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Abstract

Although many studies have investigated links between maternal employment and children's wellbeing, less research has considered whether the stability of maternal employment is linked with child outcomes. Using unique employment calendar data from the Fragile Families and Child Wellbeing Study (N=2,011), an urban birth cohort study of largely low-income families, this paper investigates whether the stability of maternal employment in early childhood (birth to age 5) is linked with child behavior and cognitive skills at ages 5 and 9. Employment stability (continuous employment over all 5 years, low levels of job churning, longer job tenure) was linked with less child externalizing behavior, but there was little evidence to suggest stability was particularly important for PPVT and Woodcock-Johnson scores. Rather, for PPVT and Woodcock-Johnson scores, an increase in maternal employment in early childhood more generally was associated with higher scores.

Keywords: Maternal Employment, Fragile Families, Employment Stability, Cognitive Skills, Behavioral Skills

Maternal employment has increased dramatically over the last 40 years, especially among mothers with children under the age of 6. In 2015, 64% of mothers with children under 6 were in the labor force compared to 39% in 1975 (Bureau of Labor Statistics 2009, 2016). The rise in maternal employment among economically disadvantaged groups has been even greater, in part as a result of welfare reform, expansions of the Earned Income Tax Credit, and child care subsidies (e.g. Blank & Haskins, 2002). These dramatic shifts in maternal labor force participation have prompted many studies investigating the links between maternal employment and child wellbeing. These studies have yielded mixed findings, due to differences in sample populations (middle versus low-income), methodological approaches, the developmental age of the children, or aspects of maternal employment being studied, such as work schedules or hours (Goldberg, Prause, Lucas-Thompson & Himsel, 2008).

One relatively understudied aspect of maternal employment that might matter for child development is employment stability. Stability of maternal employment may be particularly important for child wellbeing, to the extent that more stable employment is linked with greater economic resources, less disruption of maternal socioemotional resources or parent-child interactions, and fewer disturbances to family routines or supports, such as child care or health insurance, all of which have been shown to influence child wellbeing. Studies of employment stability have largely focused on job loss (or instability), and found that job loss is linked with poorer child outcomes (e.g. Brand & Thomas, 2014). But other forms of employment stability, beyond job loss, might also be important. Stability measured as consistency in employment over time (whether in the same job or not), number of job transitions, or length of time in the same job, might also matter for child development, and far less is known about whether these forms of employment stability are linked with children's outcomes. From a policy perspective, understanding whether maternal employment stability, and what type of stability, matters is key in thinking about how to better craft public policies that promote work and support child development.

Using unique employment calendar data on mothers in the Fragile Families and Child Wellbeing Study (FFCWS; N=2,011), a birth cohort study of predominantly low-income families, we examine maternal employment stability over the first 5 years of the child's life and links with child behavior and cognitive skills at ages 5 and 9. Many of the FFCWS families are low-income, a group that may be particularly vulnerable to instability in employment, as they may be less well positioned to cushion economic shocks (i.e. low levels of savings, Scholz & Seshadri, 2009). This group has also experienced the largest increase in maternal employment in recent decades (Blank & Haskins, 2002; Johnson & Corcoran, 2003). We focus on early childhood (birth to age 5), a critical developmental time period when important brain development and early learning is occurring that is highly predictive of later academic and economic success, and may be particularly vulnerable to levels of household resources (Elder, 1998; Heckman, 2006; Hair, Hanson, Wolfe & Pollak, 2015). We add to earlier literature by considering employment stability over a 5-year period, focusing on one developmental time period, early childhood, examining multiple measures of employment stability, and using data that represent a greater range of low-income mothers than prior research.

We begin by reviewing theory on the links between maternal employment stability and child wellbeing. We then briefly summarize the considerable body of research regarding links between maternal employment and child wellbeing, focusing particularly on the literature that considers employment stability, early childhood, and lower-income families.

How Might Maternal Employment Stability be Linked with Child Well-Being?

Developmental, sociological, and economic theories suggest that child outcomes are influenced by maternal employment primarily through income, time and parenting, psychological wellbeing, and child care. Maternal employment stability may alter these key inputs into child development in a way that either benefits or hinders child wellbeing. Parental investment theory would suggest that mothers with stable employment will have greater economic resources from

employment as compared to those with unstable employment, thereby promoting a mother's ability to purchase goods and services that are associated with beneficial outcomes for children (Becker, 1981). Maternal time, role strain, or family stress models (Conger & Elder, 1994; Presser, 2003; Yeung, Linver, & Brooks-Gunn, 2002) posit that economic insecurity, as a result of job loss or job instability, decreases child cognitive and behavioral skills as the economic insecurity disrupts maternal socioemotional resources (Raver, 2003; Henly & Lambert, 2014), and impacts parent-child interactions (Coley & Lombardi, 2014). Related is household chaos theory (Wachs & Evans, 2010), which suggests that unstable employment may disturb family routines or result in moves, creating chaos in the household, which in turn negatively impacts child development. Instability in employment or wages may also result in inconsistent access to governmental supports, such as health insurance or food stamps (Hill, Morris, Gennetian, Wolf, & Tubbs, 2013), and child care use, resulting in lower quality and less stable care (Lowe, Weiser, & Geis, 2003), which is associated with poorer behavioral outcomes for children (Tran & Weinraub, 2006). Although on average, instability is likely to lead to poorer child outcomes, instability could lead to positive child wellbeing if, for example, a job change results in mothers obtaining better quality or more stable employment. Similarly, a job loss could provide mothers with additional time to invest in their children, which might lead to positive outcomes.

Last, the link between stable employment and child wellbeing might, at least in part, reflect selection. Mothers who select into stable employment may be those mothers who have better characteristics, say more prior work experience, higher levels of education, better genetic endowments, or more motivation than mothers who have more unstable employment, all of which may be correlated with positive outcomes for children. Although we address selection in a few ways, by including an extensive set of covariates and a number of robustness checks (lagged dependent variable and fixed-effects models), we cannot rule out selection.

The link between maternal employment stability and child outcomes may be particularly important in early childhood. Life course theory (Elder, 1998) posits that early childhood is a particularly important time period for child development as key brain, socioemotional, and physical development is occurring during this time period that can influence long-term development (Heckman, 2006; Hair et al., 2015). Emotional, social, and economic resources, those that are influenced by maternal work stability or job intensity, are especially important for early skill development and longer-term child wellbeing (Coley & Lombardi, 2014). For young children whose parents work, child care plays a particularly critical role, but it may be difficult to access or afford (Cabrera, Hutchens & Peters, 2006).

There are also reasons to expect that employment stability is especially important for lower-income families. Welfare reforms have changed the landscape of the social safety net, increasing the emphasis on work, yet many low-income women face instability in employment (Henly & Lambert, 2014). Disadvantaged mothers are also more likely to be in the labor force, have higher unemployment rates, and poorer employment trajectories, than more advantaged mothers (BLS, 2016; Pilkauskas, Waldfogel & Brooks-Gunn, 2016). Thus, employment, and employment stability, may play a particularly important role for low-income mothers and in turn their children.

Empirical Evidence

An extensive literature has examined the links between maternal employment and child wellbeing and has found both positive and negative links, as well as null findings (for reviews see Goldberg et al., 2008; Lucas-Thompson, Goldberg & Prause, 2010; Smolensky & Gootman, 2003; Waldfogel, 2006). Some differences in study findings may be due to variation in sample make up, methodological approaches, and types of employment being examined. Most consistent is the finding that employment in the first year of life is linked with poorer cognitive and behavioral outcomes for children, particularly when that employment is full-time in more advantaged families (e.g. Baydar & Brooks-Gunn, 1991; Brooks-Gunn et al., 2010). Studies focused on low-income families have found

few negative associations between maternal employment in the first year of a child's life and child outcomes (Berger, Brooks-Gunn, Paxon, & Waldfogel, 2008) as well as some positive associations (Coley & Lombardi, 2013; Fuller et al., 2002; Lombardi & Coley, 2014). Related research examining low-income mothers and their transition from welfare to work has generally found positive, or null findings (e.g. Chase-Lansdale et al., 2003; Dunifon, Kalil & Danziger, 2003). Last, experimental research on income and maternal employment has generally found that for young children, there are positive benefits to employment when coupled with an increase in income (Morris, Gennetian & Duncan, 2005), although some research found no benefits (Morris & Michalopoulos, 2003).

The link between child wellbeing and maternal employment may to differ by employment stability, as maternal economic, time, and socioemotional resources are likely to vary by employment stability (e.g. Goldberg et al., 2008). Stability can be defined in many ways, including changes in jobs, job loss, fluctuating job schedules, or income instability (for a review on job loss and unemployment, see Brand, 2015). Studies of job loss or employment transitions have found that parental employment loss is predictive of poorer outcomes for children (e.g. Brand & Thomas, 2014; Elder, 1974; Kalil & Ziol-Guest, 2005) especially among low-income children (e.g. Gyamfi, Brooks-Gunn & Jackson, 2001; Hill, Morris, Castells, & Walker, 2011; Johnson, Kalil & Dunifon, 2012). Job loss has also been linked with mediating mechanisms such as decreased responsive parenting (Raver, 2003), poorer mental health (Chatterji, Markowitz & Brooks-Gunn, 2013; Petterson & Albers, 2001), and lower quality child care (Lowe et al., 2003), which all in turn affect child wellbeing. Many studies have also documented how instability in income more generally matters for child development (Duncan & Brooks-Gunn, 1997; Hill et al., 2013; Yeung et al., 2002).

Examining stability requires data that captures employment over time. Although many longitudinal datasets measure employment, rarely is data collected about employment that occurs between survey waves. Thus, it is difficult to examine employment patterns over long periods of time. A few studies have examined longitudinal patterns of maternal employment and child

wellbeing focusing on lower-income samples. Lombardi and Coley (2013) used cluster analysis to sort women into employment patterns accounting for their intensity (number of months worked), work quality (wages and health insurance) and stability (number of job transitions and number of employed to unemployed transitions) over a 2-year period when children were ages 2 to 4, using data from Boston, Chicago and San Antonio. They found that high-quality stable employment was linked with improved cognitive and behavioral outcomes for children at age 9. Another study examined changes over a 2-year period in job stability (having the same job at both time points), work hours (full-time or fluctuating), involuntary job transitions and voluntary job transitions among a sample of low-income children in one county in Michigan (Johnson et al., 2012). The authors found that job loss was associated with poorer outcomes and that having the same job over time was associated with improved behavior (but this finding was not robust in change models). Last, a study of welfare recipients in one city explored differences in school performance by length of time employed or unemployed and found that longer time unemployed and longer time employed in the same job were both associated with higher performance, although stable employment was more strongly associated (Secret & Peck-Heath, 2004).

The Current Study

To study whether maternal employment stability in early childhood is linked with child socio-emotional and cognitive wellbeing, we examine three measures of employment stability (consistent employment over early childhood, increased months of employment within a job, and number of job transitions). We extend earlier research by examining employment stability over a longer time period – 5 years – during a critical developmental period, early childhood. The birth cohort data provide us with a large sample of children who are all the same age, rarely available in prior studies. We use data on children and mothers in 18 large U.S. cities, a wider range of low-income families than earlier studies, which focused on fewer geographical areas and exclusively on

welfare recipients. The children in this study were born shortly after welfare reforms that greatly affected maternal employment, making it of particular interest to researchers and policy makers.

Method

Data and Sample

The data come from the Fragile Families and Child Well-being Study (FFCWS), a longitudinal birth cohort study of largely low-income families. Approximately 5,000 births were randomly sampled from 75 hospitals in 20 large (populations over 200,000) U.S. cities between 1998 and 2000 with an oversample of nonmarital births (at a ratio of 3 to 1). Mothers and fathers were interviewed soon after the birth of the focal child and follow-up interviews were conducted when the child was approximately 1 (1999-2001), 3 (2001-2003), 5 (2003-2006) and 9 (2007-2010) years old.

