. Both of these caveats should be kept in mind when considering these findings.

The findings from this study generally align with prior research finding neutral to negative effects of welfare and employment policies on adolescent schooling outcomes (Gennetian et al. 2004) and demonstrate that unfavorable effects may exist under considerably different economic and policy conditions than existed prior to the 1996 welfare reforms. The consistency of findings under pre- and post-welfare reform conditions, and across studies with comparably-aged adolescents and measured outcomes, is additionally striking in light of differences in the identification strategy in the two studies; Gennetian et al. (2004) relied on pre-welfare reform program-experimentally induced changes in employment, while the current study identified naturally-occurring changes produced by some combination of policy, local economic conditions, and time-varying personal and family-level characteristics. This study additionally points to effects on school attendance and schooling-related problems that were not available in Gennetian et al. (2004).

The findings in this study appear to differ from those reported in a couple of other recent studies. For example, Chase-Lansdale et al. (2003) find a beneficial effect of maternal transitions into work on adolescent anxiety and psychological distress levels and that transitions off of welfare are associated with increased reading skills among adolescents. Similarly, Ruhm

(2006) finds small benefits of maternal employment on the cognitive development of economically disadvantaged 10 to 11 year olds. Such comparisons are, in our estimation, difficult to make because of a lack of comparability of schooling outcomes, differences in the age groups included in each study, and differences in the assessment periods. In addition, the Chase-Lansdale et al. (2003) study focuses on maternal transitions with a broad differentiation of work hours and the study by Ruhm (2006) focuses on the cumulative effects of employment over the years of a child's early development, rather than the more-nuanced measure of contemporaneous change in maternal work hours that is the focus of the current investigation. Given these differences, it remains unclear to what extent the findings we present are compatible with or contradictory to the findings reported in these other studies.

Although it is beyond the scope of this paper to isolate the potential range of time-invariant, omitted variables that were biasing our initial regression results, we do offer a potential explanatory factor in an attempt to direct future inquiries into this topic. As an illustrative example, consider findings from the "contacted about behavior problems" estimation. In the initial model, the coefficient estimate was positive but not statistically significant. In the fixed effects model, the point estimate for the coefficient more than doubles. One potential omitted variable that would produce such a result is neighborhood context, particularly neighborhood safety. If mothers who work are also living in safer neighborhoods, and neighborhood safety is negatively related to being contacted about problem behavior (perhaps because safer neighborhoods have higher quality schools and fewer negative peer influences), then the omission of neighborhood characteristics could explain the results we see. A similar logic can be applied to the skipping school and school performance outcomes.

As carefully documented in Chase-Lansdale et al. (2002), Gennetian et al. (2004), and Ruhm (2006), the current study indicates that low-income adolescents whose mothers were on welfare are at high risk of school participation and performance problems, as well as other behavioral and emotional problems that might influence their ability to participate and perform well in school. Together, the findings from all of these studies contribute to a growing body of evidence and knowledge about the effects of maternal work hours on this already high-risk group of adolescents. The findings from the current study suggest that low-income adolescents living in neighborhoods of highly concentrated poverty experience some unfavorable effects from their mother's employment in the post-1996 welfare policy and economic context. Although we have not isolated the reasons why such changes in employment occurred—whether because of public policy or because of a variety of other personal or labor market factors—and we cannot speak to whether effects occur across other domains of adolescent development, such as their socio-emotional and physical health, fertility, and work behavior, the findings from this study point to the importance of considering adolescent schooling outcomes in policy debates about welfare, work, income, and out-of-school care. Adolescent-aged children are a group who should not be forgotten in short- and longer-term studies that are designed to better understand the economic condition and behavior of families.

REFERENCES

- Allen, K. and M. Kirby. 2000. *Unfinished Business: Why Cities Matter to Welfare Reform*. Washington, DC: Brookings Institution, Center on Urban and Metropolitan Policy.
- Allesandri, S.M. 1992. "Effects of Maternal Work Status in Single-Parent Families on Children's Perception of Self and Family and School Achievement." *Journal of Experimental Child Psychology* 54: 417-433.
- Aughinbaugh, A. and M. Gittleman. 2004. "Maternal Employment and Adolescent Risky Behavior." *Journal of Health Economics* 23: 815-838.
- Baker, C.O. and D.L. Stevenson. 1986. "Mothers' Strategies for Children's School Achievement: Managing the Transition to High School." *Sociology of Education* 59: 156-166.
- Baumrind, D. 1989. "Rearing Competent Children." Pp. 349-378 in *Child Development Today and Tomorrow*, edited by W. Danon. San Francisco: Jossey-Bass.
- Baumrind, D. 1991. "Parenting Styles and Adolescent Development." Pp. 746-758 in *The Encyclopedia of Adolescence*, edited by J. Brooks-Gunn, R. Lerner, and A.C. Petersen. New York: Garland.
- Becker, G. 1981. *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Becker, G.S. and N. Tomes. 1979. "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility." *Journal of Political Economy* 87: 1153-1189.
- . 1986. "Human Capital and the Rise and Fall of Families." *Journal of Labor Economics* 4: S1-S39.

