Maternal Work Conditions and Child Development

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Abstract

How do work conditions affect mothers' parenting behavior and thus, children's development? Combining data from the Child-Development-Supplement of the Panel Study of Income Dynamics and the Occupational Information Network allows us to shed some light on these questions. We employ various techniques including OLS with extensive controls, a value added approach and individual fixed effects in order to address potential endogeneity problems. Our results reveal that work-related stress negatively affects children's behavioral development via reducing the total amount of maternal care, but not via reducing the amount of educationally oriented time.

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1. INTRODUCTION

Maternal employment is nowadays commonplace in most industrialized countries. In the US, for instance, 71% of mothers with children below 6 years are working (2011 Bureau of Labor Statistics). Numerous studies have sought to understand the consequences of maternal employment on children's developmental outcomes. Studies have focused on understanding whether employment status (Desai et al., 1989; Baum, 2003; Ruhm, 2004, James-Burdumy, 2005, Bernal 2008, Schildberg-Hoerisch, forthcoming), work hours (Berger, et. al., 2005), timing of maternal work (Brooks-Gunn et al., 2002), and nonstandard work hours (Han 2005) relate to child development. While some of these studies show that maternal employment may improve intellectual performance through increasing household incomes (Blau and Grossberg, 1992), others have also shown that it is associated with lower outcomes among children (Baum 2003, James-Burdumy, 2005). Still others suggest that the effects may depend on the characteristics of mothers and families (see Ruhm 2000 and Brooks-Gunn, et al., 2002 for full review of the literature).

Less is known about how maternal work conditions affect children's cognitive and socio-emotional development. Jobs vary greatly in terms of the stress and hazards that are placed on workers. The psychological strain poor work conditions place on parents may negatively affect parenting behaviors in ways that go on to affect child development. Past studies have demonstrated a relationship between work characteristics and parenting behavior. For instance, studies have noted a positive relationship between working in a cognitively stimulating job and aspects of parenting behavior that may go on to positively influence children's cognitive development (Kohn and Schooler, 1982; Menaghan and Parcel, 1991 & 1995). Other studies that have focused on the relationship between poor work conditions and parenting

behavior have also shown that work-related stress is associated with parents being less attentive, more withdrawn, and irritable (Parke et al. 2004; Repetti and Wood, 1997; Stewart and Barling 1996). While these studies offer rich descriptive evidence on a potential mechanisms through which work characteristics may go on to affect children, they are largely based off small non-representative samples and/or do not directly address the problem of endogeneity of occupational choice.

In this paper, we examine a potential pathway through which maternal work conditions may influence child outcomes. Specifically, we examine how work conditions – in particular wages, work hours, job-related hazards and stress - might affect one aspect of parenting behavior that might foster child development, namely maternal time investments in children. To be more precise we distinguish between mother-child interactions in general and interactions dedicated exclusively to child development fomenting activities, such as reading, doing homeworks, performing arts and crafts or going to museums. We then examine how maternal time investments may affect child outcomes.

To do this, we use the 1997 and 2002 waves of the Panel Study of Income Dynamics-Child Development Supplement (PSID-CDS) to obtain comprehensive information on children's cognitive and behavioral development, time diary estimates of maternal time investments in children, children's demographic and physical characteristics as well as children's family, school and regional environment. Additionally, linking the PSID-CDS via mothers' occupations, classified according to a 3-digit code, with the Occupational Information Network (O*NET) allows us to obtain detailed, objective information on mothers' occupational conditions.

A major challenge to identifying a causal relationship between work conditions and parenting behavior arises because of occupational selection. For

example, mothers who are more likely to engage in practices that positively influence their children's development (i.e. reading to children, being more verbally engaging with children) may also be the ones that are the most likely to work in jobs that are less hazardous and less stressful. If this scenario were true then any estimate of the relationship between work conditions and parenting behaviors would be downward biased. In order to address this issue we pursue the following strategy.

We begin by looking at the correlates of maternal work conditions. This first step allows us to describe the types of mothers – in terms of their own own characteristics, their family background and social environment - who are most likely to be exposed to the different types of work conditions. In a second step, we employ different regressions methods to estimate the relationship between work conditions and parenting behaviors, net of potential confounding variables. We begin by controlling for an unusually rich set of covariates that simultaneously determine maternal time and occupational choice. Next, we estimate a value-added specification by adding in the lagged value of mothers' time investments. The underlying idea for this procedure is that previous parenting behavior might be a strong predictor of current parenting behavior and thus, proxy any unobservable characteristics of the mother determining her current parenting behavior. Finally, we estimate a fixed effect model that brings us one step further and eliminates any time constant characteristics of the mother which may simultaneously determine her work conditions and her interactions with her child.

We then move to determining the relationship between maternal time investments and child outcomes. As in the case of estimating the effect of work conditions on parenting behavior, estimating the effect of parenting behaviors encounters a problem of selection: mothers who are more concerned with the

development of their children, may provide them with better care. In order to address this issue, we pursue the three alternative estimation strategies suggested above. In other words, we use OLS with extensive controls, OLS augmented by the lagged dependent variable as well as fixed effect regressions.

In examining the relationship between work conditions and parenting behaviors, we find that work-related stress negatively affects the total quantity of time mothers devote to their children but not the quantity of educational time. Turning to our examination of the relationship between parenting behaviors and child outcomes, we find that total time reduces the likelihood of children having behavioral problems. Educational time is positively correlated with children's verbal skills. Overall, the results show that work-related stress may negatively affect children's behavioral development via reducing the total quantity of time children receive but not by reducing the amount of educationally oriented time.

The reminder of the paper is structured as follows. Section 2 describes briefly the underlying model of child development and Section 3 introduces the methodology used to identify the relation between maternal working conditions and children's development. Section 4 describes the datasets used for the analysis. The estimation results are presented in Section 5, while Section 6 finally concludes.

2. A MODEL OF CHILD DEVELOPMENT

In order to provide a better understanding how mothers' work conditions may affect children's development, we lay out a basic framework for modeling children's cognitive and non-cognitive development. This framework assumes that a child's

human capital formation is a cumulative process by which inputs are combined with a child's genetic endowment of mental capacity and personality: [1]

$$CP_{it} = CP\ (F_{it};\ S_{it};\ CP_{it-1};\ \mu_i) \qquad (1)$$

where CP_{it} is a child i's human capital in year t, which is determined by child i's genetic endowment μ_i , child i's previously accumulated human capital CP_{it-1}, and a variety of input factors. Commonly adopted input factors are related to the family as well as to the social environment. Hence, F_{it} refers to all family related input factors, and S_{it} to all input factors related to the social environment.