This study uses data from a sub-sample of mothers and children who took part in an additional survey that was conducted at the year 5 follow-up. Mothers who had completed the core 5-year survey (n=4,139) were invited to take part in an additional, more in-depth survey (excluding mothers who were in 2 pilot cities, n=544). Of the 3,595 mothers who were invited, 3,001 participated in the additional phone survey but only 2,366 agreed to participate in the in-home interview where child assessments and the employment calendars used in the current study were administered. Of the mothers who participated in the in-home interview, 85% completed the employment calendar for a final analytic sample of 2,011.

Although when weighted, the FFCWS is representative of births in cities with populations over 200,000 between 1998 and 2000, the sample in this study is not generalizable to that population due to attrition and selection into the employment calendar. First there is attrition over time – of the 4,898 mothers who were interviewed at baseline, 4,139 were interviewed at year 5. Comparing those mothers remained in the sample (using t-/chi-square tests), to those who attrited, shows that attriters were more likely to be Hispanic (32% vs. 26%), immigrants (29% vs. 15%), to have less than a high school degree (45% vs. 39%) and to not have worked before the birth of the child (70% vs. 77%).

When we compare the 4,898 mothers who were interviewed at baseline to the 2,011 mothers who participated in the employment calendar we again see that those who did not participate were more likely to be Hispanic (29% vs. 25%), immigrants (20% vs. 12%) and were less likely to have worked before birth (74% vs. 79%). Second, there was selection between the 1,584 mothers who were interviewed by phone at year 5 and eligible to participate but did not, and the 2,011 mothers who did participate in the employment calendar. Comparisons show that employment rates at the year 5 core interview were similar across these two groups (61% and 59% respectively), but mothers who participated in the employment calendar were significantly less likely to be white (20% vs. 24%), to have a college education (10% vs. 13%), to be stably married over the 5- year period (24% vs. 33%), and were significantly more likely to experience at least one wave of poverty (74% vs. 66%). All other characteristics, including those of the children, were very similar. Last, although we conducted multiple imputation for children missing values on year 9 outcomes (described below), some mothers who participated in the year 5 calendar attrited at the year 9 interview (n=245). Examining differences between the 245 mothers who left at year 9 and the 1766 who remained, shows that attriters were least likely to be employed, had fewer months of employment (32 vs. 37 months), were more likely to be Hispanic (35% vs. 24%), younger (24 vs. 25 years), had lower levels of education (54% less than high school vs. 36%), higher levels of poverty (1.7 poverty ratio vs. 2.3), lower cognitive scores (6.2 vs. 6.9 WAIS), higher impulsive behavior scores (2.2 vs. 2.0) and were less likely to be married (13% vs. 22%) than those who did not attrite.

To retain as large a sample as possible, we conducted multiple imputation with chained equations (Allison, 2002). We generated 20 imputations using Stata 14. Missingness on covariates was minimal between .5 and 5% missing data. Missingness on the age 5 outcome variables varied by measure (ranging from 1.5% - 5% missing) and for the age 9 outcomes missingness was higher (due to attrition outlined above – about 12%). We present models where we imputed data for all missing covariates and outcomes (both at ages 5 and 9) to present the largest sample. We tested the

robustness of the imputation and findings in two ways. First, we limited our analyses only to observed (unimputed) outcome variables and found similar findings to the analyses with imputed outcomes. Second, we ran all models using listwise deletion (deleting all missing outcomes and covariates) and again found very similar results to the fully imputed model.

Table 1 describes the sample who participated in the employment calendar (we do not weight the data due to sample selection described earlier). Approximately 36% of mothers had an income below the Federal poverty line and another 28% had incomes below 200% of poverty. The sample was also racially and ethnically diverse (52% non-Hispanic Black, 20% non-Hispanic White and 25% Hispanic). Thirty-nine percent of the mothers had less than a high school education, and 10% had college degrees. Only 21% of mothers were married at the time of the birth of the child. Most mothers (79%) worked before the birth.

Measures

Maternal employment stability. The employment calendar asked mothers to detail the start and end time of each job that lasted more than 2 weeks since the birth of the focal child through the date of the 5-year interview. Using a visual aid, interviewers recorded mother's jobs on a calendar with an arrow to indicate the time mothers spent in each job. We constructed measures of employment stability from the birth of the focal child through age 5 using these employment calendars. To our knowledge, these data are unique in providing employment data over all of early childhood; although other large datasets (e.g. NLSY or PSID) capture longer employment data, they are limited in their measures of child outcomes, require researchers to mix children of different developmental ages in order to obtain adequate samples, and have fewer low-income mothers.

The longitudinal employment stability measures tap into different aspects of employment stability that might matter for child development. First, we constructed a measure indicating the number of months mothers were employed over the 5-year period ("months of employment"; range 0-74 months). If mothers were employed in more than one job in the same month, we only recorded

one job per month. We examined this measure linearly (as a continuous measure) and using dummy indicators to indicate the number of months worked equivalent to years (0 months, 1-11, 12-23, 24-35, 36-47, 48-59, and 60+). Second, we examined employment stability by considering job churning, or the number of number of jobs mothers reported working for 2 weeks or more over the 5-year period ("number of jobs"; range 0-10).

These measures allow us to examine aspects of employment stability that may be particularly consequential for child development. First, when the number of months employed is entered linearly it is a measure of increased time in employment. Second, when the number of jobs is included as a control in the model (or held constant), the measure of the months of employment taps into an increase in the months employed within the same job, another measure of stability. Third, the number of jobs is itself a measure of employment stability. Fourth, when entered as dummies, we can examine employment stability by comparing whether mothers who work all of early childhood (say 60+ months, or consistently), to those who worked fewer months.

We also conducted a series of robustness checks (lagged dependent variable and individual fixed-effects). For those analyses we constructed measures of the months employed and number of jobs between ages 1 and 3, and the same set of measures for employment between ages 3 and 5.

Child behavior. Mothers reported on child externalizing and internalizing behaviors at age 5 using the Age 4-18 Child Behavior Checklist (CBCL; Achenbach, 1991). Externalizing behavior was assessed using the aggressive and delinquent behavior subscales of the CBCL and included items such as anger, defiance or disobedience, or destroying things (31 items, α=0.87). Internalizing behavior included two subscales – anxious or depressed, and withdrawn behaviors (22 items, α=0.76). These subscales measure items such children's sadness, nervousness, affection and interest. Responses to each item were summed (*0=not true of my child; 1=sometimes/ somewhat true; 2=very/often true*) to create a scale and then standardized to have a mean of zero and standard deviation of one. Higher scores reflect more behavior problems. The year 9 analyses used

externalizing and internalizing behaviors measured with the Age 6-18 CBCL (Achenbach & Rescorla, 2001). Externalizing behavior was assessed at year 9 with the aggressive and rule-breaking subscales (35 items, α=0.91). Internalizing behavior at year 9 was assessed with the anxious/depressed, somatic problems, and withdrawn behavior subscales (32 items α=0.88). The lagged dependent variable and individual fixed-effects models also made use of child externalizing and internalizing behaviors at age 3 using the aggressive and destructive subscales for externalizing (22 items, α = 0.88; Achenbach, 1991) and the anxious/depressed and withdrawn subscales for internalizing behavior (25 items, α=.76).

Child cognitive skills. Child cognitive skills at age 5 were assessed using the Peabody Picture Vocabulary Test (PPVT) and the Woodcock-Johnson (WJ) Letter-Word Recognition Test. Both tests were administered to children by interviewers. The PPVT measured children's receptive vocabulary and verbal ability and the WJ assessed children's word identification skills and ability to name letters. Children's test scores were standardized (mean 0, SD 1) so that higher scores reflect higher cognitive skills. Models examining year 9 outcomes used the PPVT version IIIA. Two WJ tests were administered at year 9: the WJ Passage Comprehension (subtest 9), which assessed symbolic learning (matching a picture to an object), multiple-choice format questions, and short passage comprehension, and the WJ Applied Problems (subtest 10) centered on analyzing and solving math problems. The lagged dependent variable and individual fixed-effects models also used the PPVT scores from the age 3 assessment. The WJ was not administered at age 3.

Covariates. To control for factors that might be correlated with selection into employment and that might otherwise bias our estimates, we included an extensive set of covariates that have been theoretically or empirically linked with both maternal employment and child behavioral or cognitive outcomes in prior research (e.g. Berger et al., 2008; Johnson et al. 2012). Most covariates were measured at the baseline survey and thus predate the measures of employment and child wellbeing. A handful of covariates that were assessed at a later wave but that may be considered an unchanging

characteristic, such as mother's cognitive score, were also included. Covariates were entered into the model in steps to demonstrate their impact on the key variables of interest.

First, demographic and background characteristics of the mother were entered as covariates including: mother's race or ethnicity (coded as non-Hispanic White, non-Hispanic Black, Hispanic, or other race or ethnicity), education (coded as less than high school, high school, some college, or college), age at the birth (<20, 20-24, 25-29, 30-34 or 35+), mother's relationship status at the birth (married, cohabiting, single), immigrant status (indicator for foreign born), whether the interview was conducted in Spanish, birth order of the focal child (first, second, third or higher order birth), number of children in the household (related or not), whether a grandparent of the child was coresident at birth, income-to-needs ratio at birth (using official US Census bureau's thresholds adjusted for household size and year), whether the mother worked in the year before the birth, maternal grandmother's education (less than high school, high school, some college, college) and an indicator for maternal grandfather's education differing from the maternal grandmother.

Second, child characteristics were entered into the model and included: child is a boy, was born low birth weight, had a physical disability (measured at year 1), the baby's temperament (asked of the mother at year 1 about things like fussiness, crying, and getting upset, α=.60), and the child's age at the year 5 survey (as there was some variation in the timing of the year 5 interviews). Third, additional mother characteristics, those not typically available in survey data were included: mother's cognitive score (assessed by the Weschler Adult Intelligence Scale – Revised at year 3), her impulsivity score (a 6-item scale assessing self-control administered at year 3, α=.84), and substance use (an indicator of a drug or alcohol problem that interfered with mother's life). Last, city dummies (city fixed-effects) were added to the model. By including city fixed-effects we control for city level factors that might influence mother's employment opportunities (e.g. the labor market, public policy) and child outcomes (e.g. public pre-k availability). We examined collinearity among the control variables and did not find any problems with collinearity (a handful of variables such as first and

second birth had correlations over .5 but that is to be expected as they are constructed in relation to each other). A correlation table is available in Supplemental Table 1. The variance inflation factor for the full model was 1.6 and none of the individual variables were higher than 2.5.

Additional controls measured over time. To examine whether the findings were being driven by unmeasured covariates, we also added a number of other controls that were measured over time. Although most of the additional variables included might be considered endogenous, we tested the inclusion of these variables because they likely affect both maternal employment and the child outcomes. In many ways, the inclusion of these additional time varying covariates might be thought of as a mediation analysis; however, because these variables are measured at the same time as employment patterns, we consider this a robustness check rather than a formal mediation analysis.

First, we examined some additional characteristics about the family and mother. These included maternal relationship status between the birth and age 5, coded as stably married (married birth through age 5), stably cohabiting, stably single, unstable married (married at some point), or unstable cohabiting (cohabited at some point), a control for whether a new child was born between age 1 and age 5, and a control for whether the mother ever reported having a health problem that limited her ability to work in this time period.

Second, we examined a number of economic variables, because mothers who work, and work stably, are likely to have higher earnings and household income, which are positively linked with child outcomes (e.g. Duncan & Brooks-Gunn, 1997). We constructed a measure of poverty at each wave to identify households at or under 100% of poverty. We then created a series of variables indicating the number of waves the household experienced poverty (0-4). We also investigated material hardship (10 items measuring whether households experienced any food insecurity, housing insecurity, inability to pay bills, foregone medical needs or had utilities cut off; $\alpha = 0.72$), which was defined as the average level of hardship over the 3 survey waves.