- Bianchi, S. 2000. "Maternal Employment and Time with Children: Dramatic Change or Surprising Continuity?" *Demography* 37(4): 401-414.
- Blank, R. and R. Haskins (Eds.). 2001. *The New World of Welfare*. Washington, D.C.: The Brookings Institution Press.
- Bogenschneider, K. and L. Steinberg. 1994. "Maternal Employment and Adolescents Academic Achievement: A Developmental Analysis." *Sociology of Education* 67: 60-77.
- Brock, T., C. Coulton, A. London, D. Polit, L. Richburg-Hayes, E. Scott, N. Verma, with I. Kwakye, V. Martin, J. Polyne, and D. Seith. 2002. *Welfare Reform in Cleveland: Implementation, Effects, and Experiences of Poor Families and Neighborhoods*. New York: MDRC.
- Brock, T., I. Kwakye, J.C. Polyné, L. Richburg-Hayes, D. Seith, A. Stepick, and C. Dutton Stepick, with T. Cullen and S. Rich. 2004. *Paying for Persistence: Early Results of a Louisiana Scholarship Program for Low-Income Parents Attending Community College*. New York: Manpower Demonstration Research Corporation.
- Brooks-Gunn, J., G.J. Duncan, and J.L. Aber (Eds.). 1997. *Neighborhood Poverty*. New York: Russell Sage.
- Bryant, W.K. and C.D. Zick. 1996. "Are We Investing Less in the Next Generation? Historical Trends in the Time Spent Caring for Children." *Journal of Family and Economic Issues* 17: 365-392.
- Burton, L., J. L. Brooks, and J. Clark. 2002. "Adultification in Childhood and Adolescence: A Conceptual Model." Working Paper. College Park: The Pennsylvania State University, Center for Human Development and Health and Research in Diverse Contexts.

- Butcher, K. and A. Case. 1994. "The Effect of Sibling Sex Composition on Women's Education and Earnings." *Quarterly Journal of Economics* 109: 531-63.
- Card, D. 1999. "The Causal Effect of Education on Earnings." Pp. 1801-1863 in *Handbook of Labor Economics. Volume 3A*, edited by O. Ashenfelter and D. Card. New York: Elsevier.
- Chamberlain, G. 1980. "Analysis of Covariance with Qualitative Data." *Review of Economic Studies* 47: 225-238.
- Chase-Lansdale, P.L., R. Moffitt, B. Lohman, A. Cherlin, R. Coley, L. Pittman, J. Roff, and E. Votruba-Drzal. 2003. "Mothers' Transition From Welfare to Work and the Well-Being of Preschoolers and Adolescents." *Science* 299(5612): 1548-1552.
- Chase-Lansdale, L. and L. Pittman. 2002. "Welfare Reform and Parenting: Reasonable Expectations." *The Future of Children* 12: 167-185.
- Crouter, A.C., M.R. Head, M.F. Bumpus, and S.M. McHale. 2001. "Household Chores: Under What Conditions Do Mothers Lean on Daughters?" *New Directions for Child and Adolescent Development* 94: 23-41.
- Dodson, L., & Dickert, J. 2004. Girls' Family Labor in Low-Income Households: A Decade of Qualitative Research. *Journal of Marriage & Family* 66: 318-332.
- Duncan, G.J. and J. Brooks-Gunn. 1997. *The Consequences of Growing Up Poor*. NY: Russell Sage.
- Duncan, G.J. and P.L. Chase-Lansdale. 2001. *For Better and For Worse: Welfare Reform and the Well-Being of Children and Families*. NY: Russell Sage.
- Edin, K. and M. Kefalas. 2005. *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Berkeley: University of California Press.