The social environment usually comprises features of the childcare facilities, the school as well as of the regional environment. With respect to the inputs related to the family, it is common to distinguish between investments in form of material goods and investments in children in terms of the quantity and type of parental time devoted to children. While the former is assumed to be mainly determined by financial resources, such as parents' labor earnings, other assets and accumulated wealth, the latter is usually assumed to be determined by parents' individual characteristics and their employment status. Research in sociology and psychology has shown that the parenting behavior may as well be affected by parents' work environment (Kohn and Schooler, 1982; Menaghan and Parcel, 1991 & 1995, Repetti and Wood, 1997). The rationale behind this is that the quantity and the quality of parental time investment deteriorates because of the fatigue and the stress associated with parental employment, in particular with hazardous or stressful jobs. As a consequence, our model additionally allows parental time investments to depend on parents' work

[1] The production function framework was first formally modeled by Ben Porath (1967) and has since served as the basis for much of the literature on skill aquisition in Economics. Leibowitz (1974) was the first to extend this framework to home investments in children.The approach outlined in this section draws upon Todd and Wolpin (2003) and Cunha et al. (2006). Notice, however, that we do not intend to model the determinants of all inputs into the production function, but only to provide the reader with a clear understanding of how mothers' work characteristics may influence their children's development.

conditions. Given that mothers still remain the primary caregiver, at least in terms of the time investment, we consider mothers' time explicitly and hence analogue also their work conditions. Fathers' time investments are only proxied by their education and labor market engagement.[2] The inputs of the child development production function are thus as follows:

$$F_{it} = F(G(MC_{it}; PC_{it}; HC_{it}; CP_{it-1}); T_M(WC_{it}; MC_{it}; PC_{it}; HC_{it}; CP_{it-1})) \quad (2)$$

$$S_{it} = F(CC_{it}; SC_{it}; RC_{it}) \quad (3)$$

where S_{it} refers to the social environment of child i at time t, which comprises features of the childcare facility (CC_{it}), in case the child is taken care of by somebody else than the mother, of the school (SC_{it}), in case the child is enrolled in school, and last of the regional environment (RC_{it}). The family inputs are both material investments and time investments. Material investments G are assumed to be determined by maternal characteristics (MC_{it}), paternal characteristics (PC_{it}) and features of the household (HC_{it}). With respect to mothers' time investment we assume it to be affected not only by mothers' individual characteristics (MC_{it}), their partners' characteristics (PC_{it}) and their family background (HC_{it}), but as well by mothers' working conditions (WC_{it}).[3] Additionally, as mentioned above, mothers are assumed to adjust their investments, both in form of goods and time, to their children's prior development, indicated by CP_{it-1}.

When modeling mothers' work conditions, we include both monetary and non-monetary characteristics of occupations. First, previous literature suggests that non-monetary aspects of occupations, such as work hours, work-related hazards and stress,

[2] One important reason for this decision is the rather poor quality of the data on father-child interactions. Notice,morever, that other studies, for instance Schildberg-Hoerich (forthcoming), have not found any significant impact of paternal time on children's education.

[3] We are aware that mothers' time investments might furthermore be influenced by their environment, e.g. by the availability of formal or informal childcare. Nevertheless, allowing for further dependencies of mothers' time investment complicates the exposition of the model and does not matter for the results, given that the final estimation takes place in reduced form.

predict both child outcomes and parenting behaviors (Menaghan and Parcel, 1990, 1991 and 1995; Repetti and Wood, 1997; Berger et al., 2005). A main goal of this study is to better identify these relationships. Second, the theory of compensating wage differentials argues that a job is a bundle of wages and disamenities, and that workers who are exposed to certain job-related disamenities receive some financial compensation (Smith, 1776 and Rosen, 1986). To the extent that greater income can increase the material inputs that influence child development, any detrimental effects of deleterious work conditions may be offset by higher wages. Hence, it is important to control for both aspects of jobs, monetary and non-monetary factors.

Work conditions, such as work hours, hazards and stress, are expected to reduce maternal care. Assuming that mother-child interactions stimulate children's development, we expect work hours, work-related stress and hazards to harm children's development. Wages, however, are assumed to influence children's human capital and personality formation directly in a positive manner.

3. ESTIMATION

The empirical analysis estimates the outlined functions in reduced form and is divided into two parts. First, we analyze the impact of maternal work conditions on different measures of mothers' time investment into their children. Second, we investigate to which extent these measures of maternal time influence their children's development.

As indicated above, the major threat for identification is the inherent selection problem: mothers, who are more concerned to provide their children with good care, might sort into different occupations. Analogously mothers, who are more concerned with the development of their children, might provide their children with better care.

In order to tackle this selection problem, we use the estimation strategies described in turn.

One way of addressing the potential source of bias due to occupational selection is to use an unusually rich data set to control for all observable characteristics that might simultaneously determine parenting styles and occupational choice. Here we use data from a large and nationally representative sample of children and families to account for an exhaustive set of characteristics that might simultaneously determine occupational choice, parental care and child development (for more details please refer to Section 4). Yet, as conditioning on observables may not account for bias due to unobservables, this approach suffers from drawbacks.

One strategy in order to address a potential bias due to unobservable characteristics is to control for the lagged dependent variable. Past maternal care is likely to be a strong determinant of current maternal care. Moreover, past maternal care might be correlated with the type of job a mother works in. In other words, past mother-child interactions might serve as a proxy for mothers' underlying preferences towards family and career. As a consequence, we control not only for an exhaustive set of characteristics describing the mother, the child, the family background and the neighborhood, but also include the lagged value of the respective maternal time investment in our first set of regressions. In a similar vein, children's past performance in cognitive or non-cognitive tests serves as a good predictor for current performance in the respective test. Additionally, mothers might adjust the intensity of the care they provide to their children according to their children's development. Thus, we augment the child development regressions by a lagged measure of children's performance.

While controlling for the respective lagged dependent variable brings us one step further, there might still be further confounding variables that bias the estimates. One alternative estimation strategy, which allows us to eliminate any time-invariant unobservable characteristics, such as underlying personality features of the mother or innate ability of the child, is a fixed effect method. Given that we only possess of observations from two periods, this corresponds to an estimation using all variables in first differences. Thus, we identify the impact of maternal work conditions on maternal care as well as the impact of maternal care on children's development using changes over time.