Third, we included aspects of parenting and the home environment that might be affected by maternal employment, and which may also be associated with child outcomes. These included maternal depression, parenting stress, parenting time spent in enriching activities, and spanking, all of which have been found in prior research to be associated with child wellbeing (Petterson & Albers, 2001). Maternal depression was assessed (using the Composite International Diagnostic Interview – Short Form; Kessler, 1988) at each wave to determine whether the mother reported experiencing a major depressive episode (dysphoric mood or anhedonia) using the conservative estimate of likely being diagnosed as depressed. We then created a measure indicating the number of waves she was depressed (0-4). Parenting stress, a 4-item scale assessing things like "parenting is harder than I thought it would be" (α =0.78), was included as an average of the parenting stress measures over the 3 survey waves. Parenting time in enriching activities, a 5-item parenting activities scale assessing items like reading and singing to the child (α =0.74) was included as the average of the scores over all survey waves (following Carlson, Pilkauskas, McLanahan, & Brooks-Gunn, 2011). Maternal spanking was coded at each survey wave (yes/no) and was included as the number of waves (0-4) that mothers reported any spanking.

Last, a code was constructed to identify children in center-based care, since child care use varies by maternal employment status and stability, and has been linked with cognitive and socioemotional outcomes (e.g Belsky et al., 2007). Children who attended center-based care (including center-based pre-kindergarten) at years 1, 3 or 5, were coded as having had some center-based care. In supplemental analyses we separated out pre-kindergarten from other center-based arrangements and number of waves in center-based care and the findings were unchanged.

Analytic Approach

We used ordinary least squares (OLS) regressions with a rich set of covariates to assess the associations between the various measures of maternal employment and child outcomes. As noted in the measures section, we entered these vectors of covariates into the models progressively. First, we

explored how an increase in the months of maternal employment between birth and age 5 was associated with child outcomes using the following model:

$$Y_{it5} = \beta_0 + \beta_1 MonthsEmp_{it0\text{-}5} + \beta_2 X_{it0} + \beta_3 City_{it0} + \varepsilon_i \quad (1)$$

where Y_i is the outcome of interest (externalizing, internalizing, PPVT, WJ) for child i at time t (here t5 indicates outcomes at year 5), *MonthsEmp* is an indicator for months of maternal employment between birth and age 5 (labeled t0-5 for birth to age 5), *X* is a vector of demographic, background, child and mother characteristics and *City* is a set of city fixed-effects. This analysis explores the association between a one month increase in maternal employment between birth and age 5 and child outcomes at age 5.

We then examine two measures of employment stability in equation 2. First, this model explores holding the number of jobs worked constant, whether a one month increase in the number of months employed – essentially a one month increase within the same job – is associated with child outcomes, a measure of employment stability. Second, this model examines whether an increase in the number of jobs worked (an increase in instability/job churning) in early childhood (holding the number of months worked constant) is associated with child outcomes.

$$Y_{it5} = \beta_0 + \beta_1 MonthsEmp_{it0\text{-}5} + \beta_2 NumberJobs_{it0\text{-}5} + \beta_3 X_{it0} + \beta_4 City_{it0} + \varepsilon_i \quad (2)$$

where *NumberJobs* indicates the number of jobs mothers worked between birth and age 5. We did not examine the number of jobs measure independently as this measure is only really meaningful relative to the total time in the workforce. For example, the effect of three job transitions for a mother who worked for one year is likely very different than three transitions for a mother who worked for 5 years.

Next as detailed in equation 3, we ran a model where months of employment was broken out into years (non-linearly):

$$Y_{it5} = \beta_0 + \beta_1 1\text{-}11Emp_{it0\text{-}5} + \beta_2 12\text{-}23Emp_{it0\text{-}5} + \beta_3 24\text{-}35Emp_{it0\text{-}5} + \beta_4 36\text{-}47Emp_{it0\text{-}5} + \beta_5 48\text{-}59Emp_{it0\text{-}5} + \beta_6 60Emp_{it0\text{-}5} + \beta_7 X_{it0} + \beta_8 City_{it0} + \varepsilon_i \quad (3)$$

where *1-11Emp* indicates 1-11 months of employment, *12-23Emp* 12-23 months of employment, *24-35Emp* 24-35 months, *36-47Emp* 36-47 months, *48-59Emp* 48-59 months, and *60Emp* 60 or more months of employment. The excluded category was no employment in the first 5 years of life. This model allows us to examine whether the association between stable/consistent employment (60+ months, or nearly stable, 48+ months) and child outcomes differs from fewer months of employment. Wald tests were used to examine statistically significant differences ($p<0.05$) between the highest levels of employment and the lower levels of employment. We also ran equation 3 including a control for number of jobs.

Exploring maternal employment stability in early childhood and child outcomes at age 5 is our main model of interest. However, we also explored whether the observed associations between months of employment and employment stability between birth and age 5 remained when we examined child outcomes at age 9 (Y_{it9}). Equation 4 shows the model for the linear months employed (months within a job), controlling for the number of jobs, but we also explored breaking out years of employment with and without controls for the number of jobs.

$$Y_{it9} = \beta_0 + \beta_1 MonthsEmp_{it0\text{-}5} + \beta_2 NumberJobs_{it0\text{-}5} + \beta_3 X_{it0} + \beta_4 City_{it0} + \varepsilon_i \quad (4)$$

To test the robustness of our findings to alternate specifications, we also ran two additional specifications, a lagged dependent variable model (LDV, also known as a residualized change model) and an individual fixed-effects model. LDV models estimate the association between employment stability and child outcomes, holding constant the prior level of the outcome. These models account for unobserved maternal or child characteristics that affected the earlier outcome to reduce selection bias due to unmeasured child and family characteristics (see e.g. NICHD & Duncan, 2003 for more detail). The LDV model is shown in equation 5:

$$Y_{it5} = \beta_0 + \beta_1 MonthsEmp_{it3\text{-}5} + \beta_2 NumberJobs_{it0} + \beta_3 X_{it0} + \beta_4 City_{it0} + \delta_5 Y_{it3} + \varepsilon_i \quad (5)$$

where Y_{it3} is the lagged outcome variable from year 3 and $MonthsEmp_{it3\text{-}5}$ is months employed between years 3 and 5. This model serves as a robustness check on the OLS models, but the LDV

model is limited in that it can only examine maternal employment stability between ages 3 and 5 because lagged outcome measures are not available before age 3. These models also estimate a slightly different association; whether maternal employment stability is associated with a change in child outcomes, compared with the OLS models that examine whether maternal employment stability is associated with the level of child outcomes.

Last, individual (family level) fixed-effects models were run. Individual fixed-effects models estimate the effect of a change in employment stability on a change in the child outcome. These models help account for selection by using the mother/child in a previous time period as a control for themselves, capturing time invariant unobserved characteristics that are correlated with both employment and child outcomes (e.g. motivation). Equation 6 depicts the individual fixed-effects regression model:

$$Y_{i\Delta} = \alpha_i + \beta_1 \text{MonthsEmp}_{i\Delta} + \beta_2 \text{NumberJobs}_{i\Delta} + \varepsilon_i \quad (6)$$

where Y_Δ refers to a change in the outcome between years 3 and 5, $MonthsEmp_\Delta$ is the change in months employed between years 1-3 and years 3-5, $NumberJobs_{i\Delta}$ is the change in the number of jobs mothers had between years 1-3 and years 3-5, and α_i are the individual fixed effects. Again, these models serves as a robustness check on the OLS models. These fixed-effects models are limited in that they can only examine short-term stability (a 2-year period) and they assume that the effect of employment stability between ages 1 and 3 compared to stability at ages 3 and 5 is the same. The fixed-effects models are change models, so they explore how a change in short-term stability of employment is associated with a change in child outcomes as compared to the OLS models that examine a longer time period (5 years) and levels rather than change.

Results

Descriptive Statistics: Maternal Employment Stability From Birth to Age 5

Table 1 provides descriptive statistics on the measures of employment and employment stability. Mothers were employed on average for 36 months over the 5-year period (the average

length of time between the child's birth and the 5-year follow up survey was 64 months). But there was a great deal of variation in the amount of time mothers spent employed; 12% were never employed, 8% were employed for less than one year, 20% were always (or stably) employed and another 20% were employed for most of early childhood (48-59 months). Mothers, on average, held about 2.5 jobs over the 5-year period (19% held only one job and 12% had more than 5 jobs).

Is Maternal Employment in Early Childhood Associated with Child Outcomes at Age 5?

Months of Employment. In Table 2, we explore whether an increase in maternal time employed during early childhood is associated with the four child outcomes (the raw data plotting the months of employment and each of the four outcomes using a binned scatterplot is available in Supplemental Figure 1). In the first 5 columns we examine time employed during early childhood (equation 1 from the methods section). This model does not test employment stability, but focuses on whether greater employment during early childhood is linked with child outcomes. Starting with model 1, the uncontrolled model, we found that an increase in months of maternal employment in early childhood was significantly associated with fewer externalizing (-0.004***) and internalizing (-0.005***) behaviors and with higher PPVT (0.009***) and WJ (0.008***) scores. Once maternal demographic and background characteristics were controlled (model 2), most of the associations declined but remained statistically significant. Including controls for child characteristics (model 3) decreased the strength of the association across all outcomes and the association with internalizing behaviors no longer remained statistically significant. Interestingly the inclusion of additional maternal controls (cognitive score, impulsive behaviors, and substance use) did not affect the size of the associations, and only for internalizing behavior did the inclusion of city fixed-effects reduce the observed association. In the final fully controlled model (5), a one month increase in maternal employment in early childhood was significantly associated with a -0.003* standard deviation decline in externalizing behaviors, a 0.004*** standard deviation higher PPVT score and a 0.003*** standard deviation higher WJ score.

Months of Employment within a Job. Table 2 also presents results from the model exploring the linear model of months of employment including a control for the number of jobs mothers had in early childhood (equation 2 from the methods section). In this analysis, the month variable assesses an increase in maternal time within a job (because the number of jobs is held constant). In the fully controlled model (5) we found significant associations between months employed within the same job and less externalizing behavior (-0.004*** SDs), higher PPVT scores (0.003** SDs), and higher WJ scores (0.003* SDs). Tests of statistical difference showed that the change in the coefficient on months employed for externalizing behaviors (from 0.003* SDs to 0.004* SDs) once number of jobs was controlled was statistically significant ($p<0.01$), whereas this was not the case for PPVT or WJ.

In results detailed in Appendix Table 1, we ran an alternative specification of employment within a job using a measure of the length of the longest job a mother held in early childhood in months (range 0-74 months) and found nearly identical results to the models with months of employment controlling for number of jobs. A one-month increase in the length of the longest job in early childhood was associated with improved outcomes: fewer externalizing behaviors (-0.004** SDs), higher PPVT scores (0.003* SDs), and greater WJ scores (0.004** SDs).

Number of Jobs/Job Churning. We also explored employment stability as measured by number of jobs, or job churning in early childhood (again equation 2) in Table 2 controlling for the number of months of employment. In the fully controlled model (5) the number of jobs was only associated with externalizing behavior, not internalizing, PPVT or WJ. An increase in the number of jobs mothers held in early childhood was significantly associated with a 0.04* standard deviation higher externalizing behavior score.

In Appendix Table 1 we also explored breaking out the number of jobs into indicators (0, 1, 2, 3, 4, 5+). The findings were similar to those where jobs were entered linearly. An increase in the number of jobs held by mothers was only associated with externalizing behavior although Wald tests

showed no differences across the number of jobs coefficients (with one exception, the Wald test between having 1 job and 5 or more was significantly different).

Years of Employment. To further explore whether maternal employment stability was associated with child outcomes, we also examined the association when months of employment was broken out into years (equation 3) with and without a control for the number of jobs. This analysis allows us to examine whether the results differed for children whose mothers who were always (60+ months), or nearly always (48+ months) employed, from those with fewer years of employment. The full analyses are in Supplemental Tables 2-5. Figure 1 displays the results for the fully controlled model (5) that controls for the number of jobs held. Figure 1 plots the beta coefficients for each year of maternal employment and 95% confidence intervals. The comparison group (no employment) is plotted at zero.

Starting with externalizing behavior (panel A), there was a significant association between 45-59 months of employment (-0.24* SDs lower externalizing behavior) and a marginal association at 60+ months of employment (-0.18 SDs) but no association at the lower levels of employment. Wald tests showed that both the 48-59 and 60+ month coefficients were significantly (p<0.05) different from the lower levels of employment but not from each other. Consistent, or nearly consistent employment was associated with fewer externalizing behaviors, whereas lower amounts of employment, were not associated.

