

## Employment Patterns of Less-Skilled Workers: Links to Children's Behavior and Academic Progress

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**Abstract** Using data from five waves of the Women's Employment Survey (WES; 1997–2003), we examine the links between low-income mothers' employment patterns and the emotional behavior and academic progress of their children. We find robust and substantively important linkages between several different dimensions of mothers' employment experiences and child outcomes. The pattern of results is similar across empirical approaches—including ordinary least squares and child fixed-effect models, with and without an extensive set of controls. Children exhibit fewer behavior problems when mothers work and experience job stability (relative to children whose mothers do not work). In contrast, maternal work accompanied by job instability is associated with significantly higher child behavior problems (relative to employment in a stable job). Children whose mothers work full-time and/or have fluctuating work schedules also exhibit significantly higher levels of behavior problems. However, full-time work has negative consequences for children only when it is in jobs that do not require cognitive skills. Such negative consequences are completely offset when this work experience is in jobs that require the cognitive skills that lead to higher wage growth prospects. Finally, fluctuating work schedules and full-time work in non-cognitively demanding jobs are each strongly associated with the probability that the child will repeat a grade or be placed in special education.

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## Introduction

The past 15 years have registered unprecedented increases in the employment rates and work hours of low-income single mothers. These phenomena were due in large part to the combined effects of (1) the 1996 welfare reform enactment of time limits on, and work requirements for, the receipt of cash assistance; (2) significant expansions of work supports (most notably, the Earned Income Tax Credit (EITC) and child care subsidies) and; (3) the implementation of these policy reforms during a period of sustained economic growth and historically low unemployment rates. However, many working single mothers experience job instability, inflexible work schedules, and limited wage growth opportunities.

This article investigates whether and how mothers' employment patterns are associated with child development in a sample of low-income single mothers in Michigan who were part of the Women's Employment Study (WES). WES mothers were studied over the period 1997–2003, years during which dramatic changes in welfare policies were implemented and large numbers of women left welfare for work. At each of five in-person surveys, mothers provided in-depth information about their employment, income, and program participation; their children's development; and a host of demographic and personal characteristics. We consider several aspects of maternal employment, including job instability and mobility as well as work intensity and regularity of work hours and schedules, and relate these factors to children's behavior problems and academic progress.

## Theoretical Perspectives

Maternal employment patterns may influence child development through a variety of mechanisms. The conceptual starting point of this analysis is to ask how maternal employment patterns might be associated with parental resource allocation of time, financial, and other investments in children.

Mothers' employment patterns may be associated with both the quality and quantity of children's time with parents, key ingredients in healthy development (Shonkoff and Phillips 2000). Maternal work hours likely predict the quantity of time mothers spend with children. Increased work involvement may lead to greater future promotion prospects for mothers but may also impose a burden on her time, resulting in poorer supervision or care of her children and less time available to provide emotional support or foster the child's involvement in activities. Time-diary data confirm that working reduces the time mothers spend with children, although research suggests that mothers protect quality time with children by cutting back the least on activities directly engaging children (Bianchi 2000; Sandberg and Hofferth 2001). If children whose mothers work more intensively spend more time unsupervised and experience fewer and lower-quality parent-child interactions, then those children may exhibit worse behavioral outcomes. For example, Aizer (2004) shows that lack of after-school supervision of adolescents is associated with behavior problems and criminal activity.

Other aspects of maternal employment may be linked with the quality of time spent with children. For example, parental stress associated with employment instability (either job loss or unpredictable work hours) could reduce the quality and/or quantity of parental time devoted to children (Conger and Elder 1994; McLoyd et al. 1994). The parental stress that often accompanies economic hardship can lead to less nurturing and harsher parenting, which, in turn, may negatively affect children's socioemotional development (Conger and Elder 1994; McLoyd et al. 1994). For low-income women leaving welfare, the stress of meeting strict work requirements could also lead to increases in child maltreatment (Paxson and Waldfogel 2003).

Unanticipated job loss may also result in increased incidence of housing instability, and food insecurity, as well as reduced parental expenditures on child-related investments that are critical for successful child development. Job losses leading to residential moves that disrupt established routines and interfere with existing social networks and supports may, in turn, negatively affect child adjustment and behavior (Adam and Chase-Lansdale 2002; Hanushek et al. 2004; McLanahan 1983).

Work experiences may also influence children through their child care arrangements. Job instability is associated with volatility in nonparental child care arrangements (Lowe et al. 2003; Miller 2005). Similarly, fluctuating work hours may make it difficult for women to secure stable child care. Prior research provides suggestive evidence that children who experience changes in child care arrangements tend to exhibit more behavior problems, lower cognitive and language skills, and less attachment security than those in stable care (Morrissey 2009; NICHD Early Child Care Research Network 1999; Tran and Weinraub 2006; Youngblade 2003).

These perspectives suggest that maternal employment patterns—including number and consistency of work hours, job stability, and job characteristics—may be associated with children's development through a variety of channels. These include the family economic circumstances, the quality and quantity of mothers' time with children, and children's experiences in child care and other out-of-home environments.

## Related Studies

The associations between maternal employment and child development have been widely studied in the fields of economics, psychology, and sociology. Key reviews include Korenman and Kaestner (2005), Smolensky and Gootman (2003), Blau and Currie (2004), Ruhm (2004), and Haveman and Wolfe (1995). Yet, the evidence is inconclusive, as demonstrated in papers reporting effects that range from positive to negative and that are often either insignificant or vary depending on the group studied (Han et al. 2001; James-Burdumy 2005; Parcel and Menaghan 1994; Ruhm 2008; Vandell and Ramanan 1992; Waldfogel et al. 2002).

One potential explanation for the wide range of estimates reported across previous studies is that the impacts of maternal employment on child well-being may well depend on the nature and pattern of that employment (e.g., job quality, job stability versus instability, upward mobility versus employment in dead-end jobs), the number and regularity of hours worked, and the flexibility of work schedule. Few studies have considered these more nuanced dimensions of maternal employment.

Another important source of the divergence of estimates across studies stems from the mixed degree of success in adequately addressing the endogeneity of maternal employment patterns. The main methodological hurdle that any research in this area encounters arises from the fact that (1) mothers who work may differ systematically from those who do not in observable and unobservable ways, and (2) the child's cognitive and behavioral development may influence the mother's decision to work. Differences in children's outcomes are the result of myriad factors, many of which may be correlated with maternal employment patterns. Neglecting to control for these other factors may lead to a biased estimate (upward or downward) of the causal link between maternal employment and child well-being.

Only a handful of studies have attempted to address these endogeneity issues by including an unusually extensive set of controls and/or estimating fixed-effect models. As discussed in the Methods section, we pursue both strategies in this article. A related set of studies (see Duncan et al. 2007; Gennetian and Miller 2002; Gennetian et al. 2004; Hill et al. 2010) exploited randomization to welfare programs that increased maternal employment, although these papers were less successful at understanding the effects of specific characteristics of maternal employment on child well-being.

Among the notable studies that can be classified as using an extensive set of observable characteristics of the child and the mother as controls are Ruhm (2004), Parcel and Menaghan (1994), Baydar and Brooks-Gunn (1991), and Vandell and Ramanan (1992). The results of these papers vary substantially. For example, Ruhm (2004) found significant *negative* effects of maternal employment on math scores, whereas Parcel and Menaghan (1994) reported small *positive* effects of maternal employment on child's cognitive outcomes. Baydar and Brooks-Gunn (1991) found that maternal employment in the child's first year *negatively* affects cognitive outcomes, whereas Vandell and Ramanan (1992) found *positive* effects of early maternal employment on math achievement and of current maternal employment on reading achievement.

