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Material Hardship and Child Socioemotional Behaviors: Differences by Types of Hardship, Timing, and Duration

Afshin Zilanawala[a,*] and **Natasha V. Pilkauskas**[b,c]

[a]Columbia University, 1255 Amsterdam Ave., NYC, NY 10027, USA

[b]Columbia University, 1255 Amsterdam Ave., NYC, NY 10027, USA

Abstract

Child behavior problems are associated with long-term detrimental effects. A large body of literature looks at the association between income and child behavior but few studies examine this association with material hardship, an alternative economic indicator. We use data from the Fragile Families and Child Wellbeing Study to examine the following questions: (a) Is material hardship associated with child socioemotional behavior and are there differences by developmental timing, (b) Are particular hardships (bills, utilities, food, housing, medical) more strongly associated with child behavior, and (c) Are there differences in the association between short-term and long-term material hardship and child behavior? We find that children in households experiencing material hardship score significantly higher on externalizing and internalizing behaviors. Additionally, we find that a mother's inability to pay bills, experience of utility interruption, and housing instability are adversely related to child behavior. We also find that the association between material hardship and child behaviors is stronger at age 5 and that chronic aggregate hardship has a stronger association with child behavior.

Keywords

Material hardship; Child behaviors; Fragile Families

1. Introduction

Concern about the financial welfare of low-income children has been a longstanding issue for policy makers. Substantial empirical evidence has demonstrated that financial hardship is related to adverse health, academic, behavioral, and social outcomes for children (Duncan & Brooks-Gunn, 1997). These results have implications for the intergenerational transmission of poverty as children who grow up in low-income families have poorer academic outcomes and poorer economic prospects. A large body of literature has found an association between economic wellbeing, as measured by income or poverty, and children's socioemotional behavior (Blau,1999; Shea, 2000; Maurin, 2002; Morris & Gennetian, 2003; Taylor, Dearing, & McCartney, 2004; Berger, Paxson, & Waldfogel, 2009). Yet very little research has looked at consumption-based indicators of economic wellbeing and socioemotional

[*]Corresponding author: Telephone: (617) 460-5959; az2124@columbia.edu (A. Zilanawala).
[C]np2247@columbia.edu (N.V. Pilkauskas)

outcomes (excepting Gershoff, Aber, Raver, & Lennon, 2007; Mistry, Vandewater, Huston, & McLoyd, 2002). This article seeks to fill that gap by looking at the association between material hardship (going without basic necessities such as food or shelter) and its relationship to externalizing, internalizing and positive behaviors in young children. We are the first study to look at whether particular types of hardship are more strongly associated with child behavior. Programs that target specific types of material hardship may be able to help diminish the incidence of socioemotional problems in low income families and assist in reducing the transmission of poverty between generations.

In this paper we extend previous research on material hardship and child behavior in several ways. First, we look at five different dimensions of material hardship (inability to pay bills, food insecurity, housing insecurity, medical hardship and having your utilities cut off) to see whether certain types of material hardship are more likely to impact socioemotional adjustment in young children. Prior research has investigated the link between food insecurity and child behavior but no studies have considered other dimensions of hardship. Second, we investigate the timing (age 3 versus age 5) and duration of the experience of material hardship. Studies of income have shown that long-term income deprivation has larger effects on child wellbeing but no studies have looked at differences between sustained or short-term material hardship. Lastly, we use data from the Fragile Families and Child Wellbeing study (FFCWB), a longitudinal study of births in large cities, which oversamples unmarried mothers at the time of birth and follows their children from birth to age 5. These data have several advantages. The oversample of non-marital births provides a large sample of racially and ethnically diverse families, many of whom are economically disadvantaged and who are disproportionately more likely to experience material hardship. The longitudinal nature of the data allows us to employ multiple methodological techniques to better assess the association between material hardship and child socioemotional outcomes. The FFCWB data is unique from other data because of the availability of rich information which allows us to control for confounding variables that may be associated with both the propensity to experience material hardship and child behavior. In addition, studies of income have shown that income deprivation is especially detrimental in early childhood, the time period covered in this study.

Specifically we aim to answer the following questions; (a) Is material hardship associated with child socioemotional behavior and are there differences by developmental timing, (b) Are particular hardships (inability to pay bills, having your utilities cut off, having unmet medical needs, housing insecurity or food hardship/insecurity) more strongly associated with child behavior, and are there differences by child's age, and (c) Are there differences in the association between short-term and long-term material hardship and child behavior?