Panel B plots the results for internalizing behavior. As was the case with the linear specification there were no significant associations. Panel C examines the results for PPVT. For PPVT, the 24-35 month, 48-59 month and 60+ months of employment variables were all significantly associated with higher PPVT scores (coefficients of 0.21*, 0.27**, 0.21* SDs respectively). Wald tests showed that none of the coefficients were significantly different from one another. Consistent employment does not appear to be more strongly associated with PPVT scores as compared to lower levels of employment.

Last, Panel D plots the results for Woodcock-Johnson scores. All levels of maternal employment were significantly associated with higher WJ scores except 1-11 months and 35-47 months. Although the highest two levels of work, 48-59 months and 60+ months had the largest association (0.25** SDs and 0.29** SDs respectively), and the line is generally upward sloping, Wald tests showed that none of the coefficients were statistically different from one another. Again, we find little evidence to support the hypothesis that consistent employment is more strongly associated with WJ than lower levels of employment.

For both the PPVT and WJ, the figures are generally upward sloping (stronger association with higher levels of employment); however, the lines appear to flatten out somewhat around 12 months of employment suggesting there may not be a clear dose-response relationship. We note, however, that the sample in each year category is relatively small and standard errors are large, so it is difficult to draw strong conclusions from this analysis.

Are the Findings Robust to the Inclusion of Additional Covariates?

Prior research has demonstrated that maternal employment influences the economic wellbeing of families, the home environment, and parenting strategies, but also the kind of care children receive, which in turn are all associated with child outcomes (Chatterji et al, 2013; Coley et al., 2007; Coley & Lombardi, 2014; Gyamfi et al., 2001; Lowe et al., 2003). In Table 3, we examine whether the associations persist when additional covariates, such as economic or parenting characteristics, are included in the analyses. Here we focus on equation 2 from the methods section, the linear specification of employment controlling for the number of jobs (an increase in time within a job and job churning). The findings were very similar when we broke maternal employment into years (consistent employment) and when we did not control for the number of jobs (increase in months employed; results available upon request). For externalizing behavior, controlling for all of the measures together decreased the association between months of employment and externalizing behavior (from -0.004*** SD to -0.002 SD) and made the association only marginally significant,

and the association with the number of jobs no longer significant. For PPVT, controlling for the number of waves of poverty reduced the association to 0.001 SDs (from 0.003** SDs) and made the association insignificant, but interestingly, when all measures were controlled the association remained significant. None of the additional covariates explained the association with WJ.

In analyses not shown here, we also tested the robustness of our findings to the inclusion more covariates. First, we examined alternative specifications of income beyond waves of poverty and average material hardship included in Table 3. We explored the inclusion of: average household income-to-needs over the 5-years, average household income, and average household income adjusted by the number of people in the household (equivalized income). The associations remained significant and robust to the inclusion of these covariates. We also examined whether including an average of mother's earnings (taken from each survey wave as this data was not collected in the employment calendar) or a control for the biological father's employment (at each survey wave as no employment calendar was administered to fathers) changed the findings and they did not. Finally, because current employment status may be more predictive of child outcomes than employment over early childhood, we tested the inclusion of current maternal employment – at the age 5 interview – and found that its inclusion did not explain the observed associations.

In addition to testing additional economic variables, we also tested the inclusion of other measures, which might influence employment and child wellbeing. Including a measure of the number of waves that the mother had health insurance (although we do not know if it was tied to her employment) did not change our results. We also constructed an expanded measure of child's disability using information from later waves that detailed whether a child received Supplemental Security Income (because of a disability) and the substantive results did not change. At year 3, mothers and fathers reported on whether their own parents had ever had a major depressive episode. We tested the inclusion of these variables (separately and together) and the results were similar. Last, we ran some analyses including covariates related to fathers: father's impulsive behaviors, a count of

the number of waves fathers experienced depression, a measure of father's cognitive score (WAIS), and a measure of his level of education, none of which changed the substantive findings.

Are the Results Robust Alternative Modeling Strategies?

The links between maternal employment and child externalizing behavior, PPVT and WJ scores at age 5 were largely robust to the inclusion of many additional covariates, but there may still be unobserved characteristics of the mother or the child that are associated with her propensity to be employed and with the child's cognitive and behavioral skills, for example, her persistence, genetic factors, or how hard she works. For that reason, in Table 4, we present the results of two additional models that can help account for selection bias; a lagged dependent variable (LDV) model/residualized change model (equation 5) and an individual fixed-effects model (equation 6).

As noted in the methods section, the lagged dependent variable model can only examine employment stability between ages 3 and 5, thus, it is not directly comparable to the previous results, which examined birth through age 5. For that reason, in Table 4 we also include the results from analyses that examine employment from ages 3 to 5 that exclude the lagged dependent variable model. Table 4 presents the linear specification of maternal employment (with and with a control for the number of jobs).

Months of employment, months of employment within a job, and number of jobs between ages 3 and 5 were not associated with children's externalizing or internalizing behavior at age 5. Note, however, that the point estimates for externalizing behavior (-0.003 SD and -0.004 SD) were identical to those in Table 2, where maternal employment from birth to age 5 was examined. In the lagged model, the point estimates dramatically declined and remained insignificant for both externalizing and internalizing behavior. An increase in months of maternal employment was associated with higher PPVT scores (0.007*** SDs) and WJ (0.007*** SDs) that remained when number of jobs were controlled (0.007*** SDs and 0.008*** SDs respectively), although for neither outcome was the number of jobs significantly associated. In the lagged dependent variable model the

months employed between age 3 and 5 remained positive and significantly associated with higher PPVT scores (0.005* SDs in the model controlling for jobs) and higher WJ scores (0.007** SDs). Analyses separating out employment into years (akin to equation 3) were also run (available upon request) and the findings were similar to the linear models. Consistent employment was not significantly different from fewer years of employment in any of the LDV models.

Table 4 also presents the results from individual fixed-effects models that estimate a change in the number of months mothers were employed between ages 1 and 3 and ages 3 and 5. As was the case with the lagged dependent variable models, no associations were significant for externalizing and internalizing behaviors. An increase in the number of months employed in the two-year period between ages 1 and 3, and ages 3 and 5, was significantly associated with a 0.004* SD higher PPVT score and a 0.006* higher WJ score. However, once the number of jobs were controlled, the coefficient on months of employment was no longer significant, although the point estimates were very similar (0.004 SDs for PPVT and 0.005 SDs for WJ).

Do the Associations Persist Until Age 9?

In Table 5 we examine whether maternal employment between birth and age 5 continues to be associated with child behavior and cognitive outcomes at age 9. As we did for the outcomes at age 5, we explore all of the different measures of employment and employment stability in turn.

Months of Employment. Maternal employment in early childhood was associated with lower levels of externalizing behavior at age 9 (-0.003* SDs) and higher WJ scores on both passage comprehension (0.002* SD) and applied problems (0.004** SD). The association between months of employment and PPVT no longer remained at age 9.

Months of Employment within a Job. As was the case at age 5, the months of employment within a job was more strongly associated with externalizing behavior than just months of employment (-0.004** SDs). Unlike the null findings at age 5, at age 9, a one month increase in maternal employment in early childhood within a job (controlling for number of jobs) was associated

with a significantly lower (-0.004* SDs) internalizing behavior score at age 9 (the emergence of this finding may partly be explained because internalizing behaviors are more easily detected in 9 year olds). The association between months of employment within a job and PPVT was not significant and the association with WJ passage comprehension was only marginally significant (although the point estimate was the same as months of employment) and the association with applied problems remained (-0.004** SDs).

We conducted two additional analyses to test the robustness of these findings. First, although employment calendar information for mothers was not available between ages 5 and 9, a measure of employment at the age 9 interview was available. When mothers' employment at age 9 was controlled, the findings were unchanged except the association with internalizing behavior declined and became insignificant. Second, we examined whether employment in early childhood was associated with a *change* in child outcomes between ages 5 and 9 by adding the age 5 outcome as a control. In every model the magnitude of the coefficient was reduced (but in the same direction; e.g. the coefficient on externalizing behavior went from -0.004** to -0.003 SDs). Only the association with WJ applied problems remained significant (0.002* SDs).

Number of Jobs/Job Churning. With the exception of PPVT, number of jobs was not associated with child outcomes at age 9. However, a positive association between the number of jobs and PPVT scores emerged (i.e. more jobs were linked with higher PPVT scores).

Years of Employment. The pattern of findings for years of employment, comparing mothers who were consistently employed to those who worked less in early childhood were similar to those at year 5. In general, more years of employment were more strongly associated with child outcomes (fewer behavioral problems, higher cognitive scores) but the associations were not always significant. In none of the analyses was consistent employment over all of early childhood significantly different from fewer years of employment (using Wald tests).

Do the Associations Differ by Developmental Timing?

Prior research has found that the associations between maternal employment and child wellbeing vary by child's age, and in particular in very early childhood (e.g. Brooks-Gunn et al, 2010). To explore some differences by developmental timing we examined maternal employment at ages 1-3 as compared to employment at ages 3-5 on outcomes at age 5. These analyses are shown in Appendix Table 1. For ease of presentation, we only show the analysis with months of employment within a job and number of jobs, but the other employment measures are available upon request. Starting with months of maternal employment within a job from ages 1-3, an additional month of employment was significantly associated with improved externalizing behavior at age 5 (-0.007** SDs). Again, we found no associations with internalizing behavior. Months worked between ages 1 and 3 were significantly associated with higher PPVT scores (0.006* SDs) but not WJ scores (although the coefficient was positive, 0.004 SDs). In none of these models was the number of jobs associated with child outcomes. As noted in Table 4, the associations between months of maternal employment between ages 3 and 5 were significantly associated with higher PPVT and WJ scores at age 5, but not for externalizing and internalizing behavior (although the point estimate for externalizing behavior was similar in magnitude to earlier analyses). Although these analyses are only exploratory, they provide little evidence to suggest that there are large are developmental differences in the associations between these measures of maternal employment and child outcomes at age 5 as the patterns were generally similar.

Discussion

Using longitudinal data on a relatively low-income urban birth cohort of mothers and children, we investigated the links between the stability of maternal employment in early childhood and child behavioral and cognitive wellbeing. Unlike prior research we studied maternal employment over a 5-year period, encompassing all of early childhood, to examine links with child outcomes at ages 5 and 9. We compared multiple measures of maternal employment stability to explore whether a particular aspect of employment stability mattered for child outcomes: consistent employment over

all of early childhood, the number of jobs held/job churning, and an increase in months of employment within a job. In extensions we tested the robustness of our findings and explored differences by developmental timing of employment. Although we find that more months of maternal employment in early childhood are generally linked with improved outcomes (externalizing behavior and cognitive scores), only for externalizing behavior was there evidence that employment stability (months of employment within a job, number of jobs, consistent employment) may be more strongly associated.

Starting with externalizing behaviors, we found some evidence to suggest that stability in maternal employment may matter. Consistent employment, or employment of more than 48 months in early childhood, was associated with fewer externalizing behaviors, whereas lower levels of employment were not associated. Similarly, an increase in months of employment within a job (controlling for number of jobs) was associated with fewer externalizing behaviors and instability, or an increase in the number of jobs held in early childhood, was associated with more externalizing behavior. Although these associations were robust to the inclusion of time varying covariates, once all 10 time varying measures were included in the model, the associations were no longer significant. This suggests that some of the association may be explained through these additional measures, but none of them individually explained the association.