- Eccles, J. S. 1999. "The Development of Children Ages 6 to 14." *The Future of Children* 9: 30-43.
- Fine, M. 2005. *Beyond Silenced Voices: Class, Race, and Gender in United States Schools*. Albany: SUNY Press.
- Gennetian, L.A., G. Duncan, V. Knox, W. Vargas, E. Clark-Kauffman, and A. London. 2004. "How Welfare Policies Affect Adolescents' School Outcomes: A Synthesis of Evidence From Experimental Studies." *Journal of Research on Adolescence* 14: 399-423.
- Hao, Lingxin, Nan M. Astone and Andrew J. Cherlin. 2004. "Adolescents' School Enrollment and Employment: Effect of State Welfare Policies." *Journal of Policy Analysis and Management* 23: 697-721.
- Hofferth, S. L., J. Smith, V. C. McCloyd, and J. Finkelstein. 2000. "Achievement and Behavior Among Children of Welfare Recipients, Welfare Leavers, and Low-Income Single Mothers." *Journal of Social Issues* 56: 747-774.
- Hsueh, J. and L.A. Gennetian. 2006. *Welfare Policies and Adolescents: Exploring Work Schedules, Economic Resources and Sibling Care*. Manuscript.
- Kalil, A., R. Dunifon, and S. K. Danziger. 2001. "Are Children's Behavior Problems Affected by Their Mothers' Work Participation Since Welfare Reform?" Pp. 154-178 in *For Better or for Worse: Welfare Reform and Children's Well-Being*, edited by G. J. Duncan & P. L. Chase-Lansdale. New York: Russell Sage Foundation.
- Kalil, A., and K. M. Ziol-Guest. 2005. "Single Mothers' Employment Dynamics and Adolescent Well-Being." *Child Development* 76: 196-211.

- Kerr, M. and H. Stattin. 2000. "What Parents Know, How They Know it, and Several Forms of Adolescent Adjustment: Further Support for a Reinterpretation of Monitoring." *American Psychological Association* 36: 366-380.
- Kozol, J. 1991. *Savage Inequalities: Children in America's Schools*. NY: Crown Publishers, Inc.
- Kurz, D. 2002. "Poor Urban Mothers and the Care of Teenage Children." Pp. 232-236 in *Child Care and Inequality: Re-Thinking Child Care for Children and Youth*, edited by F. Cancian, D. Kurz, A. London, R. Reviere, and M. Tuomenin. New York: Routledge.
- Lareau, A. 2003. *Unequal Childhoods: Class, Race, and Family Life*. Berkeley: University of California Press.
- London, A. S., E. K. Scott, and V. Hunter 2002. "Health-Related Carework for Children in the Context of Welfare Reform." Pp. 99-112 in *Child Care and Inequality: Re-Thinking Carework for Children and Youth*, edited by F. Cancian, D. Kurz, A. S. London, R. Reviere, and M. Tuominen. New York: Routledge.
- London, A. S., E. K. Scott, K. Edin, and V. Hunter. 2004. "Welfare Reform, Work-Family Tradeoffs, and Child Well-Being." *Family Relations* 53: 148-158.
- Lopoo, L. M. 2004. "The Effect of Maternal Employment on Teenage Childbearing." *Journal of Population Economics* 17: 681-702.
- . 2005. "Maternal Employment and Teenage Childbearing: Evidence From the PSID." *Journal of Policy Analysis and Management* 24: 23-46.
- MacLeod, J. 1995. *Ain't No Makin' It: Aspirations and Attainment in a Low-Income Neighborhood*. Boulder, CO: Westview Press.

- Massey, D.S., A.B. Gross, and K. Shibuya. 1994. "Migration, Segregation, and the Geographic Concentration of Poverty." *American Sociological Review* 59:425-45.
- Mayer, S. 1997. *What Money Can't Buy: Family Income and Children's Life Chances*. Cambridge, MA: Harvard University Press.
- McCloyd, V.C. 1990. "The Impact of Economic Hardship in Black Families and Children: Psychological Distress, Parenting, and Socioemotional Development." *Child Development* 61: 311-346.
- McCloyd, V.C., T.E. Jayartne, R. Ceballo, and J. Borquez 1994. "Unemployment and Work Interruption Among African-American Single Mothers: Effects on Parenting and Adolescent Socioemotional Functioning." *Child Development* 65: 562-589.
- Menaghan, E.G. and T. L. Parcel. 1995. "Social Sources of Change in Children's Home Environments: The Effects of Parental Occupational Experiences and Family Conditions." *Journal of Marriage and the Family* 57: 69-84.
- Michalopoulos, C., K. Edin, B. Fink, M. Landriscina, D.F. Polit, J.C. Polyne, L. Richburg-Hayes, D. Seith, N. Verma. 2003. *Welfare Reform in Philadelphia: Implementation, Effects, and Experiences of Poor Families and Neighborhoods*.
- Milkie, M. A., M. J. Mattingly, K. M. Namaguchi, S. M. Bianchi, J. P. Robinson. 2004. "The Time Squeeze: Parental Statuses and Feelings About Time with Children." *Journal of Marriage and Family* 66: 739-761.
- Moore, K. A., and A. Driscoll. 1997. "Low-Wage Maternal Employment and Outcomes for Children: A Study." *The Future of Children* 7: 122-127.
- Morris, P., A. Huston, G. Duncan, D. Crosby, and H. Bos. 2001. *How Welfare and Work Policies Affect Children: A Synthesis of Research*. New York: MDRC.