Experimental evidence from low-income samples also reveals mixed effects of maternal employment on children's behavior and school performance. Results from the evaluation of the Minnesota Family Investment Program (MFIP) indicated improvements in school performance and reductions in behavior problems among young children when mothers left welfare for work (Gennetian and Miller 2002). Young children of mothers assigned to the work-promoting New Hope program also showed school and behavior improvements both five and eight years later (Duncan et al. 2007). A consistent finding across these and other experimental programs is that maternal employment improved school performance and behavior for young children, yet it often had the opposite effect on teenagers (Gennetian et al. 2004). One limitation of these studies is that they cannot separate the effects on children of leaving welfare *per se* from the effects of increases in work involvement, which is a potentially important distinction.

A recent exception is Hill et al. (2010), who combined experimental data and an instrumental variables approach to examine relations between maternal job loss and children's classroom behavior. These authors exploited exogenous variation in maternal employment patterns produced by an experimental welfare-to-work program and found that maternal job loss sharply increases children's problem behavior.

Yet, this study and most other experimental evidence predates the post-1996 welfare reform period, and so it is less clear how generalizable those findings are in a more recent economic context.

Most studies of maternal employment and child development focus on mothers' work hours (i.e., part-time versus full-time versus not working at all). Until recently, research in this area had not examined the issue of "nonstandard" work, defined to include work schedules that occur outside the typical daytime hours and work schedules that change substantially from day to day or week to week. Over 40% of mothers ages 18–43 who lack postsecondary education work nonstandard schedules (Presser and Cox 1997). Although a modest body of research has related non-daytime work to measures of child development (Dunifon et al. 2005; Han 2005; Joshi and Bogen 2007; Morrissey et al. 2011; Stradzins et al. 2004, 2006), very little work has examined the role of irregular, or fluctuating, work hours in predicting child development.

In addition to extending this literature by examining irregular work hours, the present study assesses the associations between job instability and children's development. Parental job loss can have short- and long-term consequences for children, and this may be especially true for low-income families. Oreopoulos et al. (2008) showed that adults who experienced their fathers' job losses during adolescence have dramatically reduced earnings as adults, and that this is particularly the case among low-income families. Kalil and Ziol-Guest (2008), Kalil and Wightman (2011), and Coelli (2011) found that parental job loss is associated with problems in school and with lower educational attainment.

In sum, although these studies have made important contributions to the literature, a remaining question is how patterns of employment common to the low-wage labor market—specifically long work hours, fluctuating work hours, and job instability—are associated with children's behavior and academic progress. Addressing these questions is the goal of this article.

## Methods

### Conceptual Framework

Child development is a complex process, with maternal work patterns representing only one influence. Because of the inherently dynamic character of children's development, an outcome in one period is influenced by outcomes in earlier periods as well as inputs from the home and other environments. Our approach, which relies on rich, longitudinal data, has several advantages.

The empirical framework we adopt conceptualizes child development as a cumulative process. Current and past inputs from maternal and other investments interact with the child's innate ability to produce child development. This framework can be expressed as

$$O_{it} = \beta_1 T_{it} + \beta_2 C_{it} + \beta_3 G_{it} + \beta_4 \mathbf{X}_{it} + \alpha_i + v_{it}, \quad (1)$$

where  $O_{it}$  is a behavioral outcome for child  $i$  at age  $t$ ;  $T_{it}$  is a measure of the quantity/quality of maternal time spent with the child through age  $t$ ;  $C_{it}$  is a measure for the

quantity/quality of child care and other nonmaternal time inputs;  $G_{it}$  represents goods used in the production of child development (e.g., financial investments in medical care and books/toys to promote healthy child development); and  $\mathbf{X}_{it}$  is a vector of controls for living arrangements, parental characteristics, and demographic variables. The error component,  $\alpha_i$ , represents a fixed innate child ability/temperament effect, and  $v_{it}$  is a transitory error term that includes measurement error in the reported child behavioral outcome.

In this article, we use maternal employment patterns to proxy for maternal time inputs in children. Including parental income in the child production function is problematic because income can be reduced when more time is spent caring for one's children. We therefore exclude family income from the primary analyses reported in the text. However, estimates from models that included family income and its sources were similar to those reported in the text (see Tables A1–A3 in Online Resource 1). We now turn to a discussion of how the measures in our analysis map onto the underlying parental input parameters of interest discussed previously.

### Empirical Strategy

The primary methodological challenge in estimating the impact of maternal employment patterns on child well-being stems from the fact that the decision to work or stay at home (or, more generally, the choice of the type of work and number of work hours) is endogenous to, or itself related to, child outcomes. Moreover, mothers who hold jobs, work long hours, or experience a given type of job transition, for example, differ from those who do not in both observable and unobservable ways that may also affect child well-being. As a result, cross-sectional estimates of the impact of hours worked by the mother on measures of child well-being may suffer from both simultaneity (or reverse causality) and omitted variable bias (due to unobserved heterogeneity).

To address these issues, we estimate the following models: (1) ordinary least squares (OLS) models; (2) child fixed-effects (specified in first-difference form) models; and (3) longer-run value-added (fixed-effects) models. We examine the influence on children of the level of work intensity (work hours) as well as the influence of the volatility of maternal employment. We compare results from OLS models and the child fixed-effect models to assess the degree of bias due to time-invariant unobservable factors. In our primary models, we exclude arguably endogenous variables and factors that *result* from maternal jobholding (such as family income, parental stress, housing, and neighborhood conditions), since these may capture a portion of the effect of maternal employment patterns. We then examine how our estimates of the effects of maternal work patterns change when we include an extensive set of time-varying covariates in the models. In this approach, we follow Altonji et al. (2005), Duncan (2003), and Ruhm (2004). In the next subsection, we outline in more detail the three empirical approaches that we take.

#### OLS Models

The main OLS model we estimate is

$$O_{it} = \alpha_0 + \beta \mathbf{E}_{it}^m + \delta \mathbf{X}_{it}^p + \phi \mathbf{X}_{it}^c + \varepsilon_{it}, \quad (2)$$

where  $O$  represents child outcome measure for child  $i$  at time  $t$ ;  $\mathbf{E}$  represents a vector of maternal employment pattern measures experienced since the prior wave ( $t - 1$ ) through time  $t$  (e.g., whether the mother worked between waves; whether she experienced job stability, instability, and job mobility; whether she worked full-time; and whether she had fluctuating work hours on the primary most-recent job between waves);  $\mathbf{X}^p$  and  $\mathbf{X}^c$  are vectors of parents' ( $p$ ) and children's ( $c$ ) demographic characteristics, including child age, gender, race, maternal age and education, and measures of the home environment; and  $\varepsilon$  represents the composite error term, including permanent ( $\alpha_i$ ) and transitory components ( $v_{it}$ ). For those child outcomes that are binary indicators—whether the child had school absenteeism problems and whether the child exhibited disobedient or disruptive behavior problems in school—we estimate probit models and present the marginal effects evaluated at the means. Linear probability models for these latter outcomes yielded the same pattern of results.

### Child Fixed-Effect Models

Our primary method involves the estimation of child fixed-effects (CFE) models (specified in first-difference form, as discussed in the ensuing paragraphs), taking advantage of the repeated measures of child well-being and maternal work behavior in our data. This approach controls for all observable and unobservable family and child characteristics that do not change over time.

Equations 3 and 4 represent two observations, one at time  $t - 1$  and the other at time  $t$ , for the same child.

$$O_{it-1} = \alpha_0 + \alpha_i + \beta \mathbf{E}_{it-1}^m + \delta \mathbf{X}_{it-1}^p + \varphi \mathbf{X}_{it-1}^c + v_{it-1} \quad (3)$$

$$O_{it} = \alpha_0 + \alpha_i + \beta \mathbf{E}_{it}^m + \delta \mathbf{X}_{it}^p + \varphi \mathbf{X}_{it}^c + v_{it}. \quad (4)$$

The term  $\alpha_i$  represents the child-specific fixed effect. Based on these equations, we estimate a model of changes in child outcomes of the following form:

$$\Delta O_{it}^c = \beta \times \Delta \mathbf{E}_{it}^m + \delta \times \Delta \mathbf{X}_{it}^p + \varphi \times \Delta \mathbf{X}_{it}^c + \Delta v_{it}^c, \quad (5)$$

where all differences are estimated by subtracting characteristics of the previous time period from those of the contemporaneous period. The advantage of this model is that all observable and unobservable family- and child-specific fixed effects are removed and the effect is identified from the difference in children's outcomes as a function of changes in maternal employment patterns, changes in work hours, and other changes in job attributes that have occurred over this period. The model allows us to analyze the effects on children's behavior of a mother's movement from job stability (experienced in the prior period) to job instability experienced during the most recent period, for example. The differencing eliminates time-invariant unobserved measures, while also controlling for observable changes in family characteristics.

One disadvantage of the CFE model is that it does not control for unobservable family characteristics that vary. Nor does this model address issues of reverse causality, in which mothers change their employment patterns in response to changes in child characteristics. For example, evidence suggests that mothers work less when



their children have health or developmental problems (e.g., Corman et al. 2005). To address this, we utilize information on reasons for mothers' job changes, including whether they occurred because of child care concerns and/or concerns about their children's health; our analyses utilize a measure of maternal job changes including only those that were not due to such concerns.

Maternal job changes may co-occur with other stressful life events. That is, there might be changes within the family (or for the child) that coincide with differences in maternal employment characteristics and that are also associated with child outcomes. The expanded model specifications (including more-extensive maternal and family characteristics) aim to minimize this problem. However, if unobserved characteristics are associated with patterns of employment continuity and changes in children's outcomes, then our CFE estimates would be biased.

One final limitation of the CFE approach is that it ignores the potentially important role of prior maternal employment activities. Accordingly, we estimated a series of expanded models, adding lags of maternal employment pattern measures from earlier periods to our main specifications to probe the robustness of our findings and as a specification check (discussed in the next subsection).

### *Long-Difference Models*

We also estimate child fixed-effect models in long differences. The long-difference specifications are designed to examine the longer-run impacts of maternal employment patterns on child development and to investigate whether these effects compound over time. By comparing the results of first-difference and long-difference fixed-effects models, we examine whether the influence of maternal work behavior on child behavioral outcomes represents a short-term adjustment or, instead, longer-run consequences for child well-being. Additionally, long differences reduce the problem of a mother's work behavior being highly serially correlated, leading much of the observed variation in work intensity over short periods to be due to measurement error (Griliches and Hausman 1986).

In the longer-run model, child outcomes measured at the end of the sample period serve as the dependent variable, predicted by cumulative measures of maternal employment spanning the period between the first and last waves, controlling for the corresponding child assessment measure from the first wave. Thus, coefficients on the maternal employment variables can be interpreted as the cumulative effects of these employment patterns on the change in child well-being over the sample period:

$$O_{i5} = \alpha_0 + \alpha O_{i1} + \beta \mathbf{E}_{i,\Delta 1-5}^m + \delta \mathbf{X}_{i,\Delta 1-5}^p + \varphi \mathbf{X}_{i,\Delta 1-5}^c + v_{i5}. \quad (6)$$

Specifically, we count the total number of times over the five waves that a mother experienced long work hours, job instability, or fluctuating work hours, and then ask whether the total number of periods a child's mother experienced a given job condition predicts changes in the child's behavior during that same period. As a robustness check, we estimated alternative specifications that used the change in the respective child behavior measure between Wave 1 and Wave 5 as the outcome ( $O_{i5} - O_{i1}$ ), instead of taking the lagged dependent variable approach; the qualitative pattern of results was unchanged.



We expect school-related indicators, such as grade repetition and placement in special education, to be more sensitive to exposure to working conditions over several years as opposed to exposures that occur in a single period. We therefore analyze the longer-run impacts of maternal employment patterns experienced between Waves 1 and 4 on the likelihood of grade repetition and placement in special education by the end of the sample period, conditional on these transitions not occurring in previous periods, to ensure that the maternal employment pattern preceded the assessed child outcome. We include a vector of child age dummy variables, since the probability of experiencing academic difficulty varies systematically by age. We present the marginal effects on the likelihood of these probabilities, evaluated at the means of the set of explanatory measures.

Of course, even the use of fixed-effects models, robustness checks, and extensive control measures (all described in the next subsections) cannot rule out issues of endogeneity (the possibility that unmeasured variables differentiate mothers with different work patterns and whose children have different outcomes) and reverse causality. Short of a randomized design, fully addressing such concerns is difficult. While acknowledging that we cannot fully address issues of endogeneity and reverse causality, we report that our results are robust across the inclusion of a wide range of controls and across several specification and robustness checks.

Keeping the strengths and weaknesses of each of our approaches in mind, we turn next to describe the data and key measures, and present the results.

## Data and Measures

The Women's Employment Study (WES) is a longitudinal study, spanning a seven-year period, of a sample of women drawn from the cash assistance rolls in an urban Michigan county in February 1997. The WES was conducted at the University of Michigan's Poverty Research and Training Center. Michigan's Family Independence Agency (FIA) provided names and addresses of all single-parent cases in the county, and a stratified random sample of women between the ages of 18 and 54 was drawn. Approximately 56% of respondents are African American, and 44% are white.

The sample was drawn as welfare reform and the resulting new work requirements were being implemented in Michigan. Whereas all respondents received cash assistance in February 1997, about one-quarter had left welfare by the first assessment in fall 1997, one-half by fall 1998, 75% by fall 1999, and 75% by fall 2001.

The first wave of WES interviews was completed between August and December 1997, with a sample of 753 single mothers (an 86% response rate). Of these 753 mothers, 575 who had a child between the ages of 2 and 10 at Wave 1 were selected to be part of the "target child sample" and were administered additional questions assessing parenting and child well-being in each survey wave, via mothers' reports. The analyses presented here use data from questions asked about these target children. The WES respondents were interviewed five times during the period from 1997 to 2003, with wave-to-wave attrition rates consistently less than 10%.<sup>1</sup>

<sup>1</sup> Researchers have found no differences in race, age, education, earnings, or family structure between women who dropped out of the survey and those who stayed until the final wave (Cadena and Pape 2006).

There was tremendous variation in local labor market demand conditions over the seven-year period we study. The state unemployment rate was 4%–5% in 1997 and 1998, dropped to 3%–4% in 1999 and 2000, but then increased significantly during the 2001 recession, and was as high as 8% in 2003 (the local unemployment rate followed a similar pattern).

The analyses presented here take advantage of all five waves of data. The average age of target children was 4.7 years at Wave 1. At Wave 5, the target children were between the ages of 5 and 17, with an average age of 10.75 years ( $SD = 2.40$  years).

### Dependent Variables

Our dependent variables capture aspects of children's emotional well-being with three measures of child behavior: an index of total behavior problems, an index of externalizing behavior problems, and an index of internalizing behavior problems, each relying on maternal reports. The survey contained a subset of items from the Behavioral Problems Index (BPI) described in Chase-Lansdale et al. (1991); a full set of BPI items was collected in the final wave and is utilized in our longer-run analyses. *Externalizing behavior* (three items) includes items such as "bullies or is cruel or mean to others" and "breaks things deliberately." Mothers indicated whether these behaviors were not true (1), sometimes true (2), or often true (3) for their child. This variable ranges from 3 to 9. *Internalizing behavior* (five items) focuses on sadness ("unhappy, sad"), being withdrawn, and feelings ("feels worthless"). Values range from 5 to 15. Our measure of *total behavior problems* is a 12-item summary index that combines these two scales and includes four additional items measuring fear/anxiety in the child. Higher scores on each of these measures indicate higher levels of behavioral problems. Prior research has documented that the BPI is associated with other, more clearly observed aspects of children's well-being, such as test scores (Center for Human Resource Research 1993).

School-related measures include a maternal report of whether the child had exhibited *disruptive and/or disobedient behavior problems in school* (defined as sometimes or often displaying such behavior). We also assess *school absenteeism*, defined as regularly missing school at least one or more times a month. In our longer-run models, we use measures of whether the child was ever placed in *special education* and ever *repeated a grade*.

### Characterizing Maternal Employment Patterns

Our key independent variables capture maternal employment experiences occurring between waves. First is a measure of *whether a mother worked* at all between waves. Nearly 90% of mothers worked at some point over the past year. The diversity in work involvement among our sample lies not in whether or not mothers worked, but in the significant variation in the nature and pattern of that employment and the number and regularity of hours worked.

Including an indicator of whether a mother worked allows us to ask the following question: "When mothers work, how do conditions of her job, such as its stability or the predictability of its work hours, influence children's development?" If we did not control for whether a mother was working, it would be difficult to know whether our

measure of “fluctuating hours,” for example, was capturing the effect on children of working fluctuating hours compared with nonwork (not our primary interest) or, instead, the effect of fluctuating hours compared with work at predictable hours (our primary interest).

Mothers’ *job transitions* between waves are based on mothers’ reports gathered at each wave on job tenure, monthly job/employment history, and reported reason for job separation (if any occurred). This includes information on whether any job changes resulted from involuntary job separations, as well as job changes that were initiated by women because of child care concerns and/or concerns about their children’s health (mothers could identify multiple reasons for job separations).<sup>2</sup> We distinguish job transitions as voluntary or involuntary (i.e., due to being laid off or fired), and whether they were followed by a nonemployment spell of four or more weeks.

In our main analyses, we examine three patterns of job transitions: *job stability*, *job mobility*, and *job instability*. Individuals whose current or most recent job at a given wave was the same as that held at the previous wave have job stability (this is the reference group). Job mobility occurs when a respondent makes a voluntary job change from one wave to the next, without experiencing any involuntary separations or transitions into nonwork, and with an interval between jobs of less than four weeks. Conversely, job instability refers to being laid off or fired; this category also includes women who quit a job because of dissatisfaction for reasons such as inadequate pay, poor working conditions, suboptimal hours, poor job match, or transportation problems, with an intervening spell of nonemployment of at least one month. Job changes that are driven by maternal concerns for child care or the general well-being of the child are not considered in our measure of job instability; they are classified as voluntary job mobility.

Our main analyses also include a variable indicating whether the mother *worked full-time*, defined as 35 or more hours per week in the current or most recent job. We also include a variable measuring whether the mother reported that her job entailed *fluctuating work hours*. This variable identifies mothers who responded “a lot” or “a fair amount” to a question asking, “Does the number of hours you work from week to week change a lot, a fair amount, a little, or hardly at all?”

## Other Controls

As mentioned earlier, our main specifications include controls for factors that are not related to employment itself. These include child age, gender, race, mother’s age and education, a home literacy environment index, mother’s living arrangements (i.e., whether she was married, cohabiting with romantic partner, or single, and whether the child’s grandmother lives in the household), and a measure of father involvement in child rearing. The measure of father involvement in child rearing is included as a way of capturing other time inputs into children’s development, to allow us to better

<sup>2</sup> There is some noncomparability in the characterization of involuntary job loss because of changes in the wording of these questions across waves. Thus, we emphasize the involuntary job loss effects in the longer-run models as opposed to the short-run models that use between-wave changes that could instead reflect changes in the wording of the survey question.

isolate the contribution of mothers' inputs. Because family structure and living arrangements influence child development outcomes, we control for these measures in our main models so that we do not mistakenly attribute their influences to those of maternal employment patterns.

We also present expanded model specifications (in Tables A1–A3 in Online Resource 1), which utilize an extensive set of additional controls, not available in most other studies. These measures are described in Online Resource 1.

In all regression models, standard errors are clustered at the child level because each child is observed multiple times in our data.

## Results

### Descriptive Analyses

Looking across all periods, the average child age was 7 years (Table A1 in Online Resource 1). The average level of externalizing problems was 4.69 points on a scale ranging from 3 to 9, and the average internalizing scale was 6.05 points on a scale ranging from 5 to 15. To understand how children in the WES compare to other children, we compared their behavior problems measures with those of the average 5- to 15-year-old U.S. child in 1997 (using data from the 1997 Panel Study of Income Dynamics Child Development Supplement (PSID-CDS)). This comparison shows that WES children have significantly higher average levels of mother-reported externalizing behavior problems than the average U.S. child (4.69 in WES vs. 3.95 in the PSID-CDS), but have similar levels of internalizing behavior problems (6.05 in WES vs. 5.96 in the PSID-CDS). However, compared with PSID-CDS children with similar backgrounds—those with single mothers who have a high school diploma or less—WES children exhibit similar levels of internalizing and externalizing behavior (with the less-advantaged PSID-CDS sample having externalizing scores of 4.27 and internalizing scores of 6.17).

We find high levels of school-related behavior problems for WES children. Across the entire survey period, two-thirds exhibited disruptive behavior problems in school and nearly half were absent from school at least one or more times per month. Adequate data do not exist to compare these outcomes with those of the average U.S. child. WES children also exhibit high rates of ever repeating a grade (26%) and being placed into special education (20%).

Before presenting the results of our regression analysis, we first examine the simple bivariate associations between maternal employment patterns and child developmental outcomes. Table 1 presents simple descriptive statistics for each of our child behavioral outcomes (in standard deviation units expressed as deviations from their respective means) broken out by the intensity of mother's work per week (full-time vs. part-time), regularity of work schedule, and type of job transition pattern experienced over the past one to two years (job stability, instability, mobility).

We see that children whose mothers worked long hours (i.e., full-time hours) experienced more externalizing behavior problems and were more likely to be disruptive in school, relative to children whose mothers worked part-time. Relative to children whose mothers worked a predictable set of hours or whose

**Table 1** Children's outcomes classified by mother's recent employment history: WES 1997–2003

Child Outcome	Mother's Employment Patterns <sub>(t-1,t)</sub>									
	No Work <sub>(t-1,t)</sub>	Part-Time Job <sub>(t-1,t)</sub>	Full-Time Job <sub>(t-1,t)</sub>	Fluctuating Work Hours <sub>(t-1,t)</sub>	Regular Work Hours <sub>(t-1,t)</sub>	Job Stability <sub>(t-1,t)</sub>	Job Instability <sub>(t-1,t)</sub>	Job Mobility <sub>(t-1,t)</sub>		
BPI, Total Score (in SD units)	0.13	-0.03	-0.01	0.20 <sup>‡</sup>	-0.09	-0.24 <sup>‡</sup>	0.19	-0.15		
BPI, Externalizing (in SD units)	0.08	-0.09 <sup>‡</sup>	0.03	0.13 <sup>‡</sup>	-0.06	-0.23 <sup>‡</sup>	0.16	-0.06		
BPI, Internalizing (in SD units)	0.18	-0.07	-0.01	0.10 <sup>‡</sup>	-0.08	-0.17 <sup>‡</sup>	0.33	-0.05		
Disruptive in School	0.28	0.33 <sup>‡</sup>	0.37	0.34	0.36	0.36 <sup>‡</sup>	0.41	0.36		
School Absenteeism Problem	0.22	0.19	0.19	0.22 <sup>‡</sup>	0.19	0.15 <sup>‡</sup>	0.24	0.16		

*Notes:* The sample consists of all WES target children for whom information was collected during five waves of interviews with mothers between 1997 and 2004. The BPI child behavioral outcomes are in standard deviation (SD) units expressed as deviations from their respective means. Relevant comparisons for statistical significance of the difference in the mean of the child outcome are part-time versus full-time work, regular versus fluctuating hours, and job stability versus job instability.

<sup>‡</sup>  $p < .10$

jobs were stable, those whose mothers either had fluctuating hours or experienced job instability had significantly more behavior problems overall, greater externalizing and internalizing problems, and were more likely to have school absenteeism problems.

Of course, mothers who have different employment patterns are different from one another in ways, beyond simply their work experiences, that may also contribute to the differences in their children's developmental outcomes. Table 2 highlights this point by presenting a series of family characteristics broken out by the same maternal employment patterns as presented in Table 1. For example, compared with mothers who experienced job stability, mothers who experienced job instability, on average, had less family income and earnings; were less educated; were more likely to receive welfare, to experience food insufficiency, or to have been evicted at some time in the past year; and had worse health.

Other analyses (not shown) examined the correlation of levels and trajectories of children's behavioral adjustment over time, as well as the extent to which these measures differ across children. Results show significant variation across children in their initial levels of behavioral problems and in the growth rate of these problem behaviors over time.<sup>3</sup>

## Regression Results

Table 3 presents results from OLS models examining the associations of maternal employment patterns and child well-being.<sup>4</sup> Results show that working is associated with lower behavior problems scores compared to not working. After we control for employment, results show that children whose mothers experienced job instability or worked in jobs with fluctuating hours have significantly higher behavior problems scores relative to children whose mothers experienced stable work patterns. For example, children whose mothers worked and experienced job instability since the prior wave had behavior problem scores that were 1.28 points higher than children whose mothers worked and experienced job stability—a magnitude that is equivalent to 40% of a standard deviation increase in the level of total behavior problems. Job instability is also associated with a 6.0 and 7.7 percentage point higher likelihood of disruptive problems in school and school absenteeism problems, respectively, compared with job stability. Voluntary job mobility is not associated with worse behavioral outcomes relative to job stability. We also find that exposure to fluctuating work hours since the prior wave is associated with greater externalizing, internalizing, and total behavior problems. The combination of maternal job instability and fluctuating work hours together have estimated associations with child behavior that

<sup>3</sup> Based on the unconditional hierarchical random-effects model results (not shown), a 1 standard deviation increase in the level of BPI, externalizing behavior problems index, and internalizing behavior problems index is 3.2312, 1.0358, 0.8423, respectively (all net of measurement error and transitory fluctuations). A 1 standard deviation increase in the annual growth rate of BPI and externalizing and internalizing behavior problems index is 0.4490, 0.1440, and 0.2241, respectively.

<sup>4</sup>  $O_{it} = \beta_1 \text{Worked}_{i-1,t} + \beta_2 \text{Worked} \times \text{JobInstability}_{i-1,t} + \beta_3 \text{Worked} \times \text{JobMobility}_{i-1,t} + \beta_4 \text{Worked} \times \text{FullTime}_{i-1,t} + \beta_5 \text{Worked} \times \text{FluctuateWkHrs}_{i-1,t} + \delta \mathbf{X}_{it}^p + \phi \mathbf{X}_{it}^c + \alpha_0 + \alpha_i + v_{it}$ .

The OLS model estimated as expressed with the maternal employment measures is shown.

**Table 2** Other characteristics of childhood families classified by mother's recent employment history: WES 1997–2003

Mother's Employment Patterns $S_{t-1,t}$									
	No Work $(t-1,t)$	Part-Time Job $(t-1,t)$	Full-Time Job $(t-1,t)$	Fluctuating Work Hours $S_{t-1,t}$	Regular Work Hours $S_{t-1,t}$	Job Stability $(t-1,t)$	Job Instability $(t-1,t)$	Job Mobility $(t-1,t)$	Job
Used Paid Child Care Services $S_{t-1,t}$ (for any child)	0.03	0.22 <sup>†</sup>	0.28	0.22 <sup>†</sup>	0.27	0.26	0.24	0.30	
Income Sources and Material Hardship									
Family income-to-needs ratio $t-1,t$	0.84	1.05 <sup>†</sup>	1.29	1.12 <sup>†</sup>	1.22	1.36 <sup>†</sup>	1.10	1.34	
Maternal earnings $S_{t-1,t}$	0.02	0.49 <sup>†</sup>	0.96	0.68 <sup>†</sup>	0.80	1.09 <sup>†</sup>	0.52	1.11	
Received welfare $t-1,t$	0.71	0.50 <sup>†</sup>	0.28	0.42 <sup>†</sup>	0.35	0.21 <sup>†</sup>	0.35	0.19	
Food insufficiency index $t-1,t$	0.29	0.23 <sup>†</sup>	0.18	0.23 <sup>†</sup>	0.19	0.18 <sup>†</sup>	0.21	0.17	
Residential Mobility/Instability Variables									
Moved $t-1,t$	0.38	0.41 <sup>†</sup>	0.46	0.43	0.44	0.36 <sup>†</sup>	0.51	0.41	
Evicted $t-1,t$	0.08	0.09 <sup>†</sup>	0.07	0.09	0.07	0.03 <sup>†</sup>	0.12	0.05	
Neighborhood disadvantage (crime) $_{t,t}$	0.55	0.48 <sup>†</sup>	0.54	0.55 <sup>†</sup>	0.50	0.50	0.53	0.49	
Parental Characteristics									
Parental stress index $t$	22.29	21.68	22.01	21.82	21.90	22.05	21.90	22.03	
Stressful life events index $_{t,t}$	2.09	2.16	2.25	2.34 <sup>†</sup>	2.18	2.10 <sup>†</sup>	2.32	2.11	
Social support index $_{t,t}$	4.27	4.35	4.32	4.22 <sup>†</sup>	4.36	4.42 <sup>†</sup>	4.28	4.39	
White	0.44	0.51 <sup>†</sup>	0.40	0.40 <sup>†</sup>	0.46	0.47	0.43	0.44	
Black	0.56	0.49 <sup>†</sup>	0.60	0.60 <sup>†</sup>	0.54	0.53	0.57	0.56	
Maternal education									
High school dropout	0.41	0.27	0.24	0.28 <sup>†</sup>	0.24	0.18 <sup>†</sup>	0.30	0.18	
High school graduate $t$	0.34	0.38	0.39	0.38	0.39	0.39	0.40	0.35	
Some college $t$	0.25	0.36	0.37	0.34	0.37	0.42 <sup>†</sup>	0.30	0.46	
Home literacy environment index $_{t,t}$	2.91	3.13 <sup>†</sup>	3.25	3.21	3.20	3.29 <sup>†</sup>	3.10	3.26	



Table 2 (continued)

	Mother's Employment Patterns $s_{(t-1,t)}$							
	No Work $_{(t-1,t)}$	Part-Time Job $_{(t-1,t)}$	Full-Time Job $_{(t-1,t)}$	Fluctuating Work Hours $_{(t-1,t)}$	Regular Work Hours $_{(t-1,t)}$	Job Stability $_{(t-1,t)}$	Job Instability $_{(t-1,t)}$	Job Mobility $_{(t-1,t)}$
Never-married mother $_{WT}$	0.58	0.58 <sup>†</sup>	0.64	0.60	0.62	0.62	0.64	0.58
Father involvement index $_{WT}$	10.05	9.68	9.54	9.91 <sup>†</sup>	9.49	9.88 <sup>†</sup>	9.33	9.72
Harsh parenting index $_{WT}$	13.39	14.33	14.42	14.42	14.37	14.34	14.44	14.48
Mother's alcohol or drug use problem $_{WT}$	0.19	0.23	0.21	0.23	0.21	0.20 <sup>†</sup>	0.24	0.19
Mother's physical health problem $_{WT}$	0.37	0.17	0.16	0.20 <sup>†</sup>	0.15	0.14 <sup>†</sup>	0.19	0.14
Mother's probable diagnosis major depression $_{WT}$	0.30	0.22	0.21	0.24 <sup>†</sup>	0.21	0.18 <sup>†</sup>	0.24	0.21

Notes: The sample consists of all WES target children, for whom information was collected during five waves of interviews with mothers between 1997 and 2004. Relevant comparisons for statistical significance of the difference in the mean of the child outcome are part-time versus full-time work, regular versus fluctuating hours, and job stability versus job instability.

<sup>†</sup>  $p < .10$

**Table 3** The effects of maternal employment patterns on child well-being: All behavior problems, WES 1997–2003

Maternal Employment-Related Variables	Dependent Variables—Child Outcomes <sub><i>t</i></sub>				
	OLS			Probit Models (Marginal Effects)	
	Behavior Problem Index <sub><i>t</i></sub>	Externalizing Scale <sub><i>t</i></sub>	Internalizing Scale <sub><i>t</i></sub>	Prob(Disruptive in School) <sub><i>t</i></sub>	Prob(School Absenteeism) <sub><i>t</i></sub>
	(1)	(2)	(3)	(4)	(5)
Worked <sub><i>t</i> - 1, <i>t</i></sub> (ref. = job stability)	-1.4170** (0.4775)	-0.3713* (0.1660)	-0.5476** (0.1728)	-0.0127 (0.0527)	-0.0432 (0.0584)
Worked <sub><i>t</i> - 1, <i>t</i></sub> × Job Instability <sub><i>t</i> - 1, <i>t</i></sub>	1.2802** (0.2694)	0.2801** (0.0944)	0.4594** (0.1001)	0.0603 <sup>†</sup> (0.0341)	0.0772* (0.0374)
Worked <sub><i>t</i> - 1, <i>t</i></sub> × Voluntary Job Mobility <sub><i>t</i> - 1, <i>t</i></sub>	0.2848 (0.2687)	0.1052 (0.0994)	0.1729 <sup>†</sup> (0.1068)	0.0086 (0.0372)	-0.0265 (0.0384)
Worked × Full-Time Work <sub><i>t</i> - 1, <i>t</i></sub>	0.2941 (0.2592)	0.1422 <sup>†</sup> (0.0867)	0.0153 (0.0983)	0.0266 (0.0299)	-0.0046 (0.0332)
Worked × Fluctuating Work Hours <sub><i>t</i> - 1, <i>t</i></sub>	0.8759** (0.3025)	0.2509** (0.0955)	0.2706* (0.1134)	-0.0164 (0.0328)	0.0400 (0.0373)
Child-Year Observations	1,572	2,256	2,249	2,115	1,068
Number of Children	520	575	575	564	456

*Notes:* Robust standard errors (clustered on child) are shown in parentheses. All models include controls for child's age, gender, race, maternal age, maternal education, home literacy environment scale, family structure, and father involvement in child rearing. These effects are suppressed in the table to conserve space. In these analyses, the coefficient on "worked" represents the influence on children of mothers working and experiencing job stability between waves, relative to not working. The coefficients on job instability are in reference to those who worked and had job stability. So, for example, the coefficient on "worked × job instability" indicates the change in children's behavior associated with a mother's experience of job instability in the past 1–2 years (relative to the experience of job stability). To understand the influence on children of the movement from nonwork to an unstable job, one would sum the coefficients on "worked" and "worked × job instability." Because nearly all mothers worked at some point during the past year, the working versus not working comparison is less useful than is characterizing the nature and pattern of employment and identifying differential effects in the type of maternal work involvement on child well-being.

<sup>†</sup> $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$

are equivalent to two-thirds of a standard deviation increase in the level of total behavior problems.

For each outcome, we performed a series of models with the expanded set of control measures noted previously. Results from these models indicated that although these factors have independent influences on child behavior problems, these measures did not appreciably change the relationship between maternal employment and child development (Table A2 in Online Resource 1).

### First-Difference Model Results

Table 4 presents results from first-difference specifications. For computational simplicity, linear probability models are used for the dichotomous child outcome measures. These models relate wave-to-wave changes in mothers' employment experiences to changes in children's outcomes.

**Table 4** The effects of maternal employment patterns on child well-being: All behavior problems, WES 1997–2003 (first-difference models)

Maternal Employment-Related Variables	Dependent Variables— $\Delta$ Child Outcomes $_{t-1,t}$				
	$\Delta$ Behavior Problem Index $_{t-1,t}$	$\Delta$ Externalizing Scale $_{t-1,t}$	$\Delta$ Internalizing Scale $_{t-1,t}$	$\Delta$ Prob(Disruptive in School) $_{t-1,t}$	$\Delta$ Prob(School Absenteeism) $_{t-1,t}$
	(1)	(2)	(3)	(4)	(5)
$\Delta$ Worked $_{t-1,t}$ (ref. = $\Delta$ job stability)	-0.6074 (0.4251)	-0.1845 (0.1691)	-0.1081 (0.2044)	0.0256 (0.0727)	-0.0431 (0.0764)
$\Delta$ Job Instability $_{t-1,t}$	0.6967** (0.2392)	0.2126* (0.0838)	0.2611* (0.1096)	-0.0022 (0.0392)	0.0669 <sup>†</sup> (0.0386)
$\Delta$ Voluntary Job Mobility $_{t-1,t}$	0.2964 (0.2267)	0.1280 (0.0891)	0.1431 (0.1088)	0.0465 (0.0409)	0.0498 (0.0383)
$\Delta$ Full-Time Work Hours $_{t-1,t}$	-0.0208 (0.2359)	0.0403 (0.0861)	-0.0780 (0.1015)	0.0307 (0.0370)	0.0132 (0.0398)
$\Delta$ Fluctuating Work Hours $_{t-1,t}$	0.4728* (0.2373)	0.1519 <sup>†</sup> (0.0834)	0.2351* (0.1041)	-0.0599 (0.0392)	0.0224 (0.0475)
Child-Year Observations	1,047	1,666	1,656	1,478	744
No. of Children	457	524	523	497	408

Notes: Robust standard errors (clustered on child) are shown in parentheses. All models include controls for changes in child's age, maternal education, home literacy environment scale, family structure, and father involvement in child rearing, as well as the number of months between waves. These effects are suppressed in the table to conserve space. In these analyses, the coefficient on " $\Delta$  worked" represents the effect of a mother's movement from not working (in the prior period) to working and experiencing job stability during the most recent 1–2 years. The coefficient on " $\Delta$  job instability" indicates the change in children's behavior associated with a mother's movement from job stability (experienced in the prior period) to job instability experienced during the most recent 1–2 years. To understand the influence on children of the movement from job mobility to job instability, one would subtract the coefficient on " $\Delta$  voluntary job mobility" from the coefficient on " $\Delta$  job instability." To understand the influence on children of the movement from nonwork to an unstable job, one would sum the coefficients on " $\Delta$  worked" and " $\Delta$  job instability." Because nearly all mothers worked at some point during the past year, the working versus not working comparison is less useful than is characterizing the nature and pattern of employment and identifying differential effects in the type of maternal work involvement on child well-being.

<sup>†</sup>  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$

Results in Table 4 show that job instability and fluctuating work hours are significantly related to increases in children's behavior problems. To put the magnitude of these relationships in perspective, we find that the impact of moving from stable, predictable work hours to fluctuating weekly work hours represents approximately one full standard deviation increase in the growth rate of behavior problems.<sup>5</sup>

To interpret the increases in child behavior problems represented by these effects, it is useful to consider a child who, if the mother experienced stable work patterns, would achieve about the average behavior score of all children in the sample. An increase by one-fifth of a standard deviation in the level of internalizing problem

<sup>5</sup> A 1 standard deviation increase in the average *growth* rate of behavior problems is equivalent to roughly 0.20 of a standard deviation increase in the average *level* of behavior problem indices we measure. The much larger effect sizes of the results from the change models capture the average effects on the *growth* rate of these problem behaviors, while these effects translate to smaller changes in the *levels* of these behaviors.

behaviors (the average increase in the level of internalizing behavior problems among children when mothers experienced fluctuating work hours) means that child would move from the 50th to the 58th percentile of problem behaviors after a single period of exposure.

Increases in job instability (relative to job stability) represent about one full standard deviation increase in the average growth rate of behavior problems index. Moreover, the effect size of job instability on the growth rate of internalizing behavior problems translates into 0.31 of a standard deviation increase in the level of internalizing behavior problems. For the average child, this means that he or she would move from the 50th percentile of all children to the 62nd percentile in exhibiting internalizing problem behaviors when a mother experiences job instability. The combined estimated effects of maternal job instability and fluctuating work hours on child well-being are equivalent in magnitude to a 58% standard deviation increase in the level of internalizing behavior problems. A similar pattern of results emerges for externalizing behaviors.

Taken together, our results indicate that job instability and fluctuations in work hours are important correlates of children's behavior problems. Results are consistent across the OLS and fixed-effects model specifications, providing reassurance that our OLS model results were not driven primarily by unobserved heterogeneity in fixed characteristics.

### Long-Difference (Value-Added) Model Results

We next examine the longer-run impacts of maternal employment patterns on various dimensions of child development, including whether the child ever repeated a grade or was placed in special education between the final waves of the study. We estimate the influence of cumulative maternal employment experiences during the Wave 1 to Wave 4 period on the transition probabilities for these outcomes between Waves 4 and 5.

In the longer-run models, we also investigate whether the potentially negative consequences for children of mothers' full-time work hours are offset by the positive effects of jobs that require more cognitive skills. Our test of this dynamic relationship is informed by Johnson's (2007) previous work using the WES demonstrating that jobs requiring more cognitive skills—in particular, daily use of reading/writing and computer use—have significantly higher prospects for wage growth, exhibit lower turnover, and are primary pathways to upward mobility, independent of characteristics of the workers who fill these jobs. To examine whether the influence of mothers' full-time work hours on children differs by the skills required for the job, we interacted our indicator for entry into full-time work hours with an indicator for whether this shift was accompanied by a change to a job involving reading/writing and computer skills. If women enter jobs that require cognitive skills and that lead to wage growth and job stability, any possible negative influences of longer work hours on children may be reduced.

Results from longer-run analyses are presented in Tables 5 and 6, as well as Tables A4 and A5 in Online Resource 1. We compare the effect of involuntary job separations due to being fired or laid-off with that of voluntary job-to-nonemployment transitions typically initiated by women due to dissatisfaction with working

**Table 5** The longer-run impacts of maternal employment patterns on child well-being: WES 1997–2003

	Dependent Variables— $\Delta$ Child Outcomes $_{W1,W5}$				
	Behavior Problem Index $_{W5}$	Externalizing Scale $_{W5}$	Internalizing Scale $_{W5}$	Prob(Disruptive in School) $_{W5}$	Prob(School Absenteeism) $_{W5}$
	(1)	(2)	(3)	(4)	(5)
Externalizing Behavior Subscale Measure at Wave 1	0.9187** (0.2084)	1.6263** (0.2554)			
Internalizing Behavior Subscale Measure at Wave 1	0.7171** (0.2692)		1.2073** (0.2337)		
Disruptive in School at Wave 1				0.1649* (0.0762)	
Maternal Employment-Related Variables					
No. of months worked $_{W1,W5}$	0.0157 (0.0286)	0.0129 (0.0381)	0.0101 (0.0270)	0.0018 (0.0034)	-0.0003 (0.0022)
No. of involuntary job-to-nonemployment transitions $_{W1,W5}$	0.8559* (0.4044)	0.9450 <sup>†</sup> (0.5372)	1.1802** (0.3805)	0.1042* (0.0459)	0.0154 (0.0315)
No. of voluntary job-to-nonemployment transitions $_{W1,W5}$	0.3709 <sup>†</sup> (0.1953)	0.4561 <sup>†</sup> (0.2640)	0.3187 <sup>†</sup> (0.1843)	0.0378 <sup>†</sup> (0.0218)	0.0184 (0.0142)
No. of voluntary job-to-job transitions $_{W1,W5}$	-0.0171 (0.2713)	-0.0513 (0.3596)	0.1922 (0.2565)	-0.0375 (0.0308)	-0.0071 (0.0225)
$\Delta$ Full-time work hours $_{W1,W5}$	1.2412** (0.4468)	1.2201* (0.5906)	0.9504* (0.4217)	0.0431 (0.0497)	0.0356 (0.0341)
$\Delta$ Full-time work hours $_{W1,W5} \times \Delta$ Reading/writing/computer use $_{W1,W5}$	-1.9351 (1.1753)	-2.1191 (1.5574)	-1.6908 (1.1069)	-0.1181 (0.1302)	-0.2443 <sup>†</sup> (0.1249)
No. of years spent working fluctuating hours $_{W1,W5}$	0.5803* (0.2815)	0.6164 <sup>†</sup> (0.3731)	0.6314* (0.2723)	-0.0096 (0.0317)	0.0583** (0.0213)
Number of Children	280	278	278	298	360

*Notes:* Standard errors are shown in parentheses. All models include controls for Wave 1 of child outcome; changes in gender, child age, maternal education, home literacy environment scale, family structure, and father involvement in child rearing; whether the mother experienced a change in reading/writing/computer skills used on the job between Waves 1 and 5; and whether the mother worked between waves. These effects are suppressed in the table to conserve space.

<sup>†</sup> $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$

conditions.<sup>6</sup> Compared with changing jobs by choice, being laid off or fired leads to significantly greater (roughly 2–4 times greater) child behavior problems, particularly internalizing behavior problems, and to a greater likelihood that the child is disruptive in school. For example, although an additional voluntary job-to-nonemployment transition is associated with a 4 percentage point increase in the likelihood of the child being

<sup>6</sup> A significant minority of mothers experienced numerous job transitions, both between any pair of survey waves and across the entire study period (e.g., 25% of the mothers experienced four or more episodes of job instability). Among sample mothers, 35% lost a job due to being fired or laid-off at least once during the seven-year study, and 10% lost two or more jobs for such involuntary reasons. The median job duration was 7 months, and only one-third of jobs lasted a year or more.

**Table 6** The longer-run impacts of maternal employment patterns on the likelihood of grade repetition and placement in special education: WES 1997–2003

Maternal Employment-Related Variables	Probit Models (Marginal Effects)	
	Prob(Ever Repeated a Grade) <sub>W4–W5</sub> (1)	Prob(Ever Placed in Special Ed.) <sub>W4–W5</sub> (2)
No. of Months Worked <sub>W1,W4</sub>	0.0070* (0.0032)	–0.0015 (0.0016)
No. of Involuntary Job-to-Nonemployment Transitions <sub>W1,W4</sub>	0.0374 (0.0602)	0.0031 (0.0344)
No. of Voluntary Job-to-Nonemployment Transitions <sub>W1,W4</sub>	0.0417** (0.0159)	–0.0092 (0.0098)
No. of Voluntary Job-to-Job Transitions <sub>W1,W4</sub>	0.0271 (0.0212)	–0.0245† (0.0135)
Δ Full-Time Work Hours <sub>W1,W4</sub>	0.1191** (0.0335)	0.0503* (0.0198)
Δ Full-Time Work Hours <sub>W1,W4</sub> × Δ Reading/Writing/Computer Use <sub>W1,W4</sub>	–0.1320† (0.0709)	–0.0584 (0.0469)
No. of Years Spent Working Fluctuating Hours <sub>W1,W4</sub>	0.0308† (0.0176)	0.0170† (0.0101)
Two-Year Average Transition Probability (conditional on not occurring in prior periods)	.1254	.1381
Number of Children	332	338

*Notes:* Standard errors are shown in parentheses. The models are conditional on the event not occurring in prior periods. All models include controls for gender; changes in child's age, maternal education, home literacy environment scale, family structure, and father involvement in child rearing; whether mother experienced a change in reading/writing/computer skills used on the job between Waves 1 and 4; and whether the mother worked between waves. These effects are suppressed in the table to conserve space.

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

disruptive in school at Wave 5, being laid off or fired is associated with a 10 percentage point increase in the probability of being disruptive in school at that time.

Additionally, children whose mothers experienced two involuntary job separations have about 0.50 of a standard deviation higher behavior problems compared with children whose mothers had never been fired or laid-off during the study period (effect sizes of 0.41, 0.31, and 0.60 of a standard deviation in the total behavior problems index, externalizing scale, and internalizing scale, respectively).

As shown in Table 5, we also find that the number of years spent working in jobs with fluctuating schedules has significant impacts on child internalizing and externalizing behavioral issues over time (controlling for the child's relevant initial assessment of each outcome at Wave 1). In particular, an additional two years of exposure to mother's fluctuating work hours leads to about 0.30 of a standard deviation increase child behavior problems by the end of the survey.

Table 5 also shows that working full-time in jobs that require more cognitive skills is not associated with children's behavior problems. However, full-time work in jobs

that do not require those cognitive skills is associated with significantly worse child behavioral outcomes.

Finally, looking at longer-run school-related outcomes (Table 6), increases to full-time work between Waves 1 and 4 while working in jobs that do not require more demanding cognitive skills is associated with roughly a 12 percentage point increase in the probability of repeating a grade and a 5 percentage point increase in the probability of placement in special education (the average two-year transition probability for each of these outcomes is roughly 13%). In contrast, increases to full-time work status between Waves 1 and 4 while working in jobs that do require more cognitive skills were not significantly linked with these outcomes.

Table 5 also shows that an additional year spent working fluctuating hours is associated with a 6 percentage point increase in the likelihood of school absenteeism problems at the end of the study, and Table 6 indicates about a 3 percentage point increase in the probability of repeating a grade and a 2 percentage point increase in the probability of being placed in special education. Thus, the longer-run impacts of mothers' fluctuating work hours are associated with a 24% increase in the likelihood of a child repeating a grade and a 12% increase in the likelihood of a child being placed in special education between Waves 4 and 5 of the study.

### Analyses by Subgroup

We also examined whether the consequences of maternal employment patterns for children differ for subgroups defined by race, age (e.g., preschool, ages 6–11, adolescence), gender, and family structure; we did not see significant differences across outcomes for these subgroups. However, this analysis was limited by small sample sizes.

### Assessing the Role of Selection Bias

Our primary regression estimates were obtained from child fixed-effects models that control for unmeasured time-invariant child and family characteristics. The OLS results that exclude these controls, as in Table 3, yielded similar patterns of results, providing some evidence that the presence of unobservable characteristics are not significantly biasing our results. But there may still be unmeasured, time-varying factors that bias our estimates. To assess the likely importance of time-varying factors, all models were reestimated, including the richer set of covariates described earlier. Estimates from these models (Tables A2–A5 in Online Resource 1) are very similar to our main specifications. The fact that these other covariates were unable to explain the associations between maternal employment patterns and children's well-being suggests that these linkages are due to unmeasured aspects of mothers' time or perhaps the organization of family time that matter for children's well-being and that are influenced by mothers' work.

### Additional Robustness Checks

A series of additional model specification tests examined potential selection and reverse-causality issues. In particular, we tested for the effect of future maternal employment



patterns on current period changes in child behavior. A nonzero correlation would suggest that the maternal employment pattern is correlated with child-specific growth rates of problem behaviors and/or transitory changes in child outcomes (which would raise concerns about reverse causality). We found no effect.

Our primary first-difference model specifications assume that contemporaneous changes in maternal work patterns matter most for child outcomes. Alternative model specifications could estimate the effects of both the prior history of maternal employment patterns and the pattern experienced during the most recent period. We added lagged maternal employment patterns (occurring prior to the most recent wave) in the OLS, first-difference, and long-difference specifications and found that the lagged employment pattern variables were jointly insignificant in each model, while the statistical significance and magnitudes of the main maternal employment pattern measures for the contemporaneous period were essentially unchanged. Other analyses tested the timing of children's responses to maternal employment patterns and found that maternal employment patterns in the recent 12 months are the strongest predictors of the child outcomes examined here.

## Discussion and Conclusion

This study uses a range of empirical approaches to examine how maternal employment patterns influence children, taking into account the considerable variation in low-income mothers' work experiences. This variation reflects the experiences of mothers with positive trajectories that include stable work, good wages, and upward mobility; but also mothers whose experiences are decidedly less positive, among whom job instability, low wages, and nonstandard work conditions prevail.

The findings suggest a detrimental association between children's behavior and mothers' job instability (in the form of job-to-nonemployment transitions), full-time work hours, and fluctuating work hours. Our results are consistent with mounting evidence that parental job instability has adverse consequences on children's behavior, academic achievement, and their subsequent adult employment outcomes, particularly in economically disadvantaged families (Hill et al. 2010; Kalil and Ziol-Guest 2008; Oreopoulos et al. 2008; Randolph et al. 2004). The magnitude of the impacts of maternal job instability and fluctuating work hours is large. For comparison, the study most similar to ours is that by Hill et al. (2010); their estimates imply that a single job loss increases the problem behavior of children by about half of a standard deviation; our estimates are sizable, although quite a bit smaller. This pattern of results was consistent across a variety of specifications, bolstering our confidence in the findings and providing suggestive evidence that our results are not driven primarily by unobserved heterogeneity.

The adverse associations related to full-time work are consistent with the notion that maternal time constraints impede the opportunity to promote positive child adjustment. However, our analyses reveal that the negative consequences of long work hours are completely offset when this work experience is in jobs that require the cognitive skills that lead to higher wage growth prospects. These associations may be driven by the actual growth in wages in these jobs or by other aspects of such demanding jobs.

While these results suggest a potentially important role for maternal employment patterns in influencing children's development, the major remaining challenge is to understand precisely why and how this is so. Providing further understanding of the process by which maternal employment patterns may influence child development could help shed light on additional work supports that may effectively reduce the costs of maternal employment. Inspecting the mechanisms is an important and fertile area for future research.

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