As an additional test of the robustness of the findings, we ran lagged dependent variable (LDV) models and individual fixed-effects models. Both models can control for potential omitted variables, factors that contributed to the lagged child outcome level or time invariant characteristics of the mother and child. In both the LDV models and the individual fixed-effects models, we found no significant association between months of maternal employment (controlling for number of jobs) and child externalizing behavior. Thus, we might conclude that the OLS models did not control for all factors associated with maternal employment stability and child outcomes. However, it is important to note that the LDV and individual fixed-effects models are not measuring the same type

of employment stability. The LDV examines a level of employment stability on a change in externalizing behavior, the fixed-effect model examines a change in stability on a change in externalizing behavior and the OLS examines a level of stability on the level of externalizing behavior. For this reason, comparing across these models is challenging. Similarly, the developmental timing of each model varies slightly as does the length of employment stability examined. The LDV examines employment stability between ages 3 and 5, the fixed-effects analysis explores stability between ages 1 and 3 on a change in stability between ages 3 and 5, and the OLS models examine all of early childhood (birth to age 5). Last, both the LDV and individual fixed-effects may be somewhat limited in their reliability due to variation and plasticity in child outcomes over time. It is also easier to more precisely measure child outcomes at later ages than at earlier ages, and although externalizing behaviors at ages 3 and 5 are relatively highly correlated, there is a great deal of change that occurs in children over time. Thus, it is difficult to determine whether there are truly no associations between maternal employment stability and externalizing behaviors, or whether the OLS models are picking up a true association. We therefore conclude there is weak evidence to suggest maternal employment stability is associated with improved externalizing behaviors.

Turning to internalizing behaviors, we found little to no evidence that maternal employment or maternal employment stability was associated internalizing behaviors at age 5. At age 9, however, we found an increase in months of maternal employment within a job was associated with fewer internalizing behaviors, although the estimates were imprecise. This association may be explained by the fact that many more children exhibit internalizing behaviors at age 9 than at age 5, and it is easier to measure this behavior in older children. Nonetheless, we believe there is little evidence to suggest that maternal employment stability is linked with internalizing behaviors.

For the cognitive scores, although we examined PPVT and WJ scores separately, the findings may reflect general or specific cognitive gains. In general, the findings for both PPVT and WJ were similar. An increase in months of employment in early childhood was associated with higher PPVT

and WJ scores at age 5, but there was little to no evidence to suggest employment stability as measured by months within a job, number of jobs or consistent employment mattered. Nor do we find a clear dose-response relationship between years of employment and cognitive outcomes, but small samples and large SEs make it difficult to draw strong conclusions. Further research is needed to better understand whether there is a particular amount of employment from which children may derive benefit. The findings for both cognitive tests were robust in the LDV and individual fixed-effects. For both the PPVT and WJ passage comprehension, the associations were no longer significant at age 9, but there was a positive association with the WJ applied problems test. One key difference between these two outcomes was when we controlled for the waves of poverty experienced by mothers. For PPVT but not WJ, the association declined and became insignificant, although the other income specifications we tested did not reduce this association. This suggests, that perhaps the association between maternal employment and PPVT is working through income.

In sum, we found an increase in months employed in early childhood was associated with less externalizing behavior, and higher PPVT and WJ scores for children at age 5, and some evidence to suggest that months within a job, number of jobs and consistent employment may matter for externalizing behaviors. But in general, the magnitude of the associations was modest. For externalizing behaviors, a one year increase in maternal employment in early childhood within a job (linear specification of months controlling for number of jobs – equation 2 with the full set of covariates) was associated with a -0.05 SD lower externalizing behavior score, or a 0.35 lower externalizing behavior score (a decrease from 13.0 to 12.7 points for the average child, or - 3%). A one year increase in maternal employment in early childhood (not controlling for jobs – equation 1 with the full set of covariates) was associated with a 0.044 SD higher PPVT score, or 0.58 points higher (an increase from 92.9 to 93.5 for the average child, or less than 1%). Using the same model for WJ, a one year increase in maternal employment was associated with a 0.041 SD higher score, or a 0.62 points higher (an increase from 99.4 to 100, or a less than 1% increase). Though these

associations are small, other factors, such as a two-point increase in mother's cognitive score or increasing household income-to-needs ratio at the birth by one point (e.g. moving from 1- to 200% of poverty), had similar associations with WJ scores.

It is difficult to compare our study with previous ones given that very little research explores employment stability over 5-years and those studies examining stability measure different aspects or take very different methodological approaches. One study of stability, measured as having the same job over a two-year period, found no associations with child outcomes (Johnson et al 2012); whereas another study found that high quality, stable employment in early childhood (a latent construct) was associated with improved behavior and cognitive outcomes among a low-income sample (Lombardi & Coley, 2013). Prior research on job transitions has found that transitions are linked with poorer child outcomes and in particular poorer child behavior (Hill et al, 2011; Johnson et al, 2012). We similarly find that the number of job transitions was associated with poorer externalizing behavior, but unlike earlier work, we find little evidence of an association with internalizing behavior or cognitive outcomes. This may be because we examine transitions over a longer period and focus on early childhood. Johnson and co-authors (2012) distinguish job mobility (a change that led to a better job) and job loss, finding that job loss was linked with poorer outcomes whereas job mobility was linked with better. Future work that can explore the differences in job mobility and loss, and stability over a longer time period would be a useful next step.

As is the nature of observational studies, our findings may be affected by selection. Mothers who opt into employment are likely to be very different than mothers who do not work, in that they have higher levels of human capital or different genetic endowments. Although we ran a number of robustness checks to address issues of selection, we cannot rule out the possibility that mothers whose children have greater cognitive or behavioral problems may be those who cannot work, or are those who work less stably. Our study also included an extensive set of covariates, including many covariates not typically available in observational data (like cognitive score, impulsive behavior,

depression). While these covariates are an improvement over just income, education or family structure covariates, these measures do not represent all aspects of abilities that may differentiate mothers who are and are not working (genetic variations or gene/environment interactions). If some mothers have genetic endowments that make them less likely to work and those same genetic factors are linked with poorer outcomes for children, our estimates may be biased. The analysis that included additional time varying covariates was also limited because these variables were measured at the same time as employment and were therefore endogenous. Future work that can better tease out the time ordering of these measures and evaluate employment stability would be a useful next step.

Our study has some other limitations. First, our measures of maternal employment stability rely on retrospective self-reports of employment, although research suggests they are generally reliable (Mathiowetz & Duncan, 1988). We were also not able to distinguish an involuntary job loss from a job change, nor stability in work hours or work shifts. Additionally, we did not explore how other aspects of maternal employment, such as intensity or quality, affect child wellbeing. Future research that can examine these other forms of stability and other characteristics of maternal employment would be a useful next step. Second, although our sample extends beyond prior research that focused on limited geographical areas and mothers on welfare, our sample is not generalizable to all low-income mothers.

Despite these limitations, we extend earlier literature by studying the links between maternal employment stability over all of early childhood and child outcomes at ages 5. The findings suggest that more maternal employment in early childhood is linked with lower levels of externalizing behavior problems and higher cognitive scores for children at the start of school, but that employment stability per se is not particularly important. At a time when many public policies emphasize the importance of work, and in particular maternal work, the findings here suggest that in general maternal employment is beneficial for urban children in low-income families.

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Table 1: Employment Stability and Sample Characteristics

	% or M	(SD)
Measures of Employment Stability		
Number of Months of Employment (range 0-73.8 months)		
Mean	36.3	(22.6)
0 months (ref)	12	
1-12 months	8	
12-23 months	10	
24-35 months	18	
36-47 months	12	
48-59 months	20	
60+ months	20	
# of Jobs (range 0-10)	2.5	(1.7)
Demographic and Background Characteristics		
Mother's Race/Ethnicity		
Non-Hispanic Black	52	
Non-Hispanic White	20	
Hispanic	25	
Other (ref)	3	
Mother's Education		
< High school	39	
High school	27	
Some college	25	
College + (ref)	10	
Mother's age	24.9	(6.0)
Mother is an immigrant	12	
# of children in household	1.3	(1.4)
Coresident grandparent	29	
Income-to-needs ratio	2.2	(2.4)
Mother worked before birth	79	
Relationship Status at birth		
Married	21	
Cohabiting	37	
Single (ref)	42	
Survey conducted in Spanish	7	
Maternal grandmother's education		
< High school (ref)	20	
High school	56	
Some college	13	
College +	11	
Maternal grandparent's education differed	15	
Child Characteristics		
Boy child	52	

Table 1: Employment Stability and Sample Characteristics Cont.

	% or M	(SD)
Birth Order		
First	39	
Second	32	
Higher order (ref)	29	
Low birth weight	10	
Child's age wave 5	4.7	(.5)
Child disabled	3	
Baby temperament	2.8	(1.0)
Additional Maternal Characteristics		
Substance use	3	
Cognitive score	6.8	(2.6)
Impulsivity	2.1	(.6)
Additional Longitudinal Covariates		
Relationship Status		
Stably married	23	
Stably cohabiting	9	
Stably single	14	
Unstable married	16	
Unstable cohabiting (ref)	38	
New child born	80	
Health limits work	18	
Material hardship	1.0	(1.1)
# of survey waves in poverty		
0 (ref)	36	
1	17	
2	16	
3	17	
4	16	
# of survey waves depressed		
0 (ref)	72	
1	19	
2	7	
3	3	
Parenting stress	5.3	(1.4)
Parenting activities	5	(1.2)
# survey waves spank child		
0 (ref)	30	
1	26	
2	29	
3	15	
Any center-based care	78	
N	2,011	

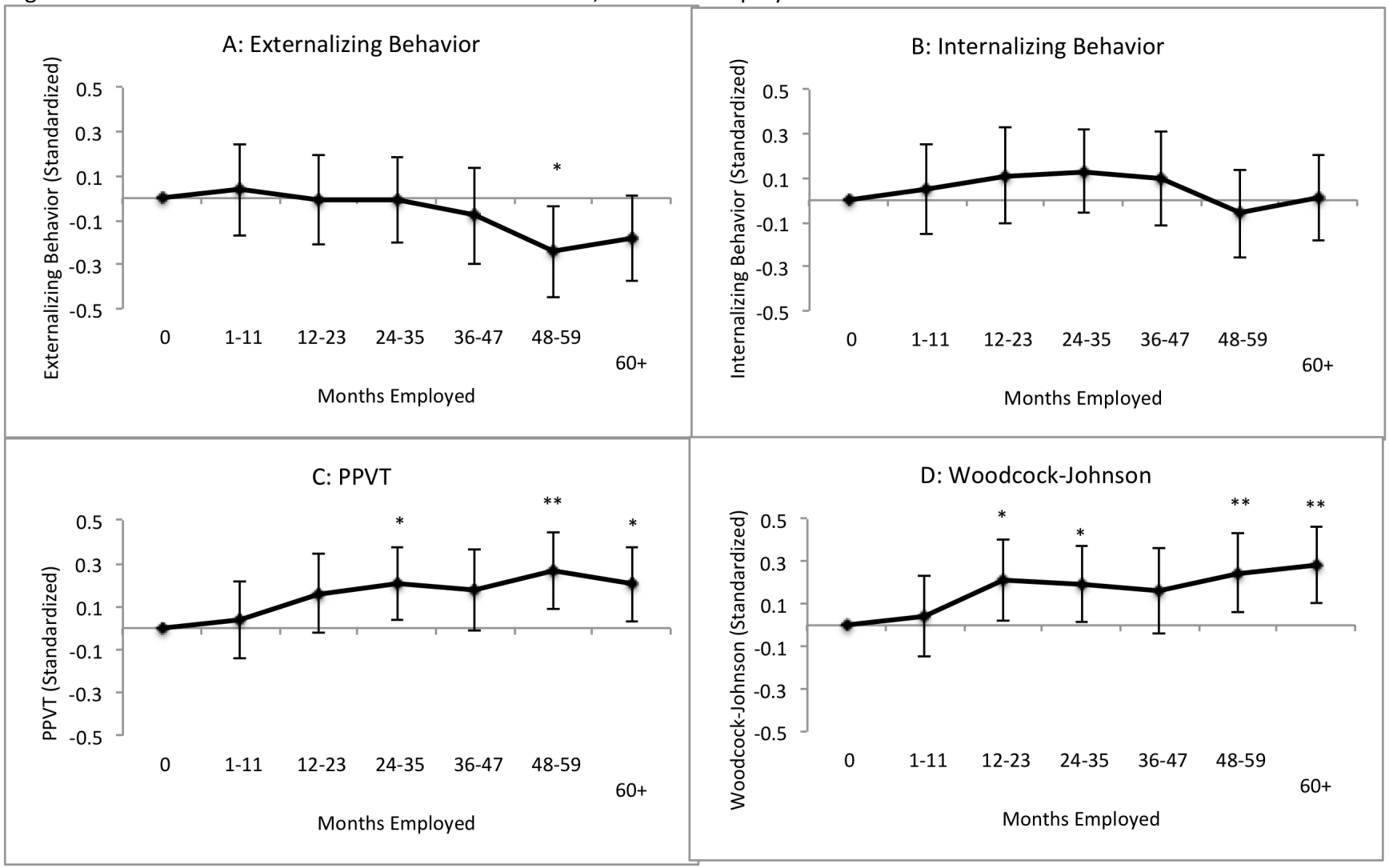
Note: Standard deviations in parentheses. Ref indicates the reference group for the regression analyses.