2. Background and Literature Review

2.1 Background

Child socioemotional behavior is associated with a number of outcomes in adulthood (Duncan & Brooks-Gunn, 1997). Behavior problems can affect children's ability to learn which in turn affects educational and economic outcomes (Claussens, Duncan, & Engel, 2009). Research on child and economic wellbeing has mostly focused on income and poverty measures but in recent years there has been a growing interest in using material hardship as a complementary measure (Beverly, 2001; Lerman, 2002; Ouellette, Burstein, Long, & Beecroft, 2004). Material hardship is a consumption-based indicator of economic wellbeing. Consumption-based indicators of financial wellbeing capture other sources of income besides earnings, such as government transfers, or the ability to draw on social networks, credit cards, or wealth to avoid hardship. Measures of material hardship assess concrete instances of foregone consumption. Income-to-needs ratios do not capture

information about the extent of financial hardship that families face such as inability to buy food or shelter. Research has shown that more than half of families who are between 100 and 200% of poverty experience material hardship, suggesting that hardship is not limited to those below the poverty line (Boushey, Brocht, Gunderson, & Bernstein, 2001). In addition, individuals who are consumption poor are not always the same as those who are income poor and consumption may be a better measure of wellbeing for low-income families (Meyer & Sullivan, 2003, 2007). Income poverty measures do not account for regional differences in the cost of living and thus may be ignoring factors relevant to explaining the material wellbeing of families. Although material hardships mostly stem from limited financial resources, the empirical literature finds only moderate correlation between income poverty and hardship measures (Mayer & Jencks, 1989; Beverly, 1999; Boushey et al., 2001; Sullivan, Turner, & Danziger, 2008). These findings suggest that the relationship between material hardship and child outcomes may not be the same as the relationship between income or poverty and child wellbeing, and is an area worth investigating.

The origin of material hardship measures in the United States date to a study of Chicago residents by Mayer and Jencks (1989). Since then nationally representative datasets have incorporated material hardship measures to their surveys. In particular, the Survey of Income and Program Participation (SIPP) began including measures in 1991 and researchers have utilized the different measures of material hardship found in this data set (Bauman, 1999; Boushey & Gunderson, 2001; Heflin, 2008; Iceland & Bauman, 2007). As research on material hardship has flourished, the construct of material hardship has been operationalized in many ways and there is no consensus on a standard measure of hardship (Ouellette et al., 2004). Researchers using the FFCWB to answer questions pertaining to material hardship have constructed the measure using individual and aggregate indices (Teitler, Reichman, & Nepomnyaschy, 2004; Reichman, Teitler, & Curtis, 2005; Schwartz-Soicher, Geller, & Garfinkel, 2009; Nepomnyaschy & Garfinkel, 2008; Osborne, Berger, & Magnuson, in press). In our study, we hope to gain an understanding of which material hardship dimensions are associated with particular child behaviors. In addition, research focused on hardship measurement by Helfin, Sandberg and Rafail (2009) found that models that disaggregate dimensions of hardship are superior to fully aggregated measures. We follow Heflin and Iceland (2009) by constructing five material hardship domains, as well as including an aggregate indicator of hardship.

2.2 Theoretical framework

We expect that as material hardships increase, behavior problems in children will also increase (and positive behavior will decrease). This hypothesis is supported by two theoretical perspectives found in the literature on the relationship between income and child behavior. The first theoretical framework is one in which a family's economic wellbeing allows parents to purchase goods and services, as well as enriching experiences that are beneficial to children (Becker, 1991). The parent investment model argues that any loss in income or economic stability would likely decrease the ability of parents to purchase these goods that promote child development (Haveman & Wolfe, 1994). For example, child behavior can be influenced by the purchase of lower quality services (such as childcare) and the inability to provide enriching activities. This implies that material hardship is associated with children's behavior by limiting parents' abilities to invest money and/or time in their children. Studies have confirmed the parent investment model as a mediator between income and children's outcomes (Guo & Harris, 2000; Linver, Brooks-Gunn, & Kohen, 2002).