While addressing any endogeneity due to time constant determinants of occupational choice, parenting styles or child development, it is important to mention that this strategy does not allow us to get hold off any time-varying unobservable determinants. Examples for time-varying features that may threaten our identification strategy are for instance any unobserved shocks, such as unexpected changes in children's development that may cause mothers' to switch jobs or adjust their child care.

4. THE DATA

4.1. The datasets and the sample

Our identification strategy requires a longitudinal dataset that provides information on children's cognitive and non-cognitive outcomes, parenting styles, maternal work conditions and further background information. The data used in this study - the Child Development Supplement (CDS) of the Panel Study of Income Dynamics (PSID) - is, to the best of our knowledge, the only longitudinal dataset that provides information on almost all the required dimensions.

The PSID is a longitudinal, nationally representative study of individuals and families in the United States. It contains comprehensive information on individuals' personal and professional background. In 1997 and 2002, the PSID administered the CDS to include measures of cognitive and non-cognitive skills as well as time diaries of up to two children per parent(s) already included in the original PSID sample.[4]

Despite providing detailed information on parents' professional backgrounds, such as employment status, occupation, wages or work hours, the PSID lacks any information on work-related stressors such as hazards or stress. For this purpose, we consult the Occupational Information Network (O*NET),[5] which is a comprehensive database of worker attributes and job characteristics. The information contained in the O*Net draws upon the ratings of occupational analysts as well as surveys from a broad range of workers employed in the respective occupation. Overall, it provides us with detailed information on average characteristics of the workers and the jobs belonging to 965 occupations which correspond to the 3-digit rating of the Standard Occupational Classification. The average occupational features, which are of interest for our study – in particular characteristics which describe the amount of hazards and stress – can be matched to the sample of mothers in the CDS/PSID via the 3 digit-occupational code.

Using information on occupational characteristics has the advantage of providing rather objective information on the individual work situation. In other words, the description of work conditions on the occupational level does not reflect any individual perception of the work environment. Yet, one disadvantage of using

[4] Unfortunately from 1997 onwards, the PSID is operated only every second year. As a consequence, all variables which are taken from the PSID – which are maternal work conditions as well as any information about the family background – are measured in 1997 and 2001, and not as ideally wanted in 1997 and 2002.

[5] The O*NET is the online replacement of the Dictionary of Occupational Titles and is accessible through the O*NET Online website http://online.onetcenter.org/.

average occupational features is that such measures might only imperfectly describe the individual work environment. Given the absence of any information about work-related stressors in the PSID, we need to rely on average occupational characteristics only and cannot compare alternative measures.

From the initial sample of children who were present in both waves of the PSID-CDS we drop those children for whom we do not possess complete information on test scores nor on mother-child interactions. We additionally restrict our main sample to children whose mothers are working and report their occupational code. The final sample contains 930 children, who are between 0 and 12 years old when first interviewed and 5-17 years old when for the second time assessed.

We would like to emphasize that the final sample consists only of children whose mothers are employed at the time of the survey. Note that this sample is appropriate for the specific goal of this study: we are not interested in comparing children whose mothers are working versus children whose mothers are staying at home, but we want to evaluate the impact of a marginal change in mothers' working environment, such as an increase in wages, a reduction in working hours or an improvement in non-monetary terms, conditional on the mothers being employed. To the extent that working mothers differ from non-working mothers in observable and unobservable characteristics, our results may, however, not be generalizable to children of non-working mothers.

4.2. Variables of interest and descriptive statistics

In turn, we introduce the main variables, such as the measures of children's cognitive and non-cognitive achievement, mothers' work conditions as well as mother-child interactions. Table 1 presents the descriptive statistics of the study variables.

The CDS provides detailed information on both children's cognitive and non-cognitive development in 1997 and 2002. The Woodcock Johnson Revised Test of Achievement (WJ-R) measures the cognitive performance. The WJ-R is a widely recognized measure of cognitive ability. Verbal ability is measured using two subtests: vocabulary and reading comprehension. Analytical/math ability is measured using tests of applied problem solving skills. Two indicators of behavioral problems measure children's non-cognitive development. First, the Internal Behavior Problem Index captures negative feels children's may have towards themselves, adults and other children. Second, the External Behavior Problem Index measures characteristics such as sudden mood changes, anxiousness, meanness towards others, etc. In the case of the WJ-R test a higher value signifies a better performance; in the case of the Behavior Problem Indices a higher value signifies more problems. All child development indices are standardized to have a mean of 0 and a variance of 1.

Mothers' work conditions are taken from the CDS/PSID and the O*Net. The CDS/PSID provides information on work hours, measured as hours per week, wages, and the occupational code, while the O*Net contains occupational features related to hazards and stress. As mentioned above, the O*Net provides detailed information on a set of features describing the type and amount of hazards and stress involved in mothers' occupation, in particular the requirement of common or special safety equipment, exposure to contaminants, risk of diseases or infections, hazardous conditions or equipment, radiation, whole body vibration, minor burns or bits, very hot or cold temperatures, dangerous positions, frequency of conflict situations, contact to unpleasant and verbally or physically aggressive people, level of competition and time pressure. Each of these features is measured on a scale from 0-100 where 0 indicates no exposure to the respective condition at all and 100 indicate full exposure

to the respective condition. For the purpose of significance and plausible interpretation, we develop a factor-based scale, constructed employing factor analysis.[6] The two resulting indices, summarized as "workload" and "hazards", are standardized to a zero mean and a variance of one.

For illustrative purposes, Table 2 presents the average scores for the hazard and stress indices for the most common occupations in our sample. Childcare workers are exposed to the most typical levels of hazards (-0.19 sd) and stress (0.09 sd). Accountants experience the least amount of hazards (-1.23 sd) and the least amount of stress (-1.86), while assemblers experience the most amount of hazards (1.54 sd) and investigators the most amount of stress (2.21 sd). Nurses and restaurant managers experience both above average stress and hazards levels (1.02 sd hazards and 1.46 sd stress, and 0.78 sd hazards and 1.62 sd stress, respectively).

A unique aspect of the PSID-CDS is the time use module. Up to two children in each family were asked to complete a random weekend and a random weekday time diary. Time diaries collected information on the type of activities that were performed and the duration of time spent on each activity. In addition, it also collected information on who was present with the child for each activity. Based on this information, we can construct measures for the quantity of maternal care. We first construct a measure of the total hours per week mothers spend with children. Next, we consider only the time mothers spend with children performing activities that may more directly affect human capital development. These activities include reading, performing arts and crafts, going to museums and doing homework together. Based on the information regarding the type of activities, we construct a variable summarizing the total hours per week mothers spend with children performing

[6] In particular, we estimate a maximum likelihood equation, which enables us to discover the latent structure of our set of variables. Applying varimax rotation to the factors from the first stage yields two indices comprising the various hazards on the one hand and stress factors on the other hand.

educationally oriented activities. Additionally, we consider the percentage of total time that is devoted to educationally oriented activities.