Table 2: Ordinary Least Squares - Regressing Child Outcomes at Age 5 on Months of Maternal Employment and Number of Jobs (Birth to Age 5)

	Externalizing Behavior									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Months (linear)	-0.004***	-0.004**	-0.003**	-0.003**	-0.003*	-0.007***	-0.005***	-0.005***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs						0.075***	0.038*	0.036*	0.035*	0.039*
						(0.015)	(0.016)	(0.016)	(0.015)	(0.016)
	Internalizing Behavior									
Months (linear)	-0.005***	-0.002*	-0.002	-0.002	-0.001	-0.005***	-0.002	-0.002	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs						0.010	-0.003	-0.005	-0.003	0.002
						(0.015)	(0.016)	(0.016)	(0.015)	(0.016)
	PPVT									
Months (linear)	0.009***	0.005***	0.004***	0.004***	0.004***	0.009***	0.004***	0.003**	0.004**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs						-0.017	0.024	0.022	0.016	0.018
						(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
	Woodcock-Johnson									
Months (linear)	0.008***	0.004***	0.004***	0.003***	0.003***	0.009***	0.004***	0.004**	0.004**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs						-0.033*	-0.003	-0.005	-0.008	-0.003
						(0.014)	(0.015)	(0.015)	(0.015)	(0.015)
Demographic/background characteristics		X	X	X	X		X	X	X	X
Child characteristics			X	X	X			X	X	X
Additional mother characteristics				X	X				X	X
City fixed-effects					X					X
N	2,011									

Note: Standard errors in parentheses. All outcome measures are standardized (M=0, SD=1). Model 1: no control variables. Model 2: demographic/background characteristics: race/ethnicity, education, age, relationship status, immigrant status, whether the mother was interviewed in Spanish, birth order of the focal child, number of children in the household, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, maternal grandmother's education, and an indicator for maternal grandfather's education differing from the maternal grandmother. Model 3 adds child characteristics: child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview. Model 4 adds additional mother characteristics: mother's cognitive (WAIS) score, impulsive behavior score, and whether substance abuse ever interfered with life. Model 5 adds city fixed-effects. Chow tests show statistically significant differences (p<0.01) in coefficient sizes when comparing months in model 5 (without versus with a control for number of jobs) for externalizing behavior.
*** p<0.001, ** p<0.01, * p<0.05

Figure 1: Beta Coefficients and 95% Confidence Intervals, Maternal Employment in Years



Note: Standardized beta coefficient (standardized M=0, SD=1) and 95% confidence intervals for each level of maternal employment from regression models that include a control for the number of jobs and the full set of covariates: race/ethnicity, education, age, relationship status at birth, immigrant status, whether the mother was interviewed in Spanish, birth order of the focal child, number of children in the household, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, maternal grandmother's education, an indicator for maternal grandfather's education differing from the maternal grandmother, child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview, mother's cognitive (WAIS) score, impulsive behavior score, whether substance abuse ever interfered with life and city fixed-effects.
*** p<0.001, ** p<0.01, * p<0.05 indicate statistically significant associations as compared to 0 months of employment.

Table 3: Months of Maternal Employment and Number of Job Birth to Age 5, Robustness to Including Additional Covariates

Covariate:		+ Relation-ship Status	+ New Child Born	+ Health Limits Work	+ Avg. Hardship	+ Waves of Poverty	+ Waves of Depression	+ Avg. Parenting Stress	+ Avg. Parenting Activities	+ Waves of Spanking	+ Any Center Based Care	All together
						Externalizing						
Months (linear)	-0.004***	-0.004***	-0.004***	-0.004**	-0.003**	-0.004***	-0.004**	-0.003**	-0.004***	-0.004***	-0.004***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs	0.039*	0.037*	0.038*	0.039*	0.024	0.040*	0.035*	0.035*	0.038*	0.032*	0.038*	0.017
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)
N						2011						
						Internalizing						
Months (linear)	-0.001	-0.002	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001	-0.002	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs	0.002	0.001	0.001	0.001	-0.013	0.002	-0.003	-0.002	0.002	-0.001	0.002	-0.016
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
N						2011						
						PPVT						
Months (linear)	0.003**	0.003**	0.003**	0.003**	0.003*	0.001	0.003**	0.003*	0.003**	0.003**	0.003**	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs	0.018	0.021	0.019	0.018	0.022	0.028	0.018	0.019	0.018	0.017	0.016	0.025
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
N						2011						
						Woodcock-Johnson						
Months (linear)	0.003**	0.004**	0.003**	0.004**	0.003**	0.002*	0.003**	0.004**	0.004**	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs	-0.003	0.001	-0.002	-0.003	-0.000	0.005	-0.002	-0.003	-0.003	-0.003	-0.006	0.005
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
N						2,011						

Note: Standard errors in parentheses. All outcome measures are standardized (M=0, SD=1). All regressions include controls for: demographic/background characteristics: race/ethnicity, education, age, relationship status at birth, immigrant status, whether the mother was interviewed in Spanish, birth order of the focal child, number of children in the household, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, maternal grandmother's education, an indicator for maternal grandfather's education differing from the maternal grandmother, child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview, mother's cognitive (WAIS) score, impulsive behavior score, whether substance abuse ever interfered with life and city fixed-effects.
*** p<0.001, ** p<0.01, * p<0.05

Table 4: Lagged Dependent Variable and Individual Fixed-Effects Models

	Externalizing Behavior		Internalizing Behavior		PPVT		Woodcock-Johnson	
Lagged Dependent Variable Models - Employment Stability Ages 3 to 5 on Outcomes at Age 5 Controlling for Age 3 Outcome								
No Lag								
Months Employed Age 3 to 5 (range 0-40)	-0.003	-0.004	0.000	0.001	0.007***	0.007**	0.007***	0.008***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
# of Jobs Ages 3 to 5		0.014		-0.012		0.019		-0.013
		(0.031)		(0.031)		(0.027)		(0.029)
Plus Lagged Dependent Variable								
Months Employed Age 3 to 5 (range 0-40)	-0.001	-0.001	0.001	0.002	0.006**	0.005*	0.007***	0.007**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
# of Jobs Ages 3 to 5		0.002		-0.006		0.019		-0.012
		(0.028)		(0.029)		(0.025)		(0.028)
Age 3 Externalizing	0.498***	0.498***						
	-0.022	(0.022)						
Age 3 Internalizing			0.390***	0.390***				
			(0.025)	(0.025)				
Age 3 PPVT					0.364***	0.364***	0.188***	0.188***
					(0.023)	(0.023)	(0.026)	(0.026)
N				2,011				
Individual Fixed-Effects Models - A Change in Months Employed between Ages 1-3 and Ages 3-5 on Changes in Behavior and Cognitive Outcomes between Ages 3-5.								
Months	0.001	0.002	0.003	0.003	0.004*	0.004	0.006*	0.005
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
# of Jobs		-0.01		0.003		0.014		0.029
		(0.023)		(0.026)		(0.024)		(0.030)
Observations				4,022				
Number of individuals				2,011				

Note: Standard errors in parentheses. All outcome measures are standardized (M=0, SD=1). The Woodcock-Johnson model uses PPVT at age 3. Lagged dependent regressions include controls for: demographic/background characteristics: race/ethnicity, education, age, relationship status at birth, immigrant status, whether the mother was interviewed in Spanish, birth order of the focal child, number of children in the household, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, maternal grandmother's education, an indicator for maternal grandfather's education differing from the maternal grandmother, child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview, mother's cognitive (WAIS) score, impulsive behavior score, whether substance abuse ever interfered with life and city fixed-effects.

*** p<0.001, ** p<0.01, * p<0.05

Table 5: Longer Term Outcomes - Employment in Early Childhood (Birth to Age 5) and Outcomes at Age 9

	Externalizing Behavior		Internalizing Behavior		PPVT		Woodcock-Johnson Passage Comprehension		Woodcock-Johnson Applied Problems	
Months (linear)	-0.003*	-0.004**	-0.003	-0.004*	0.002	0.001	0.002*	0.002	0.004**	0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs		0.031		0.033		0.033*		0.019		-0.007
		(0.019)		(0.018)		(0.014)		(0.016)		(0.016)
Months (non-linear)										
1-11 months	0.098	0.066	0.037	0.003	0.031	-0.004	0.046	0.036	-0.070	-0.050
	(0.120)	(0.122)	(0.117)	(0.119)	(0.092)	(0.093)	(0.102)	(0.103)	(0.100)	(0.102)
12-23 months	0.120	0.066	0.019	-0.039	0.074	0.016	0.086	0.070	0.060	0.093
	(0.113)	(0.118)	(0.110)	(0.117)	(0.085)	(0.090)	(0.093)	(0.098)	(0.097)	(0.104)
24-35 months	0.045	-0.023	0.069	-0.004	0.121	0.048	0.158	0.138	0.132	0.174
	(0.101)	(0.110)	(0.103)	(0.112)	(0.075)	(0.083)	(0.084)	(0.092)	(0.085)	(0.095)
36-47 months	-0.062	-0.146	-0.077	-0.166	0.131	0.042	0.173	0.148	0.153	0.204
	(0.107)	(0.123)	(0.111)	(0.126)	(0.082)	(0.094)	(0.091)	(0.104)	(0.097)	(0.111)
48-59 months	-0.124	-0.209	-0.080	-0.171	0.156*	0.065	0.255**	0.229*	0.240**	0.292**
	(0.098)	(0.116)	(0.103)	(0.120)	(0.076)	(0.089)	(0.084)	(0.097)	(0.086)	(0.101)
60+ months	-0.101	-0.171	-0.132	-0.206	0.080	0.006	0.119	0.098	0.175*	0.217*
	(0.105)	(0.116)	(0.105)	(0.116)	(0.077)	(0.085)	(0.084)	(0.094)	(0.087)	(0.098)
# of Jobs		0.028		0.030		0.030		0.008		-0.017
		(0.020)		(0.019)		(0.015)		(0.017)		(0.017)
N	2011									

Note: Standard errors in parentheses. All outcome measures are standardized (M=0, SD=1). All regressions include controls for: demographic/background characteristics: race/ethnicity, education, age, relationship status at birth, immigrant status, whether the mother was interviewed in Spanish, birth order of the focal child, number of children in the household, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, maternal grandmother's education, an indicator for maternal grandfather's education differing from the maternal grandmother, child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview, mother's cognitive (WAIS) score, impulsive behavior score, whether substance abuse ever interfered with life and city fixed-effects. Comparison group is no months of employment for the non-linear specification.

*** p<0.001, ** p<0.01, * p<0.05

Appendix Table 1: Alternative Specifications of Maternal Employment Stability and Developmental Timing Analyses

	Externalizing Behavior	Internalizing Behavior	PPVT	Woodcock-Johnson
Months (linear)	-0.005***	-0.003*	0.002*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
# of Jobs (non-linear)				
1	0.089	0.095	0.098	0.116
	(0.093)	(0.091)	(0.081)	(0.085)
2	0.213*	0.185	0.098	0.057
	(0.097)	(0.096)	(0.086)	(0.090)
3	0.223*	0.094	0.115	-0.008
	(0.104)	(0.103)	(0.092)	(0.096)
4	0.249*	0.188	0.177	0.024
	(0.114)	(0.112)	(0.100)	(0.104)
5+	0.301**	0.133	0.167	0.049
	(0.116)	(0.115)	(0.103)	(0.107)
Length of longest job	-0.004**	-0.002	0.003*	0.004**
	(0.002)	(0.001)	(0.001)	(0.001)
Employment Age 1 to Age 3				
Months (linear)	-0.007**	-0.003	0.006*	0.004
	(0.003)	(0.002)	(0.002)	(0.002)
# of Jobs	0.026	-0.023	0.017	-0.004
	(0.029)	(0.029)	(0.025)	(0.027)
Employment Age 3 to Age 5				
Months (linear)	-0.004	0.001	0.007**	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
# of Jobs	0.014	-0.012	0.019	-0.013
	(0.031)	(0.031)	(0.027)	(0.029)
N		2011		

Note: Standard errors in parentheses. All outcome measures are standardized (M=0, SD=1). All regressions include controls for: demographic/background characteristics: race/ethnicity, education, age, relationship status at birth, immigrant status, whether the mother was interviewed in Spanish, birth order of the focal child, number of children in the household, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, maternal grandmother's education, an indicator for maternal grandfather's education differing from the maternal grandmother, child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview, mother's cognitive (WAIS) score, impulsive behavior score, whether substance abuse ever interfered with life and city fixed-effects.