- Parcel, T. L., and E. G. Menaghan. 1994. *Parents' Jobs and Children's Lives*. New York: Aldine de Gruyter.
- Parrott, S., L. Schott, E. Sweeney, A. Baider, E. Ganzglass, M. Greenberg, E. Minoff, and V. Turetsky. 2006. *Implementing the TANF Changes in the Deficit Reduction Act: "Win-Win" Solutions for Families and States*. Washington, D.C.: Center for Law and Social Policy.
- Polit, D.F., A.S. London, and J.M. Martinez. 2001. *The Health of Poor Urban Women: Findings From the Project on Devolution and Urban Change*. New York: Manpower Demonstration Research Corporation.
- Polit, D.F., L. Nelson, L. Richburg-Hayes, and D.C. Seith, with S. Rich. 2005. *Welfare Reform in Los Angeles: Implementation, Effects, and Experiences of Poor Families and Neighborhoods*. New York: Manpower Demonstration Research Corporation.
- Radloff, L. S. 1977. "The CES-D Scale: A Self-Report Depression Scale for Use in the General Population." *Applied Psychological Measurement* 1: 385-401.
- Ruhm, C.J. 2006. "Maternal Employment and Adolescent Development." NBER Working 10691 (dated 2004). Cambridge, MA. Revised version available at <http://www.uncg.edu/bae/people/ruhm>. Accessed June 15, 2007.
- Sampson, R.J. and J.H. Laub. 1994. "Urban Poverty and the Family Context of Delinquency: A New Look at Structure and Process in a Classic Study." *Child Development* 65: 523-540.
- Scott, E. K., K. Edin, A. S. London, and R. Joyce Kissane. 2004. "Unstable Work, Unstable Income: Implications for Family Well-Being in the Era of Time-Limited Welfare." *Journal of Poverty* 8: 61-88.
- Scott, E.K., A.S. London, and A. Hurst. 2005. "Instability in Patchworks of Child Care When Moving from Welfare to Work." *Journal of Marriage and the Family* 67: 369-385.

- Solon, G. 1992. "Intergenerational Income Mobility in the United States." *American Economic Review* 82: 393-408.
- U.S. Department of Education. 2005. Digest of Education Statistics: 2005. Institute for Educational Science, National Center for Educational Statistics
(nces.ed.gov/programs/digest).
- Waldfogel, J., W. Han, and J. Brooks-Gunn. 2002. "The Effects of Early Maternal Employment on Child Development." *Demography* 39: 39-392.
- Ware, J. E., M. Kosinski, and S. D. Keller. 1996. "A 12-Item Short-Form Health Survey." *Medical Care* 34:220-233.
- Weigt, J. 2006. "Compromises to Carework: The Social Organization of Mothers' Experiences in the Low-Wage Labor Market after Welfare Reform." *Social Problems* 53: 332-351.
- Wilson, W. J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago, IL: University of Chicago Press.
- Zaslow, M., M. A. McGroder, and K. A. Moore. 2000. *National Evaluation of Welfare-to-Work Strategies: Impacts on Young Children and Their Families Two Years After Enrollment* (Summary Report). Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families and Office of the Assistant Secretary for Planning and Evaluation, and U.S. Department of Education.
- Zick, C.D., W.K. Bryant, and E. Osterbacka. 2001. "Mothers' Employment, Parental Involvement, and the Implications of Intermediate Child Outcomes." *Social Science Research* 30: 25-49.

Table 1
Schooling Outcomes of Low-Income Youth, Descriptive Statistics of the Sample^a

Variable	Wave 1 1998		Wave 2 2001		Full Analysis Sample	
	Mean	SD	Mean	SD	Mean	SD
<u>Maternal employment in survey month</u>						
Average weekly hours	17.7	21.0	23.6	22.0	20.3	21.6
% Worked \leq 30 hours	13.4		14.1		13.7	
% Worked > 30 hours	34.2		45.9		39.3	
<u>Child outcomes</u>						
Number of days late for school in past 4 weeks	1.4	2.6	1.9	3.1	1.6	2.8
Number of days missed school in past 4 weeks	2.0	2.9	2.0	3.0	2.0	2.9
% Skipped school/class w/o permission	14.0		23.3		18.0	
% Performed above average in school	49.9		55.4		52.3	
% Performed below average in school	19.7		16.3		18.2	
% Parent contacted about behavior problems in school	43.5		36.6		40.5	
<u>Characteristics of children</u>						
% Male	49.8		50.0		49.9	
Age	13.4	1.2	15.9	1.1	14.5	1.7
<u>Characteristics of mothers</u>						
Age	36.1	5.0	38.6	5.0	37.2	5.2
% No high school degree or equivalent	48.3		43.4		46.2	
% Currently married	8.3		14.9		11.2	
% Currently cohabiting	9.6		12.1		10.7	
CES-D score ^b	17.9	11.3	16.2	10.5	17.2	11.0
% With health limitation	25.5		24.3		25.0	
SF-12 Physical Component Score ^c	46.2	9.9	46.0	10.2	46.1	10.0
% Physically abused (past year)	8.3		4.5		6.6	
% Emotionally abused (past year)	40.3		26.1		34.1	
% Used hard drugs (past 30 days)	2.4		2.0		2.2	
% Born in the US	78.8		78.1		78.5	
% Black ^d	68.9		68.8		68.9	
% Hispanic	25.0		25.6		25.2	
% White	4.5		3.9		4.3	
% Other	1.6		1.6		1.6	
<u>Characteristics of household</u>						
% With "other" adult in household ^e	24.0		26.4		25.0	
% With "other" children in household ^f	10.0		14.6		12.0	
Total number of children in household	3.1	1.6	3.1	1.6	3.1	1.6
Total sample size (OLS)	958		740		1,698	
Total number of children	958		740		958	