Finally, we control for the standard set of child characteristics that is commonly examined in the child development literature, namely children's gender, age, race, as well as weight and health status at birth. With respect to mothers' characteristics, we consider mothers' marital status, education, verbal skills, as well as age at child birth. With respect to fathers' characteristics, we control for their presence, their age at childbirth, their education as a proxy for the amount and quality of the time they spent with their children, their' employment status, and their labor earnings. Concerning the home environment, we include variables that measure the presence of siblings, the presence of grandparents at home, family income and savings as well as an index measuring the cognitive support a child experiences at home (such as the number of toys, books at home, frequency of theater, museum visit, etc). We furthermore control whether the child attended extra-familiar care during preschool ages. As far as the social environment is concerned, we include measures such as the safety of the neighborhood, the size of the next bigger city and the degree of urbanicity.

Notice that all of the control variables, with the exception of variables describing the financial background, are included as dummy variables allowing for a nonlinear impact of the respective control variable. Moreover, in the case of the fixed effect analysis we can only include the variables which are available for both periods.

5. RESULTS

In line with the identification strategy, the presentation of the results is divided into two parts. First, we analyze how mothers' work environment relates to mothers'

time investments (see section 5.2). Second, we investigate whether these aspects of maternal care may act as potential mechanisms through which mothers' work conditions may affect children's human capital and personality formation (see section 5.3). Yet, before addressing these specific questions we want to shed some light on mothers' selection into particular occupations as this might help us to gain some intuition about which mothers are exposed to work-related stressors (see section 5.1).

5.1. Selection into specific work conditions

Table 3 displays correlations between mothers' background characteristics and the level of hazards and stress mothers are exposed to at work. Additionally, it displays correlations between adjustments over time (between the two consecutive waves of the PSID-CDS) regarding both work conditions as well as background features. Thus, the first set of correlations helps us to understand which are potentially confounding variables in the OLS regressions, while the second set helps us to get some idea about potentially remaining confounding variables in the fixed effect regressions.

To begin with, mothers' endowment at the beginning of their career, such as their education and verbal skills, seems to be among the most influential determinants of their working conditions. Education appears to be the most important prerequisite for favorable working conditions: mothers who have dropped out of high-school are significantly more likely to be exposed to hazards than their more educated counterparts. Mothers with a high school degree have still a higher propensity to be exposed to work-related hazards, while mothers' with a college degree are less likely to work under hazardous conditions. The amount of hazards mothers are exposed to at work is also strongly correlated to mothers' verbal skills. In particular, mothers with a relatively low verbal skill endowment (below the median) work in more hazardous

job. Interestingly, the correlations regarding the level of stress stand in stark contrast to the correlations regarding the level of hazards: less educated and less verbally skilled women are exposed to a lower level of stress than higher educated and higher verbally skilled women.

A similar picture arises with respect to women's socio-economic background. Women from more advantaged families – in particular in terms of the financial situation of the family measured by the overall family income, the employment status or the earnings of their partner, but also in terms of education of their partner or the safety of the neighborhood - are less likely to work under strenuous conditions. The socio-economic background does, however, not seem to play a role for the level of stress involved in a mothers' occupation.

Besides the socio-economic background, also the cultural background appears to be a decisive factor regarding mothers' work environment. While white mothers are less likely to work under hazardous conditions, black and Hispanic mothers are more likely to be exposed to hazards. Hispanic mothers are, however, less likely to be exposed to stress at work.

The mutual correlations between work-related stressors reveal an interesting pattern: it seems that there is a trade-off between work-related hazards and stress. Women who work under hazardous conditions seem to be less likely to be exposed to stress, and vice versa. The level of stress is, however, positively related to working hours and wages.

The trade-off between work-related hazards and stress becomes furthermore apparent when analyzing the correlations between adjustments in women's professional and personal conditions over time. When changing into an occupation involving a higher level of hazards, women reduce the level of stress, and vice versa.

Improvements in women's working conditions are furthermore strongly correlated with their partner's situation. In case the partner completes further education or receives a pay raise, women are able to change into a less hazardous job. The opposite is true in case of separation from their partner. This fact is rather worrisome given that many social programs targeted to single mothers depend on the woman being working.

5.2. Work conditions and parenting styles

Our theoretical framework postulates that maternal care influences children's human capital formation. Thus, we explore the link between deleterious work conditions and different measures of mother-child interactions – overall time, time dedicated exclusively to child development fomenting activities and the share of cognitively stimulating activities of mothers' overall time. Table 4 displays the results regarding these different aspects of maternal time. It is structured as follows: column (1) contains the results from OLS regressions clustering observations on the family level and controlling for mothers' work conditions only, column (2) displays the results when adding in any observable background characteristics, column (3) when additionally controlling for the lagged measure of the respective time investment and column (4) finally presents the estimates resulting from the fixed-effect analysis.

Overall, we can see that work-related stressors correlate significantly negatively with maternal time investments (see Table 4, Panel A, Column 1). This is equally true for work-related hazards and stress: an increase by one standard deviation is associated with a decrease in maternal time by 1.268 hours per week and 1.509 hours per week, respectively. Interestingly, work hours and wages do not correlate significantly with mothers' time devoted to their children.

The negative correlation between maternal time and work-related hazards can in part be explained by observable differences in mothers' individual and family background (see Table 4, Panel A, Column 2). For instance, mothers' verbal skills correlate not only with mothers' work conditions (see Table 3), but also with mothers' time devoted to their children: mothers with worse verbal skills devote on average 2.33 hours per week less to their children than mothers with better verbal skills (see Table A1 in the Appendix). Moreover, past measures for the quantity of maternal care are strongly correlated with current measures for the quantity of maternal care: a one hour increase in maternal care in 1997 leads to an increase of 0.08 hours more maternal care in 2002 (see Table A1 in the Appendix). The negative correlation between mothers' total time dedicated to their children and work-related hazards seems to be fully explained by differences in mothers' unobservable preferences or attitudes: once we employ a fixed effect method the coefficient of hazards turns insignificant.

In contrast to the impact of work-related hazards, the impact of work-related stress on mother-child interactions persists even when controlling for time constant unobservable characteristics of the women and their family background (see Table 4, Panel A, Column 4). To be more precise, women who are exposed to one more standard deviation stress at work provide their children with 1.18 hours per week less care.

Comparing the impact of stress to the impact of working hours might help to get some better intuition about the effect of work-related stress. As we can see, the impact of working hours on maternal time only becomes only apparent when controlling adequately for differences in women's individual features (see Table 4, Panel A, Column 4): one more hour work per week leads to a reduction of 0.15 hours

in maternal care. In others words, one day of full time work (8 hours) has the same impact on maternal care, in terms of quantity, as a one standard deviation increase in work-related stress.

When restricting mother-child interactions to activities purely dedicated to the stimulation of children's human capital formation – such as reading, doing arts and crafts and doing homework together - work conditions do not seem matter in any significant manner, neither monetary nor non-monetary aspects of the job (see Panel B of Table 4 and Table A2 in the Appendix). The same pattern is observed when examining the percentage of mothers' total time that is dedicated to performing child development enhancing activities (see Panel C of Table 4 and Table A3 in the Appendix). Notice, however, that mothers' wages affect the fraction of mothers' time dedicated to purely development stimulating activities. The size of the effect is, however, negligible.

Taking together, results seeking to examine how work conditions predict mothers' time investments show that work-related stress leads to a reduction in the amount of mother-child interactions. Yet, exposure to stress or hazards does not seem to affect the amount of pedagogical time mothers devote to their children.

5.3. Maternal care and child development

The remaining step is to understand to which extent the different types of mothers' time matter for their children's development. Table 5 and 6 display the results for the impact of overall maternal time and developmental time on children's developmental indicators, respectively. We employ ordinary least squares and cluster standard errors at the family level. Notice, that column (1) displays pure correlations without controlling for further background characteristics, column (2) includes the full set of controls, such as child, mother, father, family and neighborhood

characteristics, column (3) takes additionally children's lagged performance in the respective test into consideration, and column (4) shows the results from a fixed effect regression.

Raw correlations between maternal time and the different measures for children's cognitive performance are mostly as expected (see Table 5, Column 1). All three cognitive measures, the letter word score, the passage comprehension score and the applied problem solving score are significantly positively correlated with the amount of time mothers devote to their children.

The picture, however, changes as soon as we control for the comprehensive set of current and past background characteristics (see Table 5, Column 2). When looking at children's abilities with respect to vocabulary, passage comprehension and applied problem solving skills, maternal time does not seem to have a noteworthy effect. The most severe loss in magnitude and in significance is observed once we control for mothers' education and cognitive ability, proxied by verbal skills. Maternal education and verbal skills are significantly and strongly positively correlated with children's cognitive scores (see Table A4-A6 in the Appendix): in comparison to children whose mothers graduated from high school, children's whose mothers dropped out of high school score on average 0.487 sd lower in the letter word test, 0.206 sd lower in the passage comprehension test and 0.270 sd lower in the applied problem solving score (all effects are significant at the 5% significance level). Children whose mother completed college fare significantly better in the letter word score and the passage comprehension tests than children of the mothers who are high school graduates (0.155 sd and 0.177 sd, respectively). Moreover, children with mothers whose verbal skills are below the average yield 0.280 sd less in the letter words test, 0.294 sd less

in the passage comprehension test and 0.239 sd less in the applied problem solving test than children with mothers whose verbal skills are above the average.

Lagged test scores seem to play the most important role in explaining children's cognitive abilities (see Table A4-A6 in the Appendix). A one standard deviation increase in past test scores corresponds to a 0.564 sd increase in current letter word test scores, a 0.400 sd increase in current passage comprehension test scores and a 0.430 sd increase in current applied problem solving test scores.

At first sight it seems that the influence of mothers' time on children's personality formation is rather negligible. We do not observe any significant correlation between mothers' time and children's behavior (see Table 5, column 1). Even when controlling for the full set of background characteristics the regression results do not reveal any significant relation between mothers' working conditions and children's personality development (see Table 5, column 2).

Only when taking into account children's past behavioral problems it becomes apparent that maternal care does matter for children's personal development (see Table 5, column 3). Previous diagnosis of behavioral problems is the most powerful predictor of children's later personality development (see Table A7-A8 in the Appendix): earlier prevalence of behavioral problems predicts also more current behavioral problems, in both dimensions internal and external problems (a higher prevalence of earlier behavioral problems - by one standard deviation - relates to higher internal problems by 0.391 sd and to higher external problems by 0.524 sd). Once we control for the respective lagged behavioral problem score, the coefficient of maternal time shows up significantly pointing towards a reduction in children's internalized behavior problems by 0.002 sd when maternal care is increased by one hour per week. This effect remains significant and even increases slightly when taking

also unobservable time constant differences either regarding the mother or the child into account. Thus, maternal time matters for children's self-confidence and feelings towards other people: one hour more care provided by the mother affects children's internalized feelings by 0.023 sd. Interestingly, maternal time does not seem to matter for any type of externalized behavior problems, such as sudden mood changes, anxiousness or meanness towards other children.

The picture looks quite different once we narrow the focus on maternal time devoted explicitly to development stimulating activities, such as reading, playing, doing arts and crafts and doing homework together.[7] As we can see in Table 6 Column 1, children's cognitive development is significantly correlated with the amount of pedagogical activities mothers undertake with their children. One hour per week more devoted to any activity promoting children's human capital formation is significantly associated with children's letter word score (0.018 sd), passage comprehension score (0.008 sd) and applied problem solving score (0.013 sd). While the positive impact of these activities on children's abilities regarding comprehension and applied problem solving can be mainly explained by mothers' own cognitive endowment (see Table A10 and A11 in the Appendix), the significant impact of these activities on children's vocabulary is slightly reduced, but remains significant when taking observable differences regarding the child, the mother, the father, the family or the neighborhood into consideration (0.013 sd). Children's innate or previously acquired abilities as well as mothers' unobserved parenting capacities play a role in shaping children's language skills, but the time mothers devote to further development enhancing activities still contributes significantly to their improvement: the results of the fixed effect analysis (see Table 6, Column 4) indicate that mothers'

[7] Table A9-A13 in the appendix display the full set of estimation results regarding the impact of mothers' developmental time on the different skill measures.

time devoted to development stimulating activities improves children's vocabulary by 0.008 sd. Interestingly, the amount of time devoted to human capital enriching activities, does not seem to influence children's behavioral problems (see Table 6).

Summarizing these findings, we can state that mothers' time has a significant impact on children's development. It is, however, remarkable that the determinants of children's cognitive abilities and behavior seem to be quite different. While mothers' overall time plays an important role for children's behavioral development, it is rather mother-child interactions devoted explicitly to children's human capital formation that promote children's cognitive skills.

Taking into consideration the results regarding the impact of mothers' working conditions on parenting styles, it becomes clear that exposure to a higher stress level affects children's behavior via a reduction in maternal care. To be more precise, children suffer under their mothers being exposed to work-related stress in terms of their self-confidence and confidence in other adults and children. The magnitude of the effect is, however rather small: a one standard deviation increase in work-related stress leads to a reduction of maternal time by 1.18 hours which increases children's internalized problems by 0.002 sd.

6. DISCUSSION AND CONCLUSION

This paper examines the relationship between maternal work conditions and parenting behaviors, on one hand, and the relationship between parenting behaviors and child outcomes, on the other hand. In doing so, we seek to determine whether maternal work conditions affect parenting behaviors in ways that might affect child development. We analyze the 1997 and 2002 waves of the Child Development Supplement of the Panel Study of Income Dynamics, which provides us with detailed

time diary data and child outcomes, and link it to the O* Net, which offers us detailed information on occupational characteristics. In order to address potential endogeneity problems, we employ various techniques including OLS with extensive controls, a value added approach and individual fixed effects models.

In sum, the results of the first part of our analysis show that exposure to work-related stressors, in particular work-related stress, leads to a reduction in mothers' overall time devoted to their children. Interestingly, time devoted to development stimulating activities, such as reading, supervising home work, etc., is not affected by exposure to work-related stress. Turning to the second part of our analysis, the results reveal interesting findings. Cognitive skills and behavioral outcomes of children seem to be shaped by different aspects of maternal care. While the overall attention children receive from their mother influences children's behavior, it is only the time devoted to educational activities that seem to improve children's cognitive development. Combining the results of the two parts of our analysis reveals that exposure to work-related stress has detrimental effects for children's behavior.

Some caveats apply to our study. First, while we use various estimation techniques and extensive current and lagged characteristics to account for both observable sources and time invariant sources of endogeneity, we cannot control for unobserved time-varying maternal or child characteristics that might bias our estimates. Unexpected leaps or lags in children's development, for instance, might cause mothers to adjust their work situation and their parenting behavior. If this were true, our estimates for the impact of mothers' exposure to work-related stress on mother-child interactions might represent an overestimate.

Moreover, while our measures of time investments are more reliable and less susceptible to social desirability bias in contrast to retrospective reports of time use,

our measures are limited in that sense that they cannot capture nuances of parent-child interactions, such as warmth, responsiveness and verbal stimulation[8]. As a result, we cannot directly answer questions such as whether working in a stressful work environment might lead to parents to be less responsive or attentive in ways that might be detrimental to child development. Yet, if this were true, our results represent an underestimate of the true effect of mothers' exposure to work-related stress on their children's development. Despite this limitation, the quantity of parental time is widely cited as an important input into the production of children's human capital (Becker 1991; Coleman 1988) and we employ the most reliable measures of time investments currently available.

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[8] Time diaries focus on capturing the chronology of events over a short period of time. This approach has been shown to be more reliable and less subject to social desirability bias than data collected from traditional, survey-based questions that ask individuals how much time they spend performing specific activities (PSID-CDS User Guide, 1997). While there are no baseline studies that have tested the consistency, validity, and reliability of time use reports from survey-based methods, substantial research has shown the time diary approach to be reliable and valid (Juster, 1985; Robinson, 1985).

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FIGURES AND TABLES

Table 1: Descriptive Statistics

	Mean	Std. Dev.	Min	Max
Children's assessment				
Std. letter word score 2002	0.0000	1.0000	-3.7362	4.1854
Std. passage comprehension score 2002	0.0000	1.0000	-6.1840	4.9565
Std. applied problem solving score 2002	0.0000	1.0000	-3.2276	3.9108
Std. behavior problems internal 2002	0.0000	1.0000	-0.9746	3.6463
Std. behavior problems external 2002	0.0000	1.0000	-1.3683	2.7888
Std. letter word score 1997	0.0000	1.0000	-3.0542	5.3993
Std. passage comprehension score 1997	0.0000	1.0000	-3.3436	2.9867
Std. applied problem solving score 1997	0.0000	1.0000	-4.3331	2.9937
Std. behavior problems internal 1997	0.0000	1.0000	-0.9490	3.7580
Std. behavior problems external 1997	0.0000	1.0000	-1.4690	2.4948
Mothers' work conditions				
Std. hazards 2001	0.0000	1.0000	-1.2801	3.2697
Std. Stress 2001	0.0000	1.0000	-2.3098	2.2048
Mom's work hours/week 2001	35.4032	13.7672	10.0000	85.0000
Mom's wage/hour in US$ 2001	13.5176	8.0161	0.3000	49.4800
Std. hazard 1997	0.0000	1.0000	-1.3062	3.2682
Std. stress 1997	0.0000	1.0000	-2.4428	2.1403
Mom's work hours/week 1997	27.3430	18.0068	10.0000	75.0000
Mom's wage/hour 1997	4.2509	5.6196	0.0100	25.0000
Mother-child relation				
Total time/week (in hours) 2002	34.7301	15.0547	1.8333	99.7500
Total time/week (in hours)1997	44.2608	17.8385	2.2500	107.4333
Develop. time/week (in hours) 2001	7.4882	7.5891	0.0000	55.3333
Develop. time/week (in hours) 1997	5.7848	6.9998	0.0000	57.1667
Mom's characteristics				
Mom's age at childbirth	27.9409	5.7489	15.0000	45.0000
Single mom (=1 if yes) 2001	0.2591	0.4384	0.0000	1.0000
Mom education (in years) 2001	12.8194	3.5146	0.0000	17.0000
Single mom (=1 if yes) 1997	0.2290	0.4204	0.0000	1.0000
Mom education (in years) 1997	12.5581	3.9786	0.0000	17.0000
Std. Mom's Verbal Skills 1997	0.0000	1.0000	-5.1017	2.2373
Father's characteristics				
Dad's age at birth	30.9439	5.8635	17.0000	59.0000
Dad's education (in years) 2001	13.5839	2.3569	3.0000	17.0000
Dad’s employment (=1 if working) 200	0.8853	0.3188	0.0000	1.0000
Dad's wage 2001	22.4469	15.6536	0.0200	112.0400
Dad's education (in years) 1997	13.5526	2.3229	3.0000	17.0000
Dad's employment status 1997	0.9261	0.2618	0.0000	1.0000
Dad's wage 1997	18.1259	13.2273	0.6700	144.3000
Home characteristics				
Number of siblings 2002	1.3613	0.3321	0.0000	10.0000
Grandparents in the household 2002	0.0140	0.1175	0.0000	1.0000
Family Income in US$ 2002	52206	45665	50	577000
Savings in 2002	0.5065	0.5002	0.0000	1.0000
Cognitive Support 2002	9.8623	2.2806	3.0000	14.0000
Number of siblings 1997	2.1570	1.0107	1.0000	10.0000
Grandparents in the household 1997	0.0237	0.1521	0.0000	1.0000
Social Environment				
No extrafamiliar care (=1 if yes)	0.2054	0.4042	0.0000	1.0000
Neighborhood (1=safe, 5=unsafe) 2002	2.0946	1.0415	0.0000	5.0000

City size: > 0.5 mio. people 2001	0.1656	0.3719	0.0000	1.0000
City size: 100k-499k people 2001	0.2688	0.4436	0.0000	1.0000
City size: 50k-99k people 2001	0.1280	0.3342	0.0000	1.0000
City size: 25-49k people 2001	0.1097	0.3127	0.0000	1.0000
City size: 10k-24k people 2001	0.1667	0.3729	0.0000	1.0000
City size: < 10k people 2001	0.1613	0.3680	0.0000	1.0000
Rural urban code (1= urban, 10 rural)	3.3419	2.3598	1.0000	10.0000
Neighborhood (1=safe, 5=unsafe) 1997	1.7054	1.3477	0.0000	5.0000
Child characteristics				
Age of child 2002 (in years)	10.8129	3.4388	6.0000	17.0000
Child is Male (=1 if yes)	0.4989	0.5003	0.0000	1.0000
Child is White (=1 if yes)	0.5538	0.4974	0.0000	1.0000
Child is Black (=1 if yes)	0.3559	0.4790	0.0000	1.0000
Child is Hispanic (=1 if yes)	0.0441	0.2054	0.0000	1.0000
Child's low birth weight (=1 if yes)	0.0409	0.1981	0.0000	1.0000
Child in bad health at birth (=1 if yes)	0.0957	0.2943	0.0000	1.0000

Table 2: Most Frequent Occupations of Mothers

Rank	Occupation	%	Cumul. %	Hazards	Stress
1	Elementary school teacher	5	5	-0.757	-0.080
2	Managers & administrator	5	9	-0.652	0.673
3	Bookkeeper	4	13	-0.952	-0.462
4	Secretary	4	17	-0.505	-0.175
5	Nursing aide	3	20	0.381	0.469
6	Child care worker	3	23	-0.187	0.087
7	Registered nurse	3	26	1.015	1.463
8	Clerical worker	3	28	-1.009	0.043
9	(Pre-)kindergarten teacher	2	31	-0.453	-0.547
10	Investigator	2	33	-0.925	2.205
11	Assembler	2	35	1.536	-1.346
12	Cleaner	2	37	1.017	-1.662
13	Accountant	2	39	-1.230	-1.861
14	Office manager	2	41	-1.009	0.043
15	Sales woman	2	43	-0.404	0.436
16	Cashier	2	45	-0.314	0.799
17	Social worker	1	46	-0.722	1.513
18	Restaurant manager	1	47	0.776	1.617
19	Cook	1	49	1.526	0.195
20	Clerical supervisor	1	50	-0.652	0.673

Table 3: Precipitants of the level and changes in hazards and stress

	Level		Change	
	Std. hazards	**Std. Stress**	**Std. hazards**	**Std. Stress**
Mom's work conditions				
Std. Stress	-0.167***	-	-0.124***	-
	(0.030)	-	(0.028)	-
Std. hazards	-	-0.167***	-	-0.124***
	-	(0.030)	-	(0.028)
Work hours/week	-0.001	0.008***	0.004***	0.003*
	(0.002)	(0.002)	(0.002)	(0.002)
Wage/hour in US$	-0.021***	0.016***	0.006*	0.004
	(0.004)	(0.004)	(0.003)	(0.004)
Mom's characteristics				
Age at chidbirth	-0.019***	0.108	-	-
	(0.005)	(0.080)	-	-
Single (=1 if yes)	0.294***	0.042	0.206**	-0.044
	(0.070)	(0.076)	(0.088)	(0.102)
School dropout	0.864***	-0.576***	0.060	-
	(0.115)	(0.126)	(0.249)	-
High school graduate	0.140**	0.063	-0.067	-
	(0.066)	(0.071)	(0.161)	-
College graduate	-0.162**	0.022	-0.055	-
	(0.068)	(0.073)	(0.144)	-
Low Verbal Skills	0.418***	-0.126*	-	-
	(0.061)	(0.067)	-	-
Dad's characteristics				
Age at birth	-0.009***	-0.001	-	-
	(0.002)	(0.002)	-	-
Education (in years)	-0.029***	-0.000	-0.016*	-0.010
	(0.005)	(0.005)	(0.009)	(0.010)
Employment	-0.246***	-0.025	-0.047	-0.006
	(0.065)	(0.070)	(0.096)	(0.111)
Wage/hour in US$	-0.008***	-0.002	-0.009***	0.000
	(0.002)	(0.002)	(0.002)	(0.003)
Family characteristics				
Number of siblings	0.015	0.031	-0.007	0.008
	(0.023)	(0.025)	(0.026)	(0.030)
Savings (=1 if yes)	-0.289***	-0.019	-	-
	(0.061)	(0.067)	-	-
Family Income in US $	-0.186***	.0431	-	-
	(0.031)	(-0.484)	-	-
Grandparents present (=1 if yes)	0.539**	-0.468*	-0.081	-0.142
	(0.264)	(0.283)	(0.167)	(0.193)
Cognitive Support Scale	-0.056***	0.011	-	-

	(0.014)	(0.015)	-	-
No extrafamiliar care (=1 if yes)	0.139*	-0.042	-	-
	(0.077)	(0.083)	-	-
Neighborhood characteristics			-	-
Rural urban code (1= urban, 10 rural)	0.032**	-0.001	-	-
	(0.013)	(0.014)	-	-
Neighborhood (1=safe, 5=unsafe)	0.073**	0.005	-0.011	0.019
	(0.030)	(0.032)	(0.020)	(0.023)
Child's characteristics				
Age in 1997	0.007	0.000	-	-
	(0.009)	(0.010)	-	-
Male	-0.011	-0.013	-	-
	(0.062)	(0.067)	-	-
White	-0.388***	0.002	-	-
	(0.061)	(0.067)	-	-
Black	0.251***	0.117*	-	-
	(0.064)	(0.070)	-	-
Hispanic	0.859***	-0.734***	-	-
	(0.149)	(0.161)	-	-
Low birth weight (=1 if yes)	0.177	-0.281	-	-
	(0.157)	(0.19)	-	-
Bad health at birth (=1 if yes)	0.024	0.021	-	-
	(0.105)	(0.113)	-	-

Table 4: Work conditions and mother-child interactions - total time

	(1)	(2)	(3)	(4)
Panel A: Maternal time in hours/week				
Hours worked/week	-0.0559	-0.0409	-0.0308	-0.145***
	(0.0404)	(0.0427)	(0.0423)	(0.0499)
Log hourly wage	0.0760	0.130	0.116	0.172
	(0.0738)	(0.0832)	(0.0841)	(0.124)
Hazards (std.)	-1.268**	-1.073*	-1.047*	-1.142
	(0.554)	(0.600)	(0.603)	(1.005)
Stress (std.)	-1.509***	-1.684***	-1.680***	-1.182***
	(0.528)	(0.537)	(0.539)	(0.563)
Panel B: Maternal time devoted to developmental activities in hours/week				
Hours worked/week	0.0053	0.0030	0.0034	0.0099
	(0.0214)	(0.0216)	(0.0217)	(0.0192)
Log hourly wage	0.100**	0.0714	0.0694	0.0731
	(0.0392)	(0.0442)	(0.0443)	(0.0550)
Hazards (std.)	-0.3200	-0.1430	-0.1460	-0.4330
	(0.265)	(0.281)	(0.2800)	(0.404)
Stress (std.)	-0.2480	-0.1620	-0.1610	-0.6060
	(0.273)	(0.277)	(0.277)	(0.375)
Panel C: Share of developmental time of maternal-child interactions				
Hours worked/week	0.0002	0.0000	0.0000	0.0002
	(0.0005)	(0.0006)	(0.0005)	(0.0004)
Log hourly wage	0.0021**	0.0007	0.0006	0.0021*
	(0.0009)	(0.0010)	(0.0010)	(0.0011)
Hazards (std.)	-0.0046	0.0002	0.0002	-0.0061
	(0.0070)	(0.0075)	(0.0075)	(0.0093)
Stress (std.)	-0.0014	0.0015	0.0015	-0.0088
	(0.0069)	(0.0071)	(0.0071)	(0.0090)
Specification of the respective columns:				
Child related controls	No	Yes	Yes	Yes
Mom related controls	No	Yes	Yes	Yes
Dad related controls	No	Yes	Yes	Yes
Family related controls	No	Yes	Yes	Yes
Neighborhood related controls	No	Yes	Yes	Yes
Lagged dependent variable	No	No	Yes	No
Individual fixed effect	No	No	No	Yes
Observations	930	930	930	1860

Note: The results in column (1) to (3) stem from OLS regressions, where in column (1) no additional controls are added, in column (2) we add in controls for the characteristics of the child, the mother, the father, the household and the neighborhood. In column (3) we control additionally for the respective lagged dependent variable. Finally column (4) uses a fixed effect regression. All estimations are clustered on the family level.

Table 5: Maternal total time and children's development

	(1)	(2)	(3)	(4)
Letter- Word Score	0.0040**	0.0022	0.0013	0.0027
	(0.0020)	(0.0021)	(0.0018)	(0.0023)
Passage compreh. score	0.0045**	0.00183	0.00114	0.0030
	(0.0021)	(0.00199)	(0.00186)	(0.0025)
Appl. Problem Solving Score	0.0024*	-0.0006	-0.0008	-0.0008
	(0.0014)	(0.0023)	(0.0023)	(0.0016)
Internal. Behavioral Score	-0.0012	-0.0013	-0.0016*	-0.0022**
	(0.0023)	(0.0022)	(0.0009)	(0.0011)
External. Behavioral Score	-0.0028	-0.0027	-0.0030	-0.0025
	(0.0022)	(0.0021)	(0.0018)	(0.0015)
Child related controls	No	Yes	Yes	Yes
Mom related controls	No	Yes	Yes	Yes
Dad related controls	No	Yes	Yes	Yes
Family related controls	No	Yes	Yes	Yes
Neighborhood controls	No	Yes	Yes	Yes
Lagged outcomes	No	No	Yes	No
Individual fixed effect	No	No	No	Yes
Number of observations	930	930	930	1860

Note: The results in column (1) to (3) stem from OLS regressions, where in column (1) no additional controls are added, in column (2) we add in controls for the characteristics of the child, the mother, the father, the household and the neighborhood. In column (3) we control additionally for the respective lagged dependent variable. Finally column (4) uses a fixed effect regression. All estimations are clustered on the family level.

Table 6: Maternal developmental time and children's development

	(1)	(2)	(3)	(4)
Letter- Word Score	0.0176***	0.0129***	0.0103**	0.0083***
	(0.0052)	(0.0049)	(0.0042)	(0.0031)
Passage compreh. score	0.0084*	0.0051	0.0022	0.0046
	(0.0047)	(0.0043)	(0.0040)	(0.0036)
Problem Solving Score	0.0128***	0.0046	0.0037	0.0023
	(0.0046)	(0.004)	(0.0040)	(0.0035)
Internal. Behavior Score	-0.0021	0.0002	-0.0003	-0.0025
	(0.0047)	(0.0049)	(0.0042)	(0.0036)
External. Behavior Score	-0.0093*	-0.0024	-0.0034	-0.0018
	(0.0048)	(0.0046)	(0.0038)	(0.0034)
Child related controls	No	Yes	Yes	Yes
Mom related controls	No	Yes	Yes	Yes
Dad related controls	No	Yes	Yes	Yes
Family related controls	No	Yes	Yes	Yes
Neighborhood controls	No	Yes	Yes	Yes
Lagged outcomes	No	No	Yes	Yes
Individual fixed effect	No	No	No	Yes
Number of observations	930	930	930	1860

Note: The results in column (1) to (3) stem from OLS regressions, where in column (1) no additional controls are added, in column (2) we add in controls for the characteristics of the child, the mother, the father, the household and the neighborhood. In column (3) we control additionally for the respective lagged dependent variable. Finally column (4) uses a fixed effect regression. All estimations are clustered on the family level.