*** p<0.001, ** p<0.01, * p<0.05

Supplemental Tables

Supplemental Table 1 - Correlation Matrix

	Months employed	# of jobs	Black	White	Hispanic	< High school	High school	Some college	Age	Immigrant	# of children in household	Coresident grandparent
Months employed	1.00											
# of jobs	0.47	1.00										
Non-Hispanic Black	0.04	0.15	1.00									
Non-Hispanic White	0.03	-0.05	-0.53	1.00								
Hispanic	-0.08	-0.10	-0.60	-0.29	1.00							
< High school	-0.26	-0.03	0.03	-0.18	0.15	1.00						
High school	0.05	0.06	0.11	-0.07	-0.05	-0.48	1.00					
Some college	0.20	0.05	0.00	0.05	-0.04	-0.46	-0.35	1.00				
Age	0.03	-0.30	-0.14	0.16	-0.01	-0.26	-0.05	0.10	1.00			
Immigrant	-0.11	-0.20	-0.27	-0.15	0.37	0.05	-0.05	-0.06	0.18	1.00		
# of children in household	-0.10	-0.05	0.17	-0.16	-0.03	0.16	-0.01	-0.08	0.09	-0.09	1.00	
Coresident grandparent	-0.01	0.12	0.11	-0.14	0.00	0.07	0.04	0.00	-0.34	-0.08	0.07	1.00
Income-to-needs ratio	0.17	-0.08	-0.25	0.36	-0.09	-0.33	-0.13	0.13	0.34	0.05	-0.28	-0.11
Mother worked before birth	0.37	0.22	0.03	0.09	-0.11	-0.22	0.05	0.15	0.01	-0.13	-0.09	-0.04
Married	0.04	-0.17	-0.27	0.31	-0.02	-0.23	-0.11	0.04	0.41	0.17	-0.07	-0.23
Cohabiting	-0.01	0.00	-0.07	-0.01	0.11	0.08	0.03	0.00	-0.10	0.03	-0.04	-0.19
Spanish survey	-0.15	-0.19	-0.26	-0.13	0.44	0.15	-0.05	-0.09	0.12	0.64	-0.04	-0.09
High school- grandmother	-0.01	0.05	0.18	0.00	-0.21	0.05	0.09	-0.07	-0.08	-0.22	0.07	0.05
Some college - grandmother	0.07	0.09	0.05	0.08	-0.11	-0.15	-0.03	0.18	-0.06	-0.05	-0.07	0.03
College + - grandmother	0.09	0.00	-0.02	0.10	-0.10	-0.12	-0.10	0.07	0.08	-0.01	-0.09	-0.03
Grandparent education differed	0.03	-0.08	-0.11	0.10	0.03	-0.09	-0.01	0.04	0.08	0.08	-0.04	0.01
Child is first born	0.04	0.11	-0.09	0.10	0.02	-0.08	-0.01	0.07	-0.32	0.01	-0.44	0.21
Child is second born	0.05	0.02	-0.02	0.02	0.01	-0.03	0.01	0.02	0.03	0.03	-0.08	-0.08
Boy child	-0.01	0.00	0.00	0.02	-0.02	0.02	0.01	-0.03	-0.03	-0.01	-0.02	0.04
Low birth weight	-0.06	-0.03	0.10	-0.03	-0.07	0.02	-0.01	0.01	0.03	-0.06	-0.03	-0.01
Child's age at year 5	0.06	0.04	0.21	-0.15	-0.08	0.00	0.04	0.01	-0.07	-0.07	0.01	0.08
Baby temperament	-0.03	0.05	0.10	-0.11	-0.01	0.11	0.01	-0.06	-0.10	-0.07	0.05	0.03
Child disabled	-0.08	-0.04	0.01	-0.01	0.00	0.04	-0.01	-0.02	0.01	-0.01	0.02	-0.01
Substance use	-0.06	-0.04	-0.01	0.01	0.00	0.04	-0.05	0.03	0.03	-0.05	-0.03	0.04
Cognitive score	0.14	0.11	-0.05	0.25	-0.19	-0.27	-0.05	0.18	0.08	-0.22	-0.07	-0.02
Impulsive behavior	-0.10	0.02	0.03	-0.05	0.03	0.18	0.00	-0.09	-0.12	-0.01	0.07	0.10

Supplemental Table 1 - Correlation Matrix Cont.

	Income-to-needs ratio	Mother worked before birth	Married	Cohabiting	Spanish survey	High school-grandmother	Some college grand-mother	College + grand-mother	Grandparent's education differed
Income-to-needs ratio	1.00								
Mother worked before birth	0.17	1.00							
Married	0.49	0.00	1.00						
Cohabiting	-0.11	0.00	-0.39	1.00					
Spanish survey	-0.07	-0.19	0.04	0.07	1.00				
High school- grandmother	-0.10	0.03	-0.11	0.01	-0.21	1.00			
Some college - grandmother	0.09	0.08	0.04	-0.04	-0.06	-0.43	1.00		
College + - grandmother	0.19	0.04	0.12	-0.06	-0.06	-0.39	-0.13	1.00	
Grandparent education differed	0.12	-0.02	0.11	-0.03	0.04	-0.05	0.02	0.06	1.00
Child is first born	0.18	0.11	-0.05	-0.07	-0.03	-0.05	0.12	0.04	0.01
Child is second born	0.01	-0.02	0.07	0.02	0.04	0.01	-0.01	0.04	0.01
Boy child	-0.03	0.00	0.01	-0.04	-0.02	0.01	0.01	0.01	-0.01
Low birth weight	-0.03	-0.03	-0.08	0.01	-0.05	0.05	-0.04	-0.03	-0.03
Child's age at year 5	-0.08	-0.03	-0.10	0.01	-0.06	0.06	0.02	-0.05	-0.02
Baby temperament	-0.12	-0.04	-0.10	0.00	-0.03	0.05	-0.04	-0.02	-0.08
Child disabled	-0.04	-0.02	-0.04	-0.01	0.02	-0.01	-0.03	-0.02	-0.07
Substance use	-0.04	-0.02	-0.05	-0.01	-0.03	0.06	0.03	-0.05	0.01
Cognitive score	0.25	0.15	0.20	-0.07	-0.27	0.02	0.13	0.10	0.06
Impulsive behavior	-0.19	-0.11	-0.13	0.01	0.04	0.06	-0.04	-0.08	-0.05

Supplemental Table 1 - Correlation Matrix Cont.

	First born	Second born	Boy child	Low birth weight	Child's age at 5	Baby temperament	Child disabled	Substance use	Cognitive score	Impulsive behavior
Child is first born	1.00									
Child is second born	-0.55	1.00								
Boy child	0.03	0.00	1.00							
Low birth weight	-0.01	-0.05	-0.05	1.00						
Child's age at year 5	-0.02	0.02	0.02	0.01	1.00					
Baby temperament	-0.07	0.05	0.03	0.06	0.00	1.00				
Child disabled	-0.02	-0.04	0.02	0.07	-0.05	0.06	1.00			
Substance use	0.00	-0.03	0.00	0.00	-0.01	0.01	0.03	1.00		
Cognitive score	0.06	-0.01	0.00	-0.06	-0.03	-0.05	-0.05	0.01	1.00	
Impulsive behavior	-0.03	-0.04	0.03	0.03	0.02	0.11	0.07	0.10	-0.14	1.00

Supplemental Table 2: Ordinary Least Squares - Externalizing Behavior at Age 5 on Maternal Employment (Birth to Age 5) - Non-Linear Model

	Externalizing Behavior									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Months (non-linear)										
1-11 months	0.247*	0.109	0.111	0.090	0.079	0.140	0.066	0.073	0.055	0.037
	(0.103)	(0.104)	(0.101)	(0.101)	(0.102)	(0.106)	(0.106)	(0.103)	(0.102)	(0.103)
12-23 months	0.135	0.022	0.064	0.056	0.065	-0.031	-0.053	-0.004	-0.006	-0.005
	(0.099)	(0.100)	(0.097)	(0.096)	(0.097)	(0.106)	(0.106)	(0.103)	(0.102)	(0.102)
24-35 months	0.140	0.061	0.071	0.078	0.080	-0.050	-0.032	-0.011	0.002	-0.007
	(0.086)	(0.089)	(0.087)	(0.087)	(0.087)	(0.098)	(0.099)	(0.097)	(0.096)	(0.097)
36-47 months	0.054	-0.036	0.014	0.018	0.027	-0.188	-0.153	-0.090	-0.078	-0.080
	(0.094)	(0.098)	(0.096)	(0.095)	(0.096)	(0.110)	(0.112)	(0.110)	(0.109)	(0.109)
48-59 months	-0.120	-0.168	-0.145	-0.125	-0.135	-0.354***	-0.286**	-0.250*	-0.221*	-0.244*
	(0.085)	(0.089)	(0.088)	(0.087)	(0.088)	(0.102)	(0.105)	(0.103)	(0.102)	(0.102)
60+ months	-0.130	-0.132	-0.102	-0.101	-0.092	-0.315***	-0.228*	-0.187	-0.179	-0.180
	(0.083)	(0.089)	(0.088)	(0.087)	(0.088)	(0.094)	(0.099)	(0.097)	(0.096)	(0.097)
# of Jobs						0.070***	0.037*	0.033	0.031	0.035*
						(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Demographic/background characteristics		X	X	X	X		X	X	X	X
Child characteristics			X	X	X			X	X	X
Additional mother characteristics				X	X				X	X
City fixed-effects					X					X
N	2,011									

Note: Standard errors in parentheses. Outcomes are standardized (M=0, SD=1). Excluded group is less than 1 year of employment. Model 1: no control variables. Model 2: demographic/background characteristics: race/ethnicity, education, age, immigrant status, number of children in the household, birth order of the focal child, relationship status at birth, whether the mother was interviewed in Spanish, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, and maternal grandmother's education and an indicator for maternal grandfather's education differing from the maternal grandmother. Model 3 adds child characteristics: child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview. Model 4 adds additional mother characteristics: mother's cognitive (WAIS) score, impulsive behavior score, and whether substance abuse ever interfered with life. Model 5 adds city fixed-effects. Wald tests: Externalizing behavior 48 months or greater is statistically different from lower levels of employment

*** p<0.001, ** p<0.01, * p<0.05

Supplemental Table 3: Ordinary Least Squares - Internalizing Behavior at Age 5 on Maternal Employment (Birth to Age 5) - Non-Linear Model

	Internalizing Behavior									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Months (non-linear)										
1-11 months	0.041	0.047	0.045	0.033	0.041	0.038	0.059	0.061	0.048	0.049
	(0.102)	(0.103)	(0.101)	(0.100)	(0.100)	(0.105)	(0.104)	(0.102)	(0.101)	(0.102)
12-23 months	-0.022	0.030	0.072	0.080	0.097	-0.027	0.052	0.101	0.108	0.109
	(0.098)	(0.099)	(0.098)	(0.097)	(0.097)	(0.105)	(0.105)	(0.104)	(0.103)	(0.103)
24-35 months	0.030	0.093	0.105	0.118	0.116	0.024	0.119	0.141	0.152	0.132
	(0.085)	(0.087)	(0.086)	(0.085)	(0.085)	(0.096)	(0.097)	(0.096)	(0.095)	(0.095)
36-47 months	-0.069	0.013	0.041	0.056	0.077	-0.076	0.046	0.086	0.099	0.096
	(0.092)	(0.096)	(0.094)	(0.093)	(0.093)	(0.108)	(0.109)	(0.107)	(0.107)	(0.106)
48-59 months	-0.258**	-0.142	-0.123	-0.093	-0.080	-0.265**	-0.108	-0.078	-0.050	-0.060
	(0.083)	(0.086)	(0.085)	(0.084)	(0.085)	(0.099)	(0.102)	(0.100)	(0.100)	(0.100)
60+ months	-0.231**	-0.080	-0.041	-0.038	-0.006	-0.237*	-0.054	-0.005	-0.003	0.010
	(0.083)	(0.088)	(0.087)	(0.087)	(0.087)	(0.093)	(0.098)	(0.097)	(0.097)	(0.097)
# of Jobs						0.002	-0.011	-0.014	-0.014	-0.007
						(0.016)	(0.017)	(0.017)	(0.017)	(0.017)
Demographic/background characteristics		X	X	X	X		X	X	X	X
Child characteristics			X	X	X			X	X	X
Additional mother characteristics				X	X				X	X
City fixed-effects					X					X
N	2,011									

Note: Standard errors in parentheses. Outcomes are standardized (M=0, SD=1). Excluded group is less than 1 year of employment. Model 1: no control variables. Model 2: demographic/background characteristics: race/ethnicity, education, age, immigrant status, number of children in the household, birth order of the focal child, relationship status at birth, whether the mother was interviewed in Spanish, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, and maternal grandmother's education and an indicator for maternal grandfather's education differing from the maternal grandmother. Model 3 adds child characteristics: child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview. Model 4 adds additional mother characteristics: mother's cognitive (WAIS) score, impulsive behavior score, and whether substance abuse ever interfered with life. Model 5 adds city fixed-effects. Wald tests: Internalizing behavior 48-59 months is significantly different from fewer than 36 months.

*** p<0.001, ** p<0.01, * p<0.05

Supplemental Table 4: Ordinary Least Squares - PPVT on Maternal Employment (Birth to Age 5) - Non-Linear Model

	PPVT									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Months (non-linear)										
1-11 months	-0.026	0.103	0.099	0.093	0.049	0.008	0.088	0.085	0.084	0.039
	(0.098)	(0.092)	(0.090)	(0.090)	(0.089)	(0.101)	(0.093)	(0.092)	(0.092)	(0.091)
12-23 months	0.241*	0.253**	0.219*	0.196*	0.179*	0.295**	0.227*	0.194*	0.180	0.162
	(0.094)	(0.088)	(0.088)	(0.088)	(0.087)	(0.101)	(0.094)	(0.093)	(0.093)	(0.092)
24-35 months	0.304***	0.300***	0.268***	0.254**	0.227**	0.365***	0.268**	0.238**	0.234**	0.206*
	(0.082)	(0.078)	(0.078)	(0.077)	(0.076)	(0.092)	(0.087)	(0.086)	(0.086)	(0.085)
36-47 months	0.351***	0.311***	0.261**	0.241**	0.202*	0.429***	0.271**	0.224*	0.216*	0.175
	(0.088)	(0.085)	(0.085)	(0.084)	(0.084)	(0.104)	(0.098)	(0.097)	(0.096)	(0.095)
48-59 months	0.486***	0.372***	0.342***	0.317***	0.296***	0.561***	0.331***	0.304**	0.292**	0.269**
	(0.080)	(0.078)	(0.077)	(0.077)	(0.076)	(0.096)	(0.092)	(0.091)	(0.090)	(0.090)
60+ months	0.569***	0.333***	0.288***	0.284***	0.227**	0.629***	0.300***	0.257**	0.264**	0.205*
	(0.080)	(0.079)	(0.079)	(0.078)	(0.078)	(0.090)	(0.088)	(0.088)	(0.087)	(0.087)
# of Jobs						-0.023	0.013	0.012	0.008	0.009
						(0.016)	(0.015)	(0.015)	(0.015)	(0.015)
Demographic/background characteristics		X	X	X	X		X	X	X	X
Child characteristics			X	X	X			X	X	X
Additional mother characteristics				X	X				X	X
City fixed-effects					X					X
N	2,011									

Note: Standard errors in parentheses. Outcomes are standardized (M=0, SD=1). Excluded group is less than 1 year of employment. Model 1: no control variables. Model 2: demographic/background characteristics: race/ethnicity, education, age, immigrant status, number of children in the household, birth order of the focal child, relationship status at birth, whether the mother was interviewed in Spanish, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, and maternal grandmother's education and an indicator for maternal grandfather's education differing from the maternal grandmother. Model 3 adds child characteristics: child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview. Model 4 adds additional mother characteristics: mother's cognitive (WAIS) score, impulsive behavior score, and whether substance abuse ever interfered with life. Model 5 adds city fixed-effects. Wald tests show no significant differences.

*** p<0.001, ** p<0.01, * p<0.05

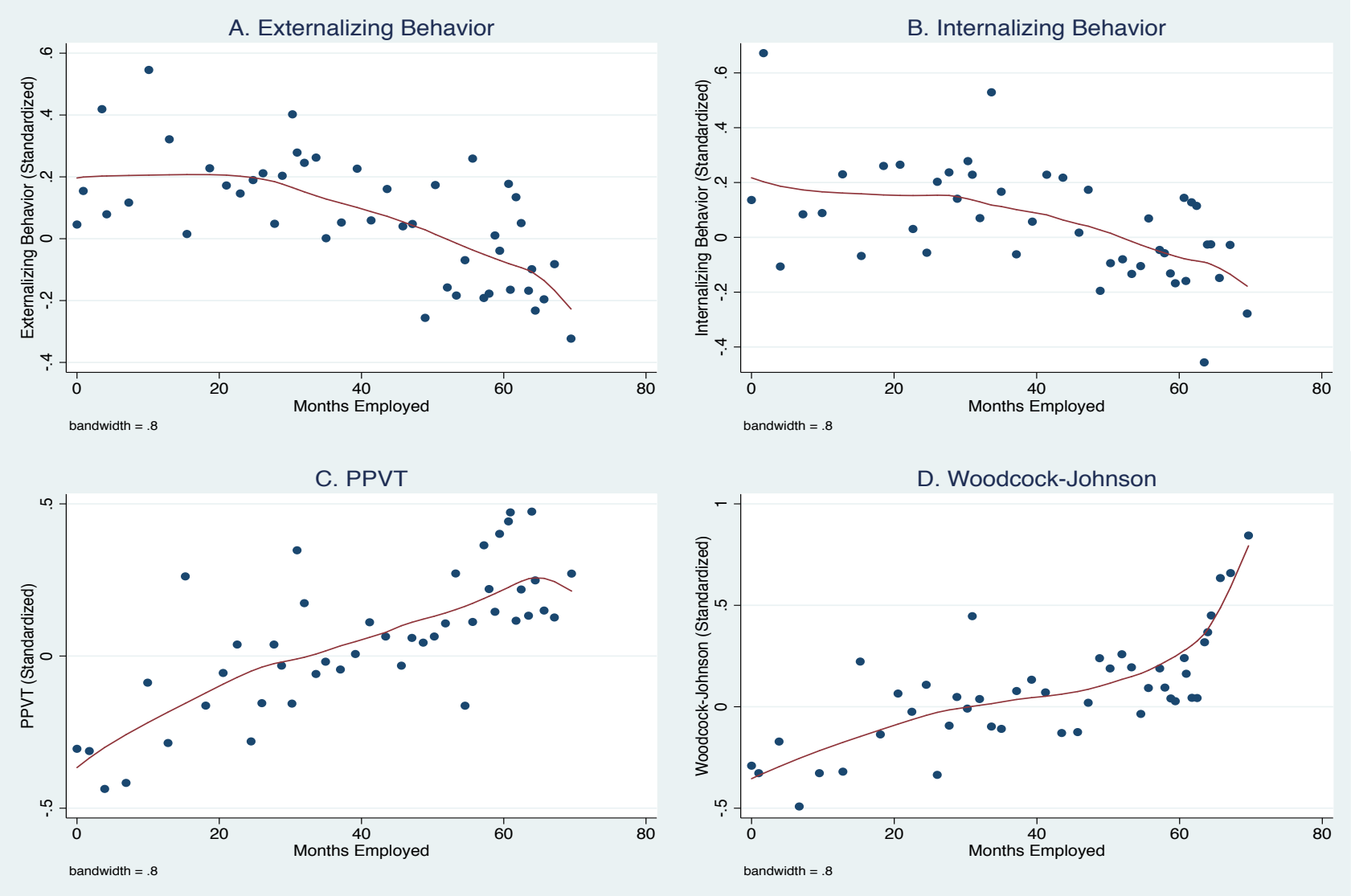
Supplemental Table 5: Ordinary Least Squares - Woodcock-Johnson at Age 5 on Maternal Employment (Birth to Age 5) - Non-Linear Model

	Woodcock-Johnson									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Months (non-linear)										
1-11 months	-0.082	-0.008	-0.007	-0.009	0.035	-0.020	0.005	0.007	0.007	0.044
	(0.099)	(0.096)	(0.094)	(0.094)	(0.093)	(0.102)	(0.098)	(0.096)	(0.096)	(0.095)
12-23 months	0.221*	0.224*	0.195*	0.184*	0.200*	0.316**	0.246*	0.218*	0.211*	0.214*
	(0.094)	(0.092)	(0.091)	(0.091)	(0.090)	(0.101)	(0.098)	(0.097)	(0.097)	(0.096)
24-35 months	0.283***	0.211**	0.177*	0.171*	0.175*	0.392***	0.238**	0.205*	0.205*	0.194*
	(0.082)	(0.081)	(0.080)	(0.080)	(0.079)	(0.092)	(0.091)	(0.090)	(0.089)	(0.089)
36-47 months	0.300***	0.197*	0.142	0.132	0.139	0.439***	0.231*	0.177	0.175	0.161
	(0.089)	(0.089)	(0.088)	(0.088)	(0.088)	(0.105)	(0.103)	(0.101)	(0.101)	(0.100)
48-59 months	0.423***	0.258**	0.235**	0.223**	0.225**	0.557***	0.293**	0.271**	0.266**	0.247**
	(0.080)	(0.081)	(0.080)	(0.080)	(0.080)	(0.096)	(0.096)	(0.095)	(0.095)	(0.094)
60+ months	0.524***	0.296***	0.252**	0.247**	0.266**	0.631***	0.324***	0.281**	0.282**	0.285**
	(0.080)	(0.082)	(0.081)	(0.081)	(0.081)	(0.090)	(0.092)	(0.091)	(0.091)	(0.090)
# of Jobs						-0.040*	-0.011	-0.011	-0.014	-0.007
						(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Demographic/background characteristics		X	X	X	X		X	X	X	X
Child characteristics			X	X	X			X	X	X
Additional mother characteristics				X	X				X	X
City fixed-effects					X					X
N	2,011									

Note: Standard errors in parentheses. Outcomes are standardized (M=0, SD=1). Excluded group is less than 1 year of employment. Model 1: no control variables. Model 2: demographic/background characteristics: race/ethnicity, education, age, immigrant status, number of children in the household, birth order of the focal child, relationship status at birth, whether the mother was interviewed in Spanish, grandparent coresidence, income-to-needs ratio, whether the mother worked the year before the birth, and maternal grandmother's education and an indicator for maternal grandfather's education differing from the maternal grandmother. Model 3 adds child characteristics: child is a boy, whether the child was low birth weight, whether the child has a disability, child's temperament at year 1, child's age at the year 5 interview. Model 4 adds additional mother characteristics: mother's cognitive (WAIS) score, impulsive behavior score, and whether substance abuse ever interfered with life. Model 5 adds city fixed-effects. Wald tests show no significant differences.

*** p<0.001, ** p<0.01, * p<0.05

Supplemental Figure 1. Binned Scatterplot of Months Employed and Standardized Child Behavior and Cognitive Skills.



Note: The figure shows a binned scatterplot (50 bins) and lowess/loess regression line on raw data. Plotted points show means for bins of data from 2,011 mothers.