NOTES: SD = standard deviation, OLS = ordinary least squares regression

^a The sample is children aged 12 to 18 at wave 1 and less than 19 at wave 2.

^b CES-D = Center for Epidemiologic Studies Depression Scale; Scores can range in value from 0-60. A score above 23 is considered an indicator of a high risk of depression.

^c SF-12 is a health survey with 12 questions designed to measure mental and physical health. Physical component scores have been standardized in a national sample to a mean of 50 and a standard deviation of 10.

^d Excluded base category.

^e Other than mother, spouse, or cohabitating partner.

^f Other than respondent's own or adopted children.

Table 2
Estimates of the Effects of Average Maternal Work Hours on Adolescent School Participation and Performance Outcomes

Outcomes	OLS	FE	Logit	FE Logit
Number of days late for school	0.002	-0.002		
SE:	(0.004)	(0.006)		
N:	1,423	1,030		
Number of days missed school	-0.001	0.008		
SE:	(0.004)	(0.006)		
N:	1,452	1,076		
Skipped school/class w/o permission			0.003	0.024 ***
SE:			(0.004)	(0.009)
ME:			[0.000]	[0.004]
N:			1,668	316
Performed above average in school			-0.002	-0.015 **
SE:			(0.003)	(0.006)
ME:			[-0.001]	[-0.004]
N:			1,691	476
Performed below average in school			0.000	0.000
SE:			(0.003)	(0.007)
ME:			[0.000]	[0.000]
N:			1,691	310
Parent contacted about behavior problems			0.004	0.011 **
SE:			(0.003)	(0.006)
ME:			[0.001]	[0.003]
N:			1,695	530

NOTES: OLS = ordinary least squares regression; FE = fixed effects; Logit/ FE logit models used to predict the dichotomous outcomes.

Statistical significance levels are indicated at * p<.10; ** p<.05; *** p<.01.

Standard errors (SE) are in parentheses; the cluster option was used in all of these models to adjust standard errors for the lack of independence between observations (multiple observations per child).

Marginal effects (ME) are in brackets; the formula is: $\frac{\partial P}{\partial EMP} = P*(1-P)*\gamma_1$.

The following controls are included: child's sex and age, mother's age, educational attainment, the number of children in the household, CES-D score, and indicators for: marital and cohabitation status, race/ethnicity, sf-12 physical health component score, whether or not a health condition limits the mother's ability to work, whether or not the mother was born in the US, whether or not the mother has recently been physically abused, emotionally abused, or has used hard drugs, the presence of another adult in the household, the presence of a child other than the mother's own/adopted child, the respondent's location either Los Angeles, Miami, or Philadelphia, a set of interactions between each site indicator and the Hispanic indicator, and a set of interactions between the site indicators and whether or not the mother was born in the U.S. indicator. Also included are indicators flagging missing values for each of the covariates.

Table 3**Fixed Effects Estimates of the Effects of Full and Part Time Work on Adolescent Schooling Outcomes**

Variable	Number of Days Late for School	Number of Days Missed School	Skipped School/Class w/o Permission	Performed Above Average in School	Performed Below Average in School	Parent Contacted About Behavior Problems in School
Worked 1 to 30 hrs	-0.129	-0.056	1.369 **	-0.334	0.717	-0.347
SE:	(0.347)	(0.338)	(0.639)	(0.339)	(0.459)	(0.324)
ME:			[0.202]	[-0.083]	[0.107]	[-0.084]
Worked > 30 hrs	-0.121	0.518	1.082 **	-0.666 **	0.020	0.589 **
SE:	(0.299)	(0.322)	(0.505)	(0.270)	(0.343)	(0.295)
ME:			[0.160]	[-0.166]	[0.003]	[0.142]

NOTES: FE logit models were used to predict the dichotomous outcomes.

Statistical significance levels are indicated at * p<.10; ** p<.05; *** p<.01.

Standard errors (SE) are in parentheses. The cluster option was used in all of these models to adjust standard errors for the lack of independence between observations (multiple observations per child).