The second theoretical framework focuses on the family and the processes occurring within the family unit and its effect on children. The family stress model suggests that increases in material hardship would likely increase child behavior problems and decrease child positive behavior (Conger & Elder, 1994). Financial hardship or pressure can eclipse parents'

socioemotional resources and disrupt parent-child interactions (Conger et al., 1992; Conger, Conger & Elder, 1997). For example, decreased parental supervision, increased usage of harsh parenting or increased parental depression or anxiety as a result of experiencing material hardships may in turn affect child behavior. The stress manifested from experiencing material hardship can increase marital conflict, which in turn has been shown to predict children's behavior problems (Cummings & Davies, 1999). In support of the family stress model, studies have found mediated links between material hardship, parent stress, and increased behavioral problems (Mistry et al., 2002).

Particular types of hardship may also be more strongly associated with child behavior. We expect that experiencing any of the individual hardships will be associated with an increase in behavior problems (internalizing or externalizing) and a decrease in positive behavior. Hardship may induce responses, such as anxiety, irritability, or acting out, and these influence behaviors. We also expect to see larger associations with externalizing behaviors (rather than internalizing or positive behavior). Our sample consists of young children and they are more likely to demonstrate externalizing behavior patterns than internalizing behaviors (Campbell, Shaw, & Gilliom, 2000). Although a priori we would expect that any of the individual hardships would increase behavior problems and decrease positive behavior, we do expect that certain hardships might be more likely to have larger associations. Hardships that directly affect the child (food hardship, homelessness, and utility interruption) may be more likely to affect child behavior than hardships that are less visible to the child or more indirect (bill hardship or medical hardship that may be managed by the parent).

The duration and developmental timing of the experience of material hardship may have different associations with child behavior. Experiencing a short spell of material hardship is likely to be less detrimental to child behavior than a sustained period or chronic spell of material hardship. Therefore we expect that children who experience hardship in multiple years to be more likely to demonstrate reduced positive behavior and increased externalizing and internalizing behaviors. We also expect that the timing of the experience of hardship is likely to affect child behavior differently. We anticipate that the association between hardship and child behavior at age 3 will be less strong than at age 5. As children age they become more and more aware of their surroundings and therefore we expect that older children would be more adversely affected by hardship than younger children. However, when we consider particular hardships, we believe that differences by age will differ by type of hardship. For example, food hardship is likely to have a similar association with behavior at ages 3 and 5 because the child experiences hunger regardless of their age, whereas the association with difficulty in paying bills is likely to be higher at age 5 when children are more cognizant of their family wellbeing.

2.3 Prior literature

Research on the association between material hardships and child behavior is limited. Gershoff et al. (2007) examined how income and material hardship are associated with child outcomes at age 6. Using a latent construct of material hardship they looked at mediating pathways (parenting quality, stress and investment) between income and material hardship and socioemotional competence. They found that models that included both material hardship and income better explained the mediated association between income and child socioemotional competence than models with income alone. Gershoff et al. did not look at how different types of hardships may have affected child outcomes, nor did they investigate externalizing and internalizing (or positive) behaviors separately. We build on their research by employing different methodological techniques, studying material hardship domains, types of child socioemotional behavior, and long-term measures of hardship. We also investigate differences in developmental timing (toddlerhood versus early school age).

In terms of research that looks at specific types of hardship and its association with child behavior the only domain that has been studied to date is food insecurity. These empirical studies found that children living in food insecure households have more behavioral problems than their food secure counterparts (Alaimo, Olson, & Frongillo, 2001; Kleinman et al., 1998; Huang, Oshima, & Kim, 2010; Ashiabi & O'Neal, 2008; Weinreb et al, 2002; Reid, 2000; Pollitt et al., 1996). Our research extends this literature by examining the association between child socioemotional behavior and four other types of hardships: housing instability, medical hardship, suspension of utilities, and the inability to pay bills.

To our knowledge, the study by Gershoff and colleagues (2007) is the only empirical work to look at the relationship between material hardship and child behavior. However, a large body of related literature demonstrated the association between income and child behavior (Brooks-Gunn & Duncan, 1997; Mayer, 1997; Duncan & Brooks-Gunn, 1997; Blau, 1999; Taylor et al., 2004; Dahl & Lochner, 2005; Huston, McLoyd, & Coll, 1994; Berger et al., 2009). This literature generally found that there are detrimental effects of poverty or low-income on child behavior.

The literature on income and child behavior has also found that the depth and duration of poverty matters. Studies have found that persistent poverty in childhood is associated with child behavior (Duncan, Yeung, Brooks-Gunn, & Smith, 1998) and that permanent income versus current income is more strongly related to child development (Blau, 1999; Brooks-Gunn & Duncan, 1997). Similar differences may exist with the experience of material hardship. This study is the first to examine the experience of long-term material hardship versus short-term hardship.

The timing of the experience of material hardship may have larger or smaller associations with child behavior. Our study investigates early childhood comparing outcomes at age 3 and 5. The literature on income and child behavior has often found larger effects for children in early childhood (Duncan, Brooks-Gunn, & Klebanov, 1994; Duncan & Brooks-Gunn, 1997; Smith, Brooks-Gunn, & Klebanov, 1997; Duncan et al., 1998; Gershoff, Aber, & Raver, 2003) and that the association between income and children's behavior was larger for children in low-income families than for children in more advantaged families (Dearing et al., 2001; Shea, 2000; Maurin, 2002). These findings suggest we may expect to see significant associations between material hardship and child behavior, because our sample consists of children in early childhood who are particularly vulnerable to experiencing material hardship. Additionally, although we do not expect the differences between age 3 and 5 to be large, we investigate whether there are different associations at these two ages.

3. Data and Measures

3.1 Data

We used data from the Fragile Families and Child Well-being Study (FFCWB) to test the hypothesis that material hardship is associated with poor socioemotional adjustment in children. The FFCWB study was representative of births in large US cities (with populations over 200,000) and was designed to oversample non-marital births. Mothers were randomly sampled in 75 hospitals in 20 cities between 1998 and 2000. Interviews were conducted with mothers and fathers at the birth of the child and when the child was 1, 3, and 5 years old (see Reichman, Teitler, Garfinkel, & McLanahan, 2001 for more detailed information about FFCWB study design). The core sample was linked to supplementary data from a collaborative study, the In-Home Longitudinal Study of Pre-School Aged Children (In-Home). The In-Home Study was conducted when the children were about 3-years old and again when they were 5-years old and collected additional in-depth data for a sub-sample of respondents.

The study contained an over-sample of non-marital births. As a result, children in the sample were more likely to live in low income or poor families, to have had absent fathers, and to have had mothers with lower levels of education than children in a nationally representative sample. The data were not representative of the population of families as a whole but provided us with a sample that was very racially diverse and consisted of mainly low-income mothers, a population that is of interest to policymakers and practitioners who are interested in improving the wellbeing of low income families and their children. We included marital and non-marital births at baseline and used city sampling weights for our descriptive table to adjust for the over-sampling of non-marital births.

In generating our analytical sample, we began with the full FFCWB sample of 4,898 observations. We restricted our sample to mothers who had information on material hardship items in years 3 and 5 (N = 4,225 and 4,129 respectively). Of these families, we further restricted to those with observations on the child behavior assessments. The sample varied slightly across the outcomes and different analytic techniques (cross-sectional and longitudinal models). In the 3-year cross-sectional models our sample was 3,223 mothers, and in the 5-year cross-sectional models 2,969 mothers. The sample for the longitudinal analyses (years 3 and 5) was 2,825 mothers as it is restricted to respondents who were interviewed at both the 3-year and 5-year follow up surveys. Mothers in our analytical sample had income to poverty ratios similar to the excluded mothers, but were younger and had higher levels of social support. Excluded mothers were more likely to be Black (59 percent vs. 51 percent) and less likely to be Hispanic (25 percent vs. 31 percent); they were also more likely to be employed at year 1 (54 percent vs. 49 percent) and less likely to have less than a high school degree (37 percent vs. 44 percent).

We used multiple imputation (MI) techniques (Rubin, 1976) to impute missing covariates (but not the material hardship or child behavior measures) although missing values on covariates within the analytic sample were minimal. The fraction of missing on each covariate was 6 percent or less. MI accounts for uncertainty about these missing values by imputing several values for each missing value (with variability due to both sampling error and model uncertainty) (Allison, 2002). We imputed five datasets. Analyses were conducted on each data set and the estimates were averaged to reflect the uncertainty in the missing values and appropriate standard errors. We also ran the analyses using listwise deletion and the results were not substantively altered.

3.2 Outcome variables

We examined externalizing and internalizing child behavior problems and positive behaviors in order to look across behavioral domains. We primarily used mother's reports of child behavior but we also examined teacher's reports of externalizing behavior. The FFCWB study collected items from the Age 2-3 Child Behavior Checklist (CBCL: Achenbach, 1992) that comprise the Anxious/Depressed, Withdrawn and Aggressive subscales of the CBCL at age 3. At age 5, complementary items were collected using the 4-18 CBCL (Achenbach, 1991). To calculate each subscale, responses to each item were summed (0=not true of my child; 1=sometimes/somewhat true; 2=very/often true). Externalizing behavior was assessed using the Aggressive subscale of the CBCL at both time points. This scale includes items such as the child's disobedience, anger, or defiance. Internalizing behavior was measured with two subscales – Anxious/Depressed and Withdrawn behaviors – that ask about a child's sadness, nervousness, affection and interest. The scale scores were normed to have a mean of zero and standard deviation of one. Higher scores reflect more behavior problems. Children's positive behaviors were assessed using the abbreviated Adaptive Social Behavior Inventory (ASBI; Hogan, Scott, & Bauer, 1992) at ages 3 and 5. Items from the Express subscale of the ASBI assess social competence and

prosocial skills with adults and peers. We summed mother's responses and normed the data to have a mean of zero and a standard deviation of 1.

3.3 Material Hardship

We created a composite material hardship measure as well as measures of different types of hardships. Our aggregate material hardship indicator combined information from nine questions to create a dichotomous measure that indicated the presence of 1 or more hardships. Indicators were constructed for both years 3 and 5. The regression models shown below used the dichotomous measure, but we discuss in section 5.2 results from other linear and non-linear specifications of material hardship.

We also created measures of five hardship domains; bills, utility, food, medical, and housing instability. All the material hardship questions were preceded with the following prompt: “We are also interested in some of the problems families face making ends meet. In the past 12 months, did you do any of the following because there wasn't enough money?” Each domain was represented by a dichotomous measure that indicated if the hardship dimension was experienced or not. Respondents were asked if “they did not pay the full amount of rent or mortgage” and if they “did not pay the full amount of a gas, oil, or electricity bill.” If any of these questions was answered in the affirmative, the respondent was coded as having difficulty paying bills. The disruption in utility was indicated when a respondent confirmed that their “telephone service was ever disconnected” or “gas or electricity was turned off.” The food hardship measure included one question: “In the past twelve months, did you receive free food or meals?” Respondents were asked if they “moved in with other people even for a little while because of financial problems”, “stayed in a shelter, in an abandoned building, an automobile or any other place not meant for regular housing, even for one night” and “were evicted from their home or apartment for not paying the rent or mortgage.” If any of these three questions were answered in the affirmative, this indicated the presence of unstable housing. Medical hardship was assessed by the question “Was there anyone in your household who needed to see a doctor or go to the hospital but couldn't because of the cost?”

Lastly, we constructed long-term measures of material hardship. We distinguished between experiencing material hardship for two waves (when the child was 3 and 5 years old) or one wave (either year 3 or year 5). This was constructed for both the aggregate and individual hardships.

3.4 Covariates

We included extensive family background measures including mother, father, and child characteristics. Building of Gershoff et al.'s (2007) work, we included a measure of the household's income-to-needs ratio using official U.S. poverty thresholds established by the Census Bureau, adjusted by family composition and year. Following previous work on material hardship and child behavior our analyses included indicators of mother's race (coded as non-Hispanic white, non-Hispanic black, Hispanic, and other race), education (coded as less than high school, high school, some college and college), immigrant status, and employment status (Mayer & Jencks, 1989; Ouellette et al., 2004; Mirowsky & Ross, 1999). We included indicators of whether father's race and education are different from the mother's, and an indicator for whether the father is 5 or more years older than the mother. We also included a measure of whether the mother lived with both parents at age 15, her health (a binary indicator of excellent, very good, or good versus fair or poor) and her city of residence (city fixed effects).

Research on material hardship has found that marital status is related to hardship (Lerman, 2002). We included indicators for whether the child's parents were married or cohabiting at the baseline interview (with single the excluded category). In order to assess fertility history (with respect to the focal child) we included a set of dummy variables that indicate: both parents' first birth, father had a child with another partner, mother had a child with another partner, or both parents had children with other partners.

Material hardship may be a result of a lack of financial resources; however, it may also be a sign of a mother's inability to plan and organize household expenditures. We included measures of mother's cognitive ability, substance abuse, and of her impulsivity using the abbreviated form of Dickman's (1990) impulsivity scale. This six item scale assesses self control (such as whether the mother often does or says things without considering the consequences) where a higher score indicates more impulsivity. Previous studies have shown that mental health explains much of the variation in material hardship (Sullivan et al., 2008; Heflin & Iceland, 2009). We included an indicator for whether the mother met the criteria for depression and an indicator for whether she had anxiety using the Composite International Diagnostic Interview-Short Form, a standardized tool that assesses respondents' feelings of dysphoria or anhedonia and anxiety (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998). Research has shown that social support is also related to child behavior and material hardship and we included a 6 item index that assesses mother's instrumental support, including ability to borrow money, have a loan cosigned, get babysitting when needed (Lee, Slack, & Lewis, 2004; Ryan, Kalil, & Leininger, 2009). Lastly, with respect to child characteristics, we included the child's gender, age (in months at the one year follow up survey), and low birth weight history.

All control variables were measured at the baseline interview or the year 1 follow up interview in order to ensure that they predate the experience of material hardship and to reduce concerns of endogeneity. Two exceptions were the measures of impulsivity and maternal cognitive score, both of which were assessed in the year 3 follow-up survey but were designed to assess time invariant characteristics.

4. Empirical Strategy

We employed two multivariate models to examine the relationship between children's socioemotional development and mother's material hardship. First we predicted behavioral outcomes from material hardship using an ordinary least squares (OLS) model. We estimated the following equation:

$$Y_i=\beta_0+\beta_1 MH_i+\beta_2 Mom_i+\beta_3 Child_i+\varepsilon_i \quad (1)$$

where Y_{it} denotes the child's score on a particular behavioral outcome at age 3 or 5. MH represents measures of material well-being. We estimated OLS models for each of the three types of hardship constructs: (1) the aggregate dichotomous measure, (2) the five hardship dimensions, and (3) the long-term and short-term constructs. Mom and Child are vectors of family socio-demographic, socio-emotional, and child characteristics, and ε is the disturbance term.

It is important to acknowledge that observed and unobserved maternal characteristics may bias the estimated relationship between maternal material hardship and children's socioemotional behavior. Some mothers may have personal characteristics that protect their children from the household experience of material hardship. These individual characteristics may help mothers manage financial hardship and in turn be associated with positive child behavior. In the extreme case, the association between material hardship and

children's outcomes could be completely explained by the unobserved differences thereby rendering no relationship.

To the extent that observed maternal and child characteristics bias the association between behavioral outcomes and material hardship, the rich battery of covariates afforded to us through the FFCWB data can address the potential for endogeneity. We controlled for observed background, socioeconomic, and personal characteristics, including whether she lived with both parents at age 15, her ability to control her impulsiveness and her cognitive ability. We also controlled for household (or family) structure to distinguish the influence of experiencing material hardship from the extra burden and support that comes with additional family members. In addition, to investigate the association between hardship and child behaviors above and beyond income, we included a control for household income. All covariates predated the measure of material hardship in all models.

Second, in order to address potential selection bias from unobserved characteristics, we estimated residualized change models (National Institute for Child Health and Human Development Early Child Care Research Network & Duncan, 2003) which controlled for earlier measures of each dependent variable to account for unobserved time-invariant maternal and child characteristics. This model, also known as a lagged dependent variable model, leads to an estimation of the impact of material hardship and key sociodemographic variables on the change in child behavior between the two measurement points. This differs from OLS models where hardship coefficients represent mean differences in child behavior by material hardship at one time point. There are two chief virtues of the residualized change model. First, it can provide more power than other change models when the outcomes are highly correlated (Cronbach & Furby, 1970). Second, it can reduce selection bias due to unmeasured child and family characteristics. However, because including an earlier assessment of the outcome as a right hand side variable can induce correlation between it and the error term, we may underestimate coefficients' standard errors. To address this, we used robust standard errors in our estimation process. The residualized change model is represented here:

$$Y_{it}=\beta_0+\beta_1 MH_{i(t-1)}+\beta_2 Mom_{i(t-3)}+\beta_3 Child_{i(t-3)}+\delta_4 CB_{i(t-1)}+\varepsilon_{it} \quad (2)$$

where Y_{it} represents the child behavioral outcome at year 5, t represents the survey wave, and δ_4 represents the analogous earlier assessