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Mothers’ labor market choices and child development outcomes in Chile

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**A R T I C L E   I N F O**

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- Chile

**A B S T R A C T**

This paper examines associations between labor market participation of Chilean mothers and the cognitive, language, and socio-economic development of their children. Using a nationally-representative sample of 3-year-old children, we test if mothers’ work intensity in the two previous years is associated with child development outcomes; data were collected in 2010 when children were one year old, and again in 2012, when they were three years old. We find that children who were three years old with mothers who worked for higher fractions of their children’s lives in the previous two years perform significantly better on all tests (cognitive, language, socio-emotional) than children whose mothers had worked less, while controlling for baseline test performance. These main effects did not remain significant with the inclusion of a wide range of socio-economic, demographic control variables, however. Our results were similarly null when using an IV analysis or a propensity score matching approach. We provide descriptive information on theoretical pathways by which maternal work may influence child development. Though several of these pathways (e.g. preschool, toys, maternal stress) seem to be associated with both maternal work and child development outcomes, the pathways are not sufficiently strong to generate an association between maternal work and child development. We conclude that Chilean mothers’ employment in early childhood generally does not have an effect on child development.

1. Introduction

Mothers’ labor force participation choices may influence their children positively or negatively. There is a large body of literature, much from US context, which provides mixed evidence on the strength and direction of associations between mothers’ work outside the home and child development. For example, in a review of 16 papers evaluating outcomes of children from birth to age 15 years to assess the associations of maternal employment and child cognitive outcomes measured with the US NLSY (National Longitudinal Survey of Youth), roughly a third of the papers find insignificant associations, a third find negative associations, and a third find associations that vary according to the group studied or the timing of inputs (Keane & Bernal 2005). Although the majority of the papers in the NLSY literature review use OLS, many of the papers use more causally plausible identification strategies to explore heterogeneous impacts of mothers’ work by child age. For example, Blau and Grossberg (1992) take an instrumental variable (IV) approach and find maternal employment has a negative effect in the first year of children’s lives and a potentially positive and offsetting impact in the second year; the net impact in the first overall three to four years is insignificant, however. In contrast, Hill, Waldfogel, Brooks-Gunn, and Han (2005) use propensity score matching and find small but significantly negative effects of maternal employment on children’s cognitive outcomes (measured among children ages three to eight years old) from full-time employment in the first year post-birth as compared with employment postponed until after the first year. James-Burdumy (2005)’s individual and family fixed-effects results show that only a math test was negatively affected by maternal hours and weeks worked in the first year of the child’s life. Taking a structural approach, Bernal (2008) has perhaps best modeled the simultaneity of both the working and child care decisions and finds having mothers working full-time and using child care for an additional year during the first five years of life is associated with a reduction in math, vocabulary, and reading test scores at child ages three to six years.

The lack of a consistent association between mothers’ employment and child outcomes suggests that distinct pathways may have competing influences on the direction of the association.

First, more time in the labor force can result in less time available for supporting child development activities: mothers and other adults can provide important cognitive stimulation to their children, which is linked to improved developmental outcomes in the short term
(Grantham-McGregor, Powell, Walker, & Himes, 1991) and the long term (Gertler et al., 2014; Walker, Chang, Vera-Hernández, & Grantham-McGregor, 2011). There is evidence that working outside the home is linked with less time at home to provide cognitive stimulation, but the magnitude of the effect is small. For example, in one study, US-based mothers with jobs outside the home are found to have spent only 12 min less per day playing with their children, and 37 min less caring directly for their children than mothers not working outside the home (Cawley & Liu, 2012). It is likely that even if mothers reduce time spent with the children, other family members or caregivers may step in. For example, when mothers’ employment rose between 1965 and 1998, US fathers who were married increased the time spent with children from 2.8 to 3.8 h per day (Bianchi, 2000). Grandparents may also help with child care when mothers become employed, especially in families with lower earnings potential (Gray 2005).

A second key pathway through which labor force participation could be connected to child outcomes is that more time in the labor force results in greater income, which could then allow parents to provide additional goods and services (e.g. food, medicine, toys and books, enrollment in early childhood education) that support child development (Yeung, Linver, & Brooks-Gunn, 2002). Son and Morrison find that among children 36–54 months, an improvement in home environment, including stimulating toys, is associated with language improvements (2010). In Chile, Cortázár (2015) finds that children who have attended an early childhood education program score higher on math, reading, and social science tests in the fourth grade. In two other South American nations similar to Chile, child development and achievement outcomes (test scores and behavior in Argentina, and enrollment and grade progression in Uruguay) are improved among children who participate in expanded public pre-primary programs compared to children who do not (Berlinski, Galiani, & Gertler, 2009; Berlinski, Galiani, & Manacorda, 2008).

A third pathway through which maternal work force participation can affect child outcomes is via stress because stress generated from working outside the home can influence mothers’ interactions with children at home. In one study among mothers of 6-month-old infants, increased maternal work hours are associated with increased depressive symptoms and parenting stress (Chatterji, Markowitz, & Brooks-Gunn, 2012). In contrast, working outside the household can allow for mothers’ improved social contacts and self-esteem, which may lower stress and improve interactions with children (Miyake, Tanaka, Sasaki, & Hirota, 2011). For example, among single, African-American mothers, being employed does not reduce the financial strain experienced by single mothers, but not being employed is associated with higher levels of parenting stress (Gyamfi, Brooks-Gunn, & Jackson 2001). Among children enrolled in Head Start, an increase in mothers’ work hours is predictive of decreases in mothers’ depressive symptoms, and an increase in mothers’ income during that period is predictive of less angry and coercive parenting by mothers (Raver, 2003).

The current paper adds to the literature on mothers’ labor force participation and child outcomes by using a rich panel data set from Chile that includes a broad set of early childhood outcomes (general, participation of parenting stress (Gyamfi et al., 2011). Among children born between 2006 and 2012, the Encuesta Longitudinal de Primera Infancia (ELPI, Longitudinal Survey of Early Life) (Centro Microdatos, 2012). The first round of ELPI was conducted in 2010 and the second in 2012, with a supplementary sample added for children born between the two rounds; children were between ages six months and seven years in 2012. The attrition rate between the two rounds was 15%. The ELPI was supported by the Chilean Ministries of Education and Labor, and the Institutional Review Board at the University of Pennsylvania approved this research.

2. Methods

2.1. Data source

We use data from a nationally-representative survey of Chilean children born between 2006 and 2012, the Encuesta Longitudinal de Primera Infancia (ELPI, Longitudinal Survey of Early Life) (Centro Microdatos, 2012). The first round of ELPI was conducted in 2010 and the second in 2012, with a supplementary sample added for children born between the two rounds; children were between ages six months and seven years in 2012. The attrition rate between the two rounds was 15%. The ELPI was supported by the Chilean Ministries of Education and Labor, and the Institutional Review Board at the University of Pennsylvania approved this research.

2.2. Variables

2.2.1. Primary dependent variable: child development outcomes

To assess child development, we use the results of three child development tests that have been internationally validated as outcomes. The first measure of child development is the Spanish-language version of the Battelle Developmental Inventory screening test (Newborg, Stock, & Wnek, 1996). Children are assessed on their progress in performing a sequence of developmental milestones. The Battelle is internationally used, is a standard in the field, and has been used to validate other child development test in Mexico (Rizzoli-Córdoba et al., 2013). The screening version was developed by selecting items most correlated with the total score and does not allow for reporting by subscale of different arenas of child development (Centro Microdatos, 2013). For the 2010 survey, the full version of the Battelle was used while the 2012 survey used the screening version. Our results are robust to using the total score or the subscale scores from 2010; for simplicity, we present results using the total score.

The second measure of child development is receptive vocabulary: the 125 item Test de Vocabulario en Imagenes Peabody (TVIP, Spanish version of the Peabody Picture Vocabulary Test) (Dunn, Padilla, Lugo, & Dunn, 1986), which has been used extensively in Latin America (Crookston et al., 2013; Schady et al., 2015). Since items differ from those in the English version of the test, the TVIP was validated with Mexican and Puerto Rican populations.

The third measure captured socio-emotional development with the Spanish version of the Child Behavioral Checklist (CBCL 1), a validated, reliable, parent-completed checklist consisting of 99 items assessing a range of problem behaviors relating to socio-emotional well-being (Achenbach & Rescorla, 2000). The CBCL has been validated in Argentina and Uruguay, two Latin American countries in the same region as Chile (Corina, 2008); (Viola, Garrido, & Rescorla, 2011). We reversed the scale so that higher values are associated with better development outcomes, as are the scales of the other two assessments that we use.

For each of the three assessments described above, we normalize the test scores by age using two-month age periods and generate normalized variables with a mean of 0 and a standard deviation 1, as has been done before in the literature (Fernald, Weber, Galasso, & Ratsibandrihannana, 2011). For 2012 data, 12 observations of Battelle, 8 observations of the TVIP, and 4 of the CBCL were replaced with 4 or -4 because they had extreme values (beyond four standard deviations). For the 2010 data, 4 observations of the EEDP and 1 observation of the Battelle were similarly replaced.
2.2.2. Independent variable: maternal work intensity

Data on employment come from each mother responding to a questionnaire about her labor history since 2004. Spells of employment and unemployment indicate months and years at the start and end of each period of employment. From the labor history dates and the children’s birthdays, we calculate the number of months the mother worked between the 2010 and the 2012 surveys, when the children were one and three years old. Using this approach, we create the variable “fraction of the time employed between the surveys” which measures mothers’ intensity of participation in the labor force. This variable takes into account different employment spells and hours worked, with full-time being considered 45 h a week, as is the legal definition in Chile (Kanbur, Ronconi, & Wedenoja, 2013). For example, if the mother worked 25 h a week the first year, and 45 h a week the second year, the total calculation for “fraction of time employed between the two surveys” is 0.77. Hours reported that exceed 45 h a week are capped at 45 h for this calculation; thus, for example, a woman reportedly working 55 h a week is classified as working 100% time. Blau and Grossberg’s (1992) US study of children’s cognitive development and maternal employment employs similar variables (proportion of weeks worked in children’s first year and proportion of weeks worked after children’s first year), but they do not adjust for full-time or part-time schedules.

2.2.3. Pathway variables

These variables are primarily from 2012 and reflect variables that could be changing simultaneously with the maternal work decisions.

2.2.3.1. Parental engagement. The Family Care Indicators were asked to both mother and father to determine how many times a week an activity was done with the child (Kriger et al., 2012). We code the responses: 0–never, 2–1–3 times, 5–4–6 times, 7–daily. We add the mothers’ and fathers’ participation together for each activity with the children and then create four categories determined using factor analysis (loadings in Table A3) that we have named as indicated in italics: didactic (teaches alphabet; teaches numbers and counting; teaches colors; teaches animals and their sounds), outings (takes child to town squares, parks, zoos, libraries, or museums; to stores or markets; to visit friends or family, culture-sharing (reads/looks at books; tells stories; sings songs), and household (dine together, converse or draw together, do chores together). The numbers of times the activities were done are added together within each category to create the value of each outcome variable. Initially we examined mother and father activities with the child separately, but we find that when a mother works more, the father participates more (statistically significant) with the child in all categories except culture-sharing (reading, stories, songs). As father engagement can support child cognitive and behavioral development (Dubowitz et al., 2001; Sarkadi, Kristiansson, Oberklaid, & Bremer, 2008), we add mothers’ and fathers’ times together for each category.

2.2.3.2. Preschool intensity. Similar to the labor force history, the ELPI survey includes a retrospective history of the child’s preschool attendance. We calculate the percent of the time between the 2010 and 2012 survey rounds the child spent in preschool, taking into account half- and full-day programs. Though the literature contains some concern for the simultaneity of the preschool attendance and work decisions (Bernal, 2008), we have chosen to model preschool participation as a possible mediator because, on average, children’s mothers have worked a longer portion of the children’s lives than the portion the children have been enrolled in preschool (mean 0.15, s.d. 0.36). Furthermore, the correlation between the two variables is only 0.27. This suggests the work decision and the preschool decision are associated somewhat, but far from completely.

2.2.3.3. Toy index. The toy index was generated using principal components analysis from questions from the HOME scale (Totsika & Sylva, 2004), which asks if different types of toys designed to stimulate child development were present in the home (Table A4).

2.2.3.4. Maternal stress. Maternal stress was assessed using the Parenting Stress Index (Abidin, 1990; Reitman, Currier, & Stickley, 2002); we refer to this outcome as the Maternal Stress Index (MSI) because the test was administered to primary caregivers, over 98% of whom are mothers. There are three sub-scales of the MSI (maternal distress, mother-child dysfunctional interaction, and difficult child); we include the first two separately but do not assess the difficult child measure because child temperament, a key determinant of the difficult child index, is considered to remain consistent over time (Degnan et al., 2011). The maternal distress subscale examines to what extent a mother is experiencing stress in her role as parent and measures the sense of parenting competence. It evaluates stresses associated with restrictions on her life, conflict with the child’s other parent, social support, and depressive symptoms. The mother-child dysfunctional interaction subscale assesses the extent to which the mother sees the child as a disappointment, feels rejected or alienated by/from the child, or has not properly bonded with the child. The difficult child sub-scale tells how easy or difficult the mother perceives her child to be.

For simplicity in interpreting the results, we normalize the MSI over the whole population; higher scores indicate greater stress. Outlying observations with normalized MSI sub-scale scores beyond 4 standard deviations are assigned the value 4 (N = 6).

2.2.4. Instrumental variables

We have identified five variables that are possible instruments for mothers’ labor force participation, variables that are correlated with mothers’ work, but would not otherwise influence child development. An indicator variable denotes if the children’s mothers were employed before the children were born. We also measure the female labor force participation in the community: using the full sample from 2010, we calculate the percentage of mothers in the same community who have children between ages two and four years working full time. This calculation excludes the employment status of the child’s mother. A similar variable measures the percentage of mothers working part time. Our final two variables are similarly constructed community averages (omitting the child’s mother’s value) of an equality index and a traditional values index. We generate these two indices on maternal values using factor analyses (See Table A1 for questions and factor loadings). The equality values index reflects agreement with questions relating to women’s financial independence and shared household work between husband and wives, while the traditional values index summarizes questions that support homemaker roles for women.

2.2.5. Baseline control variables

The primary difference between the baseline controls from 2010 and the pathway variables is their possible exogeneity with the independent variable, the maternal labor force participation between 2010 and 2012. The pathway variables were mainly measured in 2012 and are likely endogenous, while the baseline controls were measured in 2010, unable to be impacted by employment after the initial survey collection.

We use two child development assessments from the 2010 survey round to control for prior development because the literature suggests a value-added framework for child development is appropriate, due to learning built on previous skills (Cunha et al., 2006). The Battelle Inventory and the Psychomotor Evaluation Scale (Escala de Evaluación del Desarrollo Psicomotor, EEDP) were applied to children 6–23 months in 2010. Although the TVIP and CBCL were applied to children older than 30 months in 2010 and could have been considered as control variables, we chose to examine the younger set with Battelle and EEDP scores in 2010 because research indicates younger children are most likely to be vulnerable to parental absence. For example, previous studies suggest that children two years old or younger are more
susceptible to maternal absence (Bernal 2008; Blau & Grossberg, 1992; Hill et al., 2005; James-Burdumy, 2005). We limit ages of children in our study to 36–47 months in 2012; these children were 12–23 months in 2010. A broader age range in 2012 (33–55 months) did include some children with both Battelle and EEDP in 2010 and Battelle, TVIP, and CBCL in 2012, but there are few children of the oldest and youngest ages.

In line with a socio-ecological framework (Bronfenbrenner & Morris, 1998), we include additional covariates at the child, mother, and household level. We have selected covariates that have been shown to be associated with child development outcomes in previous literature. Sex of child is a binary variable (male = 1) (Matthews, Ponitz, & Morrison, 2009) while maternal age at first child’s birth is continuous (Ruedinger & Cox, 2012). Maternal schooling is an indicator variable for completed secondary only or has some tertiary, with primary as the base (Carneiro, Meghir, & Parey, 2013). As measures of maternal intelligence, we normalize mothers’ scores on the verbal and mathematic Wechsler Adult Intelligence Scale (WAIS) test (Apfelbeck & Hermosilla, 2000; Tong, Baghurst, Vimpani, & McMichael, 2007). We control for the number of siblings since mothers’ time allocation with any one child can be limited if there are multiple children (Bernal, 2008). Additionally, equality and traditional values (indices described earlier) can be associated with parenting styles and conflict in the home, which have been shown to be important influences for child development (Bartkowski, Xu, & Levin, 2008; Halgunseth, Ispa, & Rudy, 2006). We also control for household socio-economic status with an index created using factor analyses for household assets to proxy for socio-economic status (Bradley & Corwyn, 2002). Because assets do not change significantly from one day to the next when a woman becomes employed, they can function as a proxy for longer-term wealth (Sahn & Stifel, 2003). Included in the asset index are refrigerator, washing machine, dvd, microwave, video camera, cell phone, computer, internet, cable, and hot water in the home. The presence of a father or a grandparent in the household are also indicator variables (Dunifon, Ziol-Guest, & Kopko, 2014). Finally, we include an indicator variable for urban status and dummies for the 15 Chilean regions. We do not use child age as a covariate because outcome variables are age-normalized.

2.3. Participants

Our sample is the set of children ages 36–37 months in 2012 who had complete control variables. Fig. 1 indicates how each restriction reduces the sample size until we arrived at our analytical sample, 83% of the surveyed three-year-old children. The propensity score robustness check further limits the sample size to children of mothers who worked full time the entire two years or did not work at all.

2.4. Statistical analyses

We estimate the same OLS specification for all of the outcome variables that we consider. We examine the correlation between each outcome and the intensity of the mothers’ work during the previous two years, controlling for previous scores on child development tests.

\[ Y_{it} = \alpha_{0i} + \alpha_{0i} \cdot IMWi + \alpha_{0i} \cdot X_{2010} + \epsilon_{it} \]  

(1)

\( Y_{it} \) is the \( t \)th outcome of child \( i \). IMWi is the intensity of mother working from the 2010 survey interview to the 2012 survey interview. \( X_{2010} \) is a vector of baseline characteristics identified from previous literature applying an ecological framework. Model 1 introduces previous child development scores and geographical fixed effects as components of \( X_{2010} \) while Model 2 adds other baseline child, mother, and family covariates. \( \epsilon_{it} \) is a stochastic disturbance term for the measured \( \text{ath} \) outcome that might reflect, for example, measurement error in the child development tests. We test for non-linearities in maternal labor participation, but coefficients on a squared and cubed term of IMWi are not statistically significant, so we leave these out of the estimates that we present. We use Huber-White standard errors throughout to control for heteroscedasticity.

Models 3 and 4 add \( \alpha_{0i} \cdot X_{2012} \) to Eq. (1). \( X_{2012} \) is the vector of potential pathway variables, but model 3 excludes maternal stress. Model 4 includes maternal stress, but the sample size is smaller due to missing observations. We regress each potential pathway variable individually on mothers’ labor force intensity to investigate their associations.

To adjust for the fact that this sample is not representative—mainly due to casewise deletion for missing covariates—, a logit regression using the control variables is used to generate inverse probability weights of being in the sample; we use these multiplied by the 2012 sample weights (which already take attrition from 2010 into account) in all of our specifications to correct for selection bias. The variable with the most missing values is parental stress, followed by maternal intelligence score. Results are qualitatively the same when omitting the parental stress pathway covariate.

We perform two sensitivity analyses (results not shown). Multiple imputation yields similar results. Likewise, unweighted results are similar, but we present weighted results as they are more appropriate for descriptive statistics at national scale.

Due to the concern that the work intensity variable may be correlated with the error term, we also perform two robustness checks.

First, we implement an instrumental variable analysis using the variables described in Section 2.2.4 to predict mothers’ work intensity in the previous two years as a first-stage analysis. The first-stage regressions confirm the explanatory power of the instruments, although the community variables—those most convincingly exogenous—are the least significant. We test for under-identification using the Kleibergen and Paap Wald F-statistic, with the null hypothesis being that the instruments are weakly identified. In the second stage, incorporating the instrument and all baseline controls, we use Hansen’s J test for over-identification and we apply the Anderson-Rubin chi-squared test of endogenous regressors.

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**Table 1:** Sample restrictions.

| Event Description                                                                 | Sample Size (% of sample) |
|-----------------------------------------------------------------------------------|---------------------------|
| Between the ages of 36-47 months in 2012                                           | N=2985 (100%)             |
| + Complete 2012 & 2010 child development tests                                      | N=2628 (88%)              |
| + Mothers have complete labor history                                              | N=2583 (86.5%)            |
| + Complete data on pathways, except parental stress                                | N=2556 (85.5%)            |
| + Mothers’ age at first birth between 15 & 50 years                                 | N=2529 (84.7%)            |
| + Mother’s intelligence scores available                                            | N=2482 (83.1%)            |
| + Complete data on all additional covariates*                                       | N=2476 (82.9%)            |
| + Full time or no work                                                             | N=1351 (45.3%)            |

*Analytical sample

Propensity score sample on common support

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*Fig. 1. Sample restrictions.*
Second, we implement a propensity score matching analysis, comparing outcomes of children of women who have worked full-time between surveys to children of women who never worked between surveys. This restriction to a dichotomous treatment variable reduces the sample size to \( N = 1351 \). Propensity scores were generated using a logit function. We calculated three propensity scores: one incorporating the baseline control variables including the 2010 child development tests, another adding the contemporaneous pathway variables excluding maternal stress, and the final including maternal stress. Sample weights were not used. We then matched observations on the common support within a 0.01 caliper. Balance was assessed using Rubins’ \( B \) (the absolute standardized difference of the means of the linear index of the propensity score in the treated and matched non-treated group) and Rubin’s \( R \) (the ratio of treated to matched non-treated variances of the propensity score index).

3. Results

3.1. Sample description

Two-thirds (65%) of women with children age three years in 2012 have worked at some point between the 2010 and 2012 surveys (Table 1). Of the women who have worked, the mean portion of the two years worked was 63%. There was substantial movement in and out of the labor force during these two years: only 50% of women who have worked were employed in 2010 and stayed employed until the 2012 survey (Fig. 2).

Participants included in this study differ from the full sample surveyed because they are wealthier, they are more likely to have biological fathers in the household, and their mothers have higher levels of education – generally suggesting higher socio-economic status in the study sample compared with the full sample (Table A2). Means of the standardized maternal math test and the child cognitive and language tests are higher than 0 because they were normalized using the entire survey population.

### Table 1
Summary statistics.

| Variable                                      | Mean   | SD    | Min   | Max   |
|-----------------------------------------------|--------|-------|-------|-------|
| Age Normalized Test Scores                    | Batelle: Composite Score from Screening Test | 0.05   | 0.98  | -4.00 | 2.74  |
|                                              | TVIP: Receptive vocabulary               | 0.06   | 1.00  | -1.74 | 4.00  |
|                                              | CBCL: Behavior                            | 0.01   | 0.98  | -4.00 | 1.94  |
|                                              | Batelle: Total Development Score (2010)   | 0.05   | 0.97  | -3.95 | 3.15  |
|                                              | EEDP: Psychomotor (2010)                  | 0.04   | 0.98  | -4.00 | 3.58  |
| Work intensity                                | Fraction of Last Two Years Worked         | 0.41   | 0.41  | 0     | 1     |
| Confounders                                   | Parental time in didactic activities (weekly) | 25.62  | 15.99 | 0     | 56    |
|                                              | Parental time in outings                   | 15.42  | 9.26  | 0     | 56    |
|                                              | Parental time in culture sharing Activities | 15.11  | 9.90  | 0     | 42    |
|                                              | Parental time in household activities      | 23.04  | 10.99 | 0     | 42    |
|                                              | Fraction of 2010–2012 in preschool        | 0.21   | 0.26  | 0     | 1     |
|                                              | Toy index                                   | 0.02   | 0.98  | -1.44 | 1.44  |
|                                              | Parental stress index: parental distress    | 0.14   | 0.88  | -1.35 | 3.16  |
|                                              | Parental Stress Index: Parent-Child Disfunction\(^a\) | -0.02  | 0.88  | -0.96 | 4.00  |
| Instrumental variables                        | Employed before child born                  | 0.60   | 0.49  | 0.00  | 1.00  |
|                                              | Mothers works full time (community average, 2010) | 0.28   | 0.10  | 0.00  | 1.00  |
|                                              | Mothers works part time (community average, 2010) | 0.15   | 0.06  | 0.00  | 1.00  |
|                                              | Equality factor (community average)        | -0.01  | 0.30  | -1.38 | 1.02  |
|                                              | Traditional factor (community average)     | 0.03   | 0.25  | -1.18 | 2.64  |
| Baseline covariates from the ecological framework | Child age (months)\(^a\)                   | 41.57  | 3.35  | 36    | 47    |
|                                              | Child sex (male = 1)                        | 0.51   |       | 0     | 1     |
|                                              | Number of siblings (2010)                  | 0.84   | 0.97  | 0     | 7     |
|                                              | Mother’s age at oldest child’s birth        | 22.37  | 5.12  | 15    | 44    |
|                                              | Mother’s education is completed secondary   | 0.67   | 0.47  | 0     | 1     |
|                                              | Mother’s education is at least some tertiary | 0.21   | 0.41  | 0     | 1     |
|                                              | Mother’s math ability score                 | 0.08   | 0.98  | -3.67 | 4.35  |
|                                              | Mother’s vocab ability score                | 0.14   | 0.97  | -1.88 | 2.83  |
|                                              | Mother’s equality values factor             | -0.02  | 1.04  | -1.83 | 4.88  |
|                                              | Mother’s traditional values factor          | 0.04   | 1.00  | -2.77 | 3.01  |
|                                              | Wealth index (2010)                         | 0.05   | 1.00  | -2.00 | 1.88  |
|                                              | Biological father lives in household (2010) | 0.70   |       | 0     | 1     |
|                                              | Grandparent lives in household (2010)       | 0.41   |       | 0     | 1     |

\(^a\) Child age is not used as a covariate in the regressions since outcome variables are age normalized.

\( N = 2476 \) except in \(^*\) \( N = 1741 \)

CBCL is the Child Behavior Checklist. TVIP is the Test de Vocabulario en Imagenes Peabody. EEDP is the Escala de Evaluación del Desarrollo Psicomotor

Child development scores normalized over two month age groups

The Equality and Traditional Values Factors are the two principal components of a factor analysis of questions regarding mother’s attitudes toward work and family.

Variables were measured in 2012 unless otherwise noted.

Fig. 2. Distribution of mothers’ work intensity variable.
Children with mothers working for higher fractions of the past two years of children’s lives to date perform better on all tests (general, language, socio-emotional), whereas only cognitive development is associated with maternal time in didactic activities. Male children perform worse than female children on all development tests, and there are positive associations with being from wealthier households or from having educated mothers. Mothers’ math scores are more strongly associated with cognitive development and vocabulary, while vocabulary is more strongly associated with behavior.

Inclusion of variables representing pathways connecting fraction of last two years worked and child development does not further change the associations between child outcomes and mothers’ labor force participation (Models 3 & 4, Table 2). Some of the newly-added variables are significant, however, including parental time in culture-sharing activities, fraction of the past two years in preschool, and the toy index. Having a larger number of toys is associated with better scores on all measures of child development, whereas only cognitive development is associated with

### Table 2
Child development (Normalized Scores) & Mother’s Labor Force Participation.

|                        | Batelle (Composite Score) | TVIP (Vocabulary) | CBCL (Socio-emotional Development) |
|------------------------|---------------------------|-------------------|------------------------------------|
|                        | Model 1 | Model 2 | Model 3 | Model 4 | Model 1 | Model 2 | Model 3 | Model 4 | Model 1 | Model 2 | Model 3 | Model 4 |
| Fraction of last two years worked | 0.226*** | 0.08 | 0.064 | 0.065 | 0.209*** | -0.014 | -0.009 | 0.027 | 0.147*** | -0.033 | -0.003 | -0.04 |
| Battelle               | (0.050) | (0.052) | (0.053) | (0.062) | (0.056) | (0.056) | (0.058) | (0.069) | (0.048) | (0.050) | (0.052) | (0.061) |
| Battelle              | (0.026) | (0.025) | (0.025) | (0.028) | (0.029) | (0.028) | (0.028) | (0.032) | (0.027) | (0.026) | (0.026) | (0.029) |
| EEEP                  | 0.110*** | 0.091*** | 0.092*** | 0.072* | 0.115*** | 0.102*** | 0.099*** | 0.093*** | 0.046 | 0.046 | 0.046 | 0.023 |
| Parental time in didactic activities | 0 | -0.001 | 0.002 | 0.005 | 0 | 0.002 | 0.002 | 0.002 | 0 | 0.002 | 0.002 |
| Parental time in outings | -0.002 | 0.002 | -0.001 | -0.001 | -0.002 | 0.003 | -0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Parental time in culture sharing | 0.007** | 0.007* | 0.004 | 0.005 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Parental time in household activities | 0.001 | 0.002 | 0.004 | 0.004 | 0.002 | 0.004 | 0.004 | 0.004 | 0.001 | 0.001 | 0.001 | 0.001 |
| Fraction of 2010-2012 in preschool | 0.217** | 0.213* | 0.074 | 0.063 | 0.12 | -0.148 |
| Toy index             | 0.164*** | 0.136*** | 0.116*** | 0.099*** | 0.093*** | 0.074** |
| Parental Stress Index: Parental distress | 0.04 | 0 | -0.213*** | (0.032) | (0.032) |
| Parental stress index: parent-child disfunction | -0.168*** | -0.168*** | -0.168*** | -0.168*** | -0.168*** | -0.168*** |
| Child sex (male = 1)   | 0.268*** | -0.256*** | -0.238*** | -0.108*** | -0.098*** | -0.147*** | -0.190*** | -0.181*** | -0.191*** |
| Number of siblings     | -0.027 | -0.012 | -0.013 | -0.092*** | -0.083*** | -0.076*** | 0.086*** | 0.091*** | 0.111*** |
| Mother's Age at oldest child's birth | -0.001 | -0.002 | 0.004 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Mms education is secondary | 0.212*** | 0.179** | 0.111 | 0.224*** | 0.192*** | 0.14 | 0.210*** | 0.187*** | 0.173* |
| Mms Education is at least some tertiary | 0.338*** | 0.261*** | 0.149 | 0.338*** | 0.285*** | 0.222* | 0.303*** | 0.261*** | 0.132 |
| Mother's math ability score | 0.044 | 0.046* | 0.047* | 0.048 | 0.050*** | 0.070*** | 0.063 | 0.065 | 0.069 |
| Mother's vocab ability score | -0.018 | -0.033 | -0.044 | 0.038 | 0.027 | 0.051 | 0.112*** | 0.103*** | 0.054 |
| Mother's equality values factor | 0.022 | 0.032 | 0.022 | 0.066 | 0.006 | 0.059 | 0.003 | 0.004 | 0.032 | 0.031 | 0.027 |
| Mother's traditional values Factor | 0.050** | 0.042* | 0.037*** | 0.009 | 0.004 | 0.027 | 0.029 | 0.028 | 0.01 |
| Wealth index           | 0.090*** | 0.049 | 0.029 | 0.162*** | 0.131*** | 0.096*** | 0.049*** | 0.068** | 0.047 |
| Father lives in household | -0.049 | -0.074 | -0.064 | 0.039 | 0.009 | 0.023 | 0.01 | 0.01 | 0.028 |
| Grandparent lives in household | -0.055 | -0.027 | -0.029 | -0.043 | -0.023 | -0.065 | 0.004 | 0.014 | 0.04 |
| Constant               | 0.055 | 0.129 | 0.087 | 0.007 | -0.149 | -0.193 | -0.045 | -0.144 | -0.632*** | -0.607*** | -0.644*** |
| Adj. R2                | 0.053 | 0.099 | 0.128 | 0.144 | 0.034 | 0.11 | 0.122 | 0.133 | 0.018 | 0.094 | 0.102 | 0.157 |

All regressions include region fixed effects.

Huber-White standard errors

Bonferroni adjusted (n = 4) p-values: significance at * 10% ** 5% *** 1%

Regressions weighted by inverse probability weights & sample weights

Model 1 includes baseline child development scores, Model 2 adds baseline controls, Model 3 adds post-baseline confounders with the exception of parental stress, and Model 4 includes parental stress

### 3.2. OLS results

Children with mothers working for higher fractions of the past two years of children’s lives to date perform better on all tests (general, language, socio-emotional), while controlling for baseline values of the child development tests. The findings are not sustained, however, with the inclusion of a number of covariates, including household composition, demographic characteristics and socio-economic status (Table 2, Models 1 & 2). Covariates that are significant in the full model include gender, maternal education, and wealth across all tests; maternal math and language ability and maternal values are also significant for subscales. Male children perform worse than female children on all development tests, and there are positive associations with being from wealthier households or from having educated mothers. Mothers’ math scores are more strongly associated with cognitive development and vocabulary, while vocabulary is more strongly associated with behavior.

Inclusion of variables representing pathways connecting fraction of last two years worked and child development does not further change the associations between child outcomes and mothers’ labor force participation (Models 3 & 4, Table 2). Some of the newly-added variables are significant, however, including parental time in culture-sharing activities, fraction of the past two years in preschool, and the toy index. Having a larger number of toys is associated with better scores on all measures of child development, whereas only cognitive development is associated with

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association between mothers’ labor force participation and child outcomes (Table 4). Most of these regressions indicate the OLS regressions have sufficient controls that the mothers’ labor force participation intensity variable and the error terms are not correlated. One exception is the Battelle outcome of cognitive child development, where the IV results suggest an improvement on the OLS results. This result indicates an increase of about a quarter standard deviation of the child development score from a mother not working to working full time the entire two years between survey rounds.

Propensity score matching results indicate no significant differences in child development outcomes between children of women who worked full time between 2010 and 2012 and children of women who did not work during this time period (Table A6). The matching improved the balance of the sample, with the specification with only baseline control variables reducing mean and median bias by about 90% and satisfying criteria for both Rubin’s B (the absolute standardized difference of the means of the linear index of the propensity score in the treated and matched non-treated group) and Rubin’s R (the ratio of treated to matched non-treated variances of the propensity score index). The other specifications reduce mean and median bias by about 60% and satisfy Rubin’s R criteria.

4. Conclusion

Children who are three-years-old with mothers who have worked for higher fractions of the previous two years perform significantly better on all tests (general, language, socio-emotional) than children whose mothers have worked less, while controlling for baseline test performance. These main effects do not remain significant with the inclusion of a range of socio-economic and demographic control variables, however. This finding is robust in instrumental variable and propensity score matching approaches. The associations between mothers’ labor force participation and child outcomes are not altered with the inclusion of pathway variables (parental engagement, preschool, toy index and maternal stress). Child development outcomes are generally better for children whose mothers had a greater formal education, whose families had more toys, had less stress, had higher fractions of the previous two years perform better on assessments of cognitive, language, and socio-emotional development score from a mother not working to working full time the entire period. Yet the propensity score matching analysis fails to find an association between mothers’ labor force intensity and child development.

This work fits with literature that finds mothers’ labor force participation does not influence child development in the very early years, perhaps because we do not find parental time with children to be associated with maternal work. Specifically, we find no association between the number of parental hours spent in various activities (didactic, outings, culture sharing, household) and mother’s work intensity between child ages one and three years. This pattern is similar to that described in the US literature, which suggests that even though non-working mothers may spend more time with children, child-focused time is similar in quantity to that given by working mothers (Nock & Kingston, 1988) (Aguiar, Hurst, & Karabarbounis, 2013). Similarly, research on maternity leave in Canada indicates that although extra maternal care primarily crowed-out home-based care by nonrelatives, these caretakers are non-licensed; the level of expertise and time investment provided to children remained the same (Baker & Milligan, 2010).

Table 3:
First stage regressions.

| Instruments | Employed before child born | % of mothers working full time in the community | % of mothers working part time in the community | Community average of equality factor | Community average of traditional factor |
|-------------|-----------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------|----------------------------------------|
|             | 0.332***                    | 0.051                                         | 0.113                                         | 0.016                               | -0.03                                  |

| Child variables | Batelle | EEDP | Child sex (male = 1) | Number of siblings | Mother’s age at oldest child’s birth | Mother’s traditional score | Mother’s vocabulary score |
|-----------------|---------|------|----------------------|--------------------|------------------------------------|--------------------------|--------------------------|
|                 | 0.004   | -0.012 | 0.004               | -0.004             | 0.003*                             | 0.01                      | 0.01*                    |

| Mother variables | Mother’s education is secondary | Mother’s Math ability score | Mother’s Vocab ability score | Mother’s equality values factor | Mother’s traditional values factor |
|------------------|---------------------------------|----------------------------|-----------------------------|---------------------------------|----------------------------------|
|                  | 0.027                            | 0.006                       | 0.01*                       | -0.040***                      | 0.084***                        |

| Household variables | Wealth index | Father lives in household | Grandparent lives in household | Constant |
|--------------------|--------------|--------------------------|-------------------------------|----------|
|                    | 0.039***     | -0.099***                | 0.002                         | 0.195*   |

| Adj. R2 | 0.522 | 0.323 | 0.323 |

F-test of joint significance of the instruments

N = 2476
Huber-White standard errors
Significant at * 10% **5% ***1%

Regressions weighted by inverse probability weights x sample weights

greater parental time devoted to culture sharing activities and having a greater fraction of the previous two years enrolled in preschool. Better child development is associated with less parent-child disfunction for all three measures of child development.

With the exception of parental time with the children, the pathway variables are associated with mothers’ labor force participation (Table A5); more time in preschool and a higher value of the toy index are associated with increased labor force participation and stress is lower for mothers who spend a larger percentage of time working outside the home.

3.3. Robustness checks

That first-stage regressions in the IV analysis suggest that the instruments, particularly the indicator that the mother was employed before the child is born, are plausibly strong (Table 3); under-identification is rejected as in all instances the p-value of the test using the Kleibergen and Paap Wald F-statistic is less than 0.01. Second-stage regressions are similar to OLS results, which suggest no causal
Table 4
Instrumental variable analyses.

| Instrumental variable estimations: | Child Development Scores | N = 2476 |
|-----------------------------------|--------------------------|----------|
| 5 instruments: Employed before child born, % in geo. region working full time & part time, average in geo. region of mothers’ attitudes to equality and traditional values | Fraction of Last Two Years | 0.276** 0.075 0.051 |
| | Worked (IV) | (0.134) (0.135) (0.130) |
| | adj. R2 | 0.092 0.109 0.093 |
| | Hansen’s J | 0.340 0.492 0.024 |
| | p-value Anderson-Rubin test | 0.106 0.587 0.038 |
| 3 instruments: Employed before child born, % in geo. region working full time, % working part time | Fraction of Last Two Years | 0.283** 0.079 0.036 |
| | Worked (IV) | (0.134) (0.135) (0.130) |
| | adj. R2 | 0.092 0.109 0.093 |
| | Hansen’s J | 0.322 0.221 0.289 |
| | p-value Anderson-Rubin test | 0.077 0.339 0.504 |
| 1 instrument: Employed before child born | Fraction of Last Two Years | 0.301** 0.087 0.051 |
| | Worked (IV) | (0.135) (0.135) (0.131) |
| | adj. R2 | 0.091 0.108 0.093 |
| | p-value Anderson-Rubin test | 0.025 0.520 0.696 |

Bold indicate tests of overidentification (Hansen’s J) or Anderson-Rubin’s test of endogeneity did not pass Huber-White standard errors
Significant at * 10% **5% ***1%
All estimations include baseline controls and weights
Regressions weighted by inverse probability weights x sample weights
See Table 3 for included controls

Research in Latin America suggests little benefit for children from mothers’ labor force participation due to problems with alternative care, including the limited benefits found from low-quality childcare provision (Diaz & Rodriguez-Chamussey, 2016). In our study, we find preschool participation to be associated only with the composite child development measure (Batelle). Yet other studies from Argentina, Uruguay, and Chile confirm positive associations between preschool participation and better outcomes (Berlinski, Galiani, & Gertler, 2009; Berlinski, Galiani, & Manacorda, 2008; Cortázar, 2015), but effects of preschool are well-known to depend on preschool quality (Britto et al., 2016). Our results may differ from the other Chilean study due to differences in scope: the other study examined participation only in public preschool programs and measured achievement outcomes much later, in fourth-grade (Cortázar, 2015).

We find the toy index to be correlated with child development scores, which is similar to the findings of Son and Morrison (2010) who show improvements in the home environment are associated with improvements in children’s language scores. Our findings are also similar to research that indicates associations between parenting stress and child outcomes in the US context (Cnic, Gaze, and Hoffman, 2005). Yet we do not find associations between work intensity and child outcomes, suggesting that these theorized pathways (preschool, toys, and maternal stress) may not be functioning strongly in the Chilean context.

Our study has several limitations. The TVIP and CBCL tests are not available in both 2010 and 2012, making our value added approach less precise. We limit our sample to children three years of age and limit mothers’ work intensity to the previous two years; these choices reduce the generalizability of our conclusions to a broader age range. While our analysis attempts to identify causality, each estimation strategy has some limitations: the value-added specification may have endogenous unobservables; the instrumental variables with the strongest exogeneity argument are the weakest in terms of predictive power; and the propensity score matching approach only uses observations with labor force participation rates of 0 and 100%. Our pathways exploration is purely descriptive and limited to variables available in the dataset. A limitation of the parenting engagement analysis is that we cannot determine how other adults in the household such as grandparents may change their time spent with the children based on mothers’ work status. Also, the parental engagement, toy index, and maternal stress variables are not cumulative over the past two years.

This study has a number of strengths. We are able to account for mothers’ employment between survey rounds and control for baseline child development scores while including multilevel covariates to reflect an ecological framework. Instrumental variable and propensity score robustness checks allow us to reduce concerns about endogeneity. We use a large sample of children with three measures of distinct domains of child development. Finally, the data are from Chile, which provides a contrasting cultural context to the US, from where the much of the literature on this topic sources its data.

We also note that while mothers’ labor force participation is positively associated with child outcomes, other covariates have strong associations, too. Higher outcomes are consistently associated with mothers’ schooling and the wealth index. These associations suggest that improving women’s educational opportunities, intellectual abilities, and wealth could be effective methods for supporting child development, which are conclusions supported by existing literature (Bradley & Corwyn, 2002; Carneiro et al., 2013; Tong et al., 2007). Such policies would be complementary to supporting women’s work outside the home, and likely would be even more effective as the controls explain more of the variance in scores than the women’s work intensity variable.

If Chile’s trend of increasing women’s participation in the labor force continues, it may not directly translate into improved child development outcomes. We see higher child development scores associated with preschool participation, having access to toys, and reduced maternal stress. Though all of these potential pathways are associated with higher maternal employment, causal analyses suggest little direct impact of maternal work on child development. The government may wish to continue policies that encourage these pathways directly.

Ethics statement

This paper did not require ethics approval as the Encuesta Longitudinal de Primera Infancia (ELPI) is a publically available data base and is de-identified.

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Conflict of interest

No authors have any actual or potential conflict of interests

Appendix A

See Tables A1–A6.

Table A1
Rotated factor loadings (exploratory) on mother-child activities. Mother-child activities were used to determine the categories since about half the children's fathers are absent in the household.

| Survey question                                                                 | Women's equality | Traditional values | Logit regression used to generate IPW weights |
|---------------------------------------------------------------------------------|------------------|--------------------|-----------------------------------------------|
| A woman who is in charge of the greater part of family responsibilities does not have time to work for compensation outside the home. | -0.03            | 0.68               | -0.495*** (0.105)                              |
| Its best for all if the man leaves to work and the women stays at home with the family. | 0.67             | -0.13              | -0.422*** (0.107)                              |
| Men should take on a greater responsibility for domestic work and child care than they currently do. | 0.03             | 0.76               | 0.016 (0.067)                                  |
| If my partner earned enough, I would not work.                                    | 0.31             | 0.38               | 0.039** (0.018)                                |
| The best thing for a woman is to have children after developing a career.          | 0.78             | -0.13              | 0.491*** (0.180)                               |
| Weighing the good and the bad, it is very important to me to have paid work.       | 0.78             | -0.06              | 0.571** (0.243)                                |
| To have work is the best way for a woman to be an independent person.             | 0.68             | 0.14               | 0.118* (0.065)                                 |
| The dedication of the father and mother are equally important for the children's learning and emotional development. |                  |                    |                                               |

When a single question was left unanswered, it was assigned the mean.

Table A2
Logit regression used to generate IPW weights.

| Likelihood of being included in final sample | Batelle (2010) | EEDP (2010) | Child sex (male = 1) | Number of siblings (2010) | Mother's age at oldest child's birth | Mother's education is completed secondary | Mother's education is at least some tertiary | Mother's equality values factor | Mother's traditional values factor | Wealth index (2010) | Grandparent lives in household (2010) | Biological father lives in household (2010) | Constant | log likelihood | N |
|---------------------------------------------|----------------|--------------|----------------------|----------------------------|-------------------------------------|-------------------------------------------|-------------------------------------------|----------------------------------|--------------------------------------|-------------------|-----------------------------------------|------------------------------------------|----------|----------------|----|
|                                             | -0.495***      | -0.422***    | 0.016                | 0.039**                    | 0.491***                            | 0.571**                                   | 0.018                                     | 0.118*                           | 0.197***                             | 0.259                        | 0.334**                                  | 1.068*                                   | 1.068*   | -822.2986      | 2833|

Huber-White standard errors
Significant at * 10% **5% ***1%
Regressions weighted by inverse probability weights x sample weights

Table A3
Rotated factor loadings (exploratory) on mother-child activities. Mother-child activities were used to determine the categories since about half the children's fathers are absent in the household.

In the last 7 days, indicate the frequency with which the mother participated in the following activity with the child.

| Activity                                                                 | Didactic | Culture-sharing | Household | Outings |
|------------------------------------------------------------------------|----------|-----------------|-----------|---------|
| Read story books or look at books with pictures                         | 0.21     | 0.83            | 0.06      | 0.08    |
| Sing songs with the child                                              | 0.29     | 0.58            | 0.28      | 0.06    |
| Take the child to plazas or parks                                      | 0.07     | 0.16            | 0.08      | 0.75    |
| Take the child to museums, zoos, libraries, or Another cultural outing | 0.08     | 0.17            | -0.21     | 0.71    |
| Pass time with the child conversing or drawing                         | 0.21     | 0.28            | 0.66      | 0.00    |
| Invite the child to participate in the household chores (set the table, water the plants, etc.) | 0.36     | 0.14            | 0.53      | 0.21    |
| Take the child to the store, market, or grocery                        | 0.29     | 0.01            | 0.48      | 0.50    |
| Share a meal with the child                                            | 0.18     | 0.03            | 0.76      | -0.12   |
| Teach the animals and their sounds                                     | 0.81     | 0.19            | 0.14      | 0.11    |
| Teach the colors                                                       | 0.88     | 0.17            | 0.11      | 0.10    |
| Go out with the child to visit friends or family                       | 0.45     | 0.01            | 0.10      | 0.48    |
| Teach the numbers and counting                                         | 0.89     | 0.15            | 0.15      | 0.06    |
| Teach the alphabet                                                     | 0.88     | 0.16            | 0.13      | 0.06    |
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Table A4
Household Toy Index.

| Factor loadings |
|-----------------|
| Two or more games teach colors, sizes, shapes | 0.77 |
| Three or more puzzles | 0.77 |
| Stereo with children’s music | 0.56 |
| Toys for make-believe | 0.70 |
| Two or more games for learning numbers | 0.79 |
| At least 10 children’s books | 0.70 |

Table A5
Maternal work & pathways.

| Unconditional coefficients* |
|-----------------------------|
| Maternal work |
| Parental time in didactic activities | -0.569 |
| (0.819) |
| Parental time in Outings | -0.621 |
| (0.450) |
| Parental time in culture sharing activities | 0.274 |
| (0.509) |
| Parental time in household activities | -0.832 |
| (0.552) |
| Fraction of 2010–2012 in Preschool | 0.166*** |
| (0.013) |
| Toy Index | 0.250*** |
| (0.050) |
| Parental stress: parental distressa | -0.460*** |
| (0.054) |
| Parental stress: parent-child interactiona | -0.238*** |
| (0.046) |

N = 2476, N* = 1741
* Each coefficient is a separate regression with a single variable: the pathway variable
* Conditional correlations control for Maternal Work Intensity, other pathway variables, and ecological framework covariates

Table A6
Propensity Score Matching.

| ATT estimates from Matching on | Batelle | TVIP | CBCL | N* | N0 |
|-----------------------------|--------|-----|------|----|----|
| Baseline controls | 0.02 (0.08) | 0.01 (0.09) | 0.09 (0.08) | 1351 | 1379 |
| Baseline controls + most pathway variablesc | 0.01 (0.10) | 0.01 (0.10) | 0.09 (0.09) | 1341 | 1379 |
| Baseline controls + all pathway variables | -0.03 (0.11) | 0.05 (0.12) | -0.03 (0.11) | 909 | 952 |

Observations on the common support were matched within a 0.01 caliper
* Observations on the Common Support.
* Observations with 100% or 0% time worked between surveys.
* One excludes parental stress.

Observations on the common support were matched within a 0.01 caliper
* Observations on the Common Support.
* Observations with 100% or 0% time worked between surveys.
* One excludes parental stress.