Marginal effects (ME) are in brackets; the formula is: $\frac{\partial P}{\partial EMP} = P * (1 - P) * \gamma_1$.

The following controls are included: child's sex and age, mother's age, educational attainment, the number of children in the household, CES-D score, and indicators for: marital and cohabitation status, race/ethnicity, sf-12 physical health component score, whether or not a health condition limits the mother's ability to work, whether or not the mother was born in the US, whether or not the mother has recently been physically abused, emotionally abused, or has used hard drugs, the presence of another adult in the household, the presence of a child other than the mother's own/adopted child, the respondent's location - either Los Angeles, Miami, or Philadelphia, a set of interactions between each site indicator and the Hispanic indicator, and a set of interactions between the site indicators and whether or not the mother was born in the U.S. indicator. Also included are indicators flagging missing values for each of the covariates.

Table 4

Fixed Effects Estimates of the Effects of Work Hours Interacted with Adolescent Sex on Schooling Outcomes

Variable	Number of Days Late for School	Number of Days Missed School	Skipped School/Class w/o Permission	Performed Above Average in School	Performed Below Average in School	Parent Contacted About Behavior Problems in School
Worked 1 to 30 hrs	-0.691	-0.416	0.494	0.290	-0.469	-0.933 *
SE:	(0.496)	(0.494)	(1.445)	(0.548)	(0.916)	(0.518)
ME:			[0.073]	[0.072]	[-0.07]	[-0.225]
Worked > 30 hrs	-0.698	0.453	1.527 **	-0.259	-0.397	0.207
SE:	(0.425)	(0.458)	(0.678)	(0.356)	(0.545)	(0.365)
ME:			[0.225]	[-0.065]	[-0.060]	[0.05]
Worked 1 to 30 hrs x Male	1.177 *	0.723	1.347	-1.119 *	1.609	1.012
SE:	(0.696)	(0.669)	(1.781)	(0.677)	(1.121)	(0.676)
ME:			[0.199]	[-0.279]	[0.240]	[0.244]
Worked > 30 hrs x Male	1.245 **	0.122	-0.926	-0.850	0.645	0.832
SE:	(0.591)	(0.609)	(1.049)	(0.534)	(0.702)	(0.586)
ME:			[-0.137]	[-0.212]	[0.096]	[0.200]

NOTES: FE logit models were used to predict the dichotomous outcomes.

Statistical significance levels are indicated at * p<.10; ** p<.05; *** p<.01.

Standard errors (SE) are in parentheses. The cluster option was used in all of these models to adjust standard errors for the lack of independence between observations (multiple observations per child).

Marginal effects (ME) are in brackets; the formula is: $\frac{\partial P}{\partial EMP} = P * (1 - P) * \gamma_1$.

The following controls are included: child's sex and age, mother's age, educational attainment, sf-12 physical health component score, CES-D score, the number of children in the household, and indicators for: marital and cohabitation status, race/ethnicity, whether or not a health condition limits the mother's ability to work, whether or not the mother was born in the U.S., whether or not the mother has recently been physically abused, emotionally abused, or has used hard drugs, the presence of another adult in the household, the presence of a child other than the mother's own/adopted child, the respondent's location, a set of interactions between each site location and the Hispanic indicator, and a set of interactions between the site locations and an indicator for born in the U.S. Also included are indicators flagging missing values for each of the covariates.

Table 5**Changes in Maternal Work Hours Across Survey Waves**

	Wave 2 (2001)			Employment	N
	0 Hours	1-30 Hours	31+ Hours	Status Wave 1 (Row Total)	
Wave 1 (1998)					
0 Hours	0.57	0.15	0.28	0.52	380
1-30 Hours	0.24	0.25	0.51	0.13	95
31+ Hours	0.20	0.09	0.72	0.35	256
Total				1.00	731

Table 6

Comparing Logit and FE Logit using Full- and Sub-Samples with Outcome Variation for Selected Schooling Outcomes

Variable	Skipped School/Class w/o Permission			Performed Above Average in School			Parent Contacted About Behavior Problems		
	FE Logit		FE Logit	FE Logit		FE Logit	FE Logit		FE Logit
	Full Sample	Sub-Sample	Sub-Sample	Full Sample	Sub-Sample	Sub-Sample	Full Sample	Sub-Sample	Sub-Sample
	Logit		FE Logit	Logit		FE Logit	Logit		FE Logit
Worked 1 to 30 hrs	0.058	0.741 *	1.369 **	-0.178	-0.326	-0.334	0.129	-0.176	-0.347
SE:	(0.212)	(0.420)	(0.639)	(0.165)	(0.297)	(0.339)	(0.167)	(0.299)	(0.324)
ME:	[0.009]	[0.109]	[0.202]	[-0.044]	[-0.080]	[-0.083]	[0.031]	[-0.042]	[-0.084]
Worked > 30 hrs	0.074	0.570 *	1.082 **	-0.078	-0.530 **	-0.666 **	0.128	0.385 **	0.589 **
SE:	(0.212)	(0.330)	(0.505)	(0.127)	(0.210)	(0.270)	(0.126)	(0.196)	(0.295)
ME:	[0.011]	[0.084]	[0.160]	[-0.019]	[-0.132]	[-0.166]	[0.031]	[0.093]	[0.142]
N:	1,668	316	316	1,691	476	476	1,695	530	530

NOTES: Logit/ FE logit models used to predict the dichotomous outcomes.

Statistical significance levels are indicated at * p<.10; ** p<.05; *** p<.01.

Standard errors (SE) are in parentheses. The cluster option was used in all of these models to adjust standard errors for the lack of independence between observations (multiple observations per child).

Marginal effects (ME) are in brackets; the formula is: $\frac{\partial P}{\partial EMP} = P*(1-P)*\gamma_1$

The following controls are included: child's sex and age, mother's age, educational attainment, the number of children in the household, CES-D score, and indicators for: marital and cohabitation status, race/ethnicity, sf-12 physical health component score, whether or not a health condition limits the mother's ability to work, whether or not the mother was born in the US, whether or not the mother has recently been physically abused, emotionally abused, or has used hard drugs, the presence of another adult in the household, the presence of a child other than the mother's own/adopted child, the respondent's location - either Los Angeles, Miami, or Philadelphia, a set of interactions between each site indicator and the Hispanic indicator, and a set of interactions between the site indicators and whether or not the mother was born in the U.S. indicator. Also included are indicators flagging missing values for each of the covariates.

The fixed effects analyses are identified from respondents who experience a change in the outcome from wave 1 to wave 2. Units of observations without variation in the outcome over time are excluded from these analyses. Please see text for details.

APPENDIX

The analysis sample in this study represents a sub-sample of those adolescents who were enumerated as being present in the households of women in the 1998 (wave 1) Urban Change survey. Here we document the reasons why some children were not included in the analyses. As seen in Appendix Table 1, of the 1,691 focal B children in the data set, 733 adolescent children were excluded in wave 1 and 951 adolescent children were excluded from wave 2. The most common reason is that they were older than 18 years by the time of the 2001 (wave 2) survey (N=411) and no longer met the inclusion criteria for the study (i.e., the child must have been 12-18 years old in 1998 and no older than 18 years in 2001). Of those who were age-eligible in 2001 (N=1,280), an additional 536 were excluded from the longitudinal analysis (the analysis used for the fixed effects models) for one of three reasons. The first reason is survey non-response; a total of 286 mothers were not re-interviewed in 2001 (excluded group #1). The second reason is that the children were not living with their mothers at the time of the 2001 survey (excluded group #2). A total of 125 children were excluded either because the mother reported that she had no children living with her (N=32), the mother reported that the age-eligible adolescent child, specifically, was no longer living in her household (N=86), or the mother reported that the age-eligible adolescent child was deceased (N=7). An additional 125 children were excluded because the age-eligible child was no longer in school, either because they had graduated by age 18 years or they had dropped out of school (excluded group #3). Finally, four adolescents were excluded because we could not determine their age at the wave 2 survey, and we were unsure if they met the sample selection criteria.

Although most of the longitudinal school participation and performance outcomes are missing for the groups of adolescents who were excluded in the study, we were able to compare

these adolescents to the adolescents in the analysis sample using other survey outcomes and characteristics of the children and their mothers. Appendix Table 2 shows that all of the groups of children excluded from the wave 2 survey sample were more likely to have dropped out of school and to have had or fathered a baby.¹¹ In addition, excluded group 1 and 2 were more likely to have ever been in trouble with the police than the children in the study analysis sample at wave 2.¹² Children excluded because they were no longer living with their mothers or because they were no longer in school also had mothers that were more likely to be depressed and to be emotionally, psychologically, or physically abused.

These results provide some evidence that children in the worst circumstances and with the poorest outcomes were ineligible for inclusion in the analysis sample. This suggests that the analysis sample represents a slightly better-off or less at-risk sample of adolescents and that our findings of unfavorable effects of maternal employment on adolescent school participation and performance over time might be conservative estimates.

¹¹ We did not construct an extra excluded group category for the four cases in which age in wave 2 was unknown due to the small sample size.

¹² As noted previously, we excluded from our analysis the ever repeat a grade, ever drop out of school, and ever suspended/expelled because these outcomes do not have a discrete reference period, and thus, we could not determine whether these outcomes changed before or after the maternal employment variable was measured.

Schooling Outcomes of Low-Income Youth: The Role of Maternal Work Hours

Appendix Table 1

Criteria to be Eligible for Cross-Sectional Analysis Sample

	Wave 1	Wave 2	Group of Interest
Total focal B children:	1,691	1,691	
- Children older than 18 by wave 2	(411)	(411)	Age-ineligible Group
- Children whose families were not re-interviewed at wave 2	(286)	(286)	Excluded Group # 1
- Children whose mothers said they had 0 children living with them	(3)	(32)	Excluded Group # 2
- Children whose mothers said focal B child was not living with them	(14)	(86)	Excluded Group # 2
- Children who were deceased	(5)	(7)	Excluded Group # 2
- Children not currently in school ^a	(9)	(125)	Excluded Group # 3
- Children missing all outcomes for unknown reasons	(1)		
- Children missing age in wave 2	(4)	(4)	
	958	740	
Total child-year observations:	1,698		

NOTE: ^a When the mother was asked what the child's current grade in school was, these children fell into 1 of the following categories: 1) HS grad or got GED, 2) in college, 3) not in school, 4) in a GED or ABE program, or 5) refused, I don't know. The Focal B schooling outcomes were then skipped for these children. Please note that we do not know how many children in excluded groups 1 and 2 fell into these groups as these children skipped this question.

Schooling Outcomes of Low-Income Youth: The Role of Maternal Work Hours

Appendix Table 2

Comparison of Means for Wave 2 Analysis Sample and Children Excluded from Sample^a

Variable	Comparison of Characteristics Measured at Wave 1		Comparison of Characteristics Measured at Wave 2		
	Wave 2 Analysis Sample	Excluded Group #1 ^b	Wave 2 Analysis Sample	Excluded Group #2 ^c	Excluded Group #3 ^d
Child outcomes					
% Ever repeat a grade	23.1	22.9	28.0	24.5	38.9 **
% Ever drop out of school	3.0	11.9 ***	2.1	24.4 ***	46.0 ***
% Ever suspended/expelled from school	30.8	29.3	33.5	42.9 *	39.8
% Ever had/fathered baby	0.7	5.6 ***	5.0	16.7 ***	19.4 ***
% Ever in trouble w/police	5.3	9.9 **	12.8	26.2 ***	15.3
Number of days late for school	1.2	0.8 ***			
Number of days missed school	1.7	1.8			
% Skipped school/class w/o permission	9.9	15.2 **			
School performance (scale 1-5)	3.6	3.5			
% Performed above average in school	52.8	50.0			
% Performed below average in school	16.7	16.9			
% Parent contacted about behavior problems	42.2	43.7			
Characteristics of children					
% Male	50.0	51.7	50.0	52.8	47.2
Age	13.6	15.0 ***	16.4	17.3 ***	18.1 ***
Characteristics of mothers					
Age	35.8	36.9 ***	38.6	38.7	40.9 ***
% No high school degree or equivalent	48.1	48.6	43.4	47.2	46.4
% Currently married	8.3	11.5	15.0	13.1	16.3
% Currently cohabiting	9.6	6.6	12.1	13.7	10.4
CES-D score ^e	17.6	17.0	16.2	18.9 **	18.3 *
% With health limitation	23.1	26.6	24.3	27.6	28.8
SF-12 Physical Component Score ^f	46.8	45.9	46.1	45.5	44.4
% Physically abused (past year)	7.3	9.7	4.3	8.6	9.5 *
% Emotionally abused (past year)	39.4	33.3 *	25.2	34.2 *	42.3 ***
% Used hard drugs (past 30 days)	1.8	2.6	1.9	4.3	1.8
% Born in the US	78.1	75.2	78.1	80.0	77.6
% Black	68.8	61.9 **	68.8	69.6	64.8
% Hispanic	25.6	30.1	25.6	25.6	26.4
% White	3.9	6.3	3.9	3.2	8.0
% Other	1.6	1.7	1.6	1.6	0.8
Total number of children	740	286	740	125	125

NOTES: Statistical significance levels are indicated at * p<.10; ** p<.05; *** p<.01.

^aThe sample is children aged 12 to 18 at wave 1 and less than 19 at wave 2.

^bChildren missing from the sample because of survey non-response. Because we do not have any wave 2 data for these children or their families, comparisons were made to the analysis sample using wave 1 data.

^cChildren whose families were re-interviewed at wave 2, but who are missing from the wave 2 sample because they were not living with their mother at wave 2 (we do not know if they were in school).

^dChildren whose families were re-interviewed at wave 2, and who lived with their mother at wave 2, but who are missing from the wave 2 sample because they were not in school at wave 2.

^eCES-D = Center for Epidemiologic Studies Depression Scale; Scores can range in value from 0-60. A score above 23 is considered an indicator of a high risk of depression.

^fSF-12 is a health survey with 12 questions designed to measure mental and physical health. Physical component scores have been standardized in a national sample to a mean of 50 and a standard deviation of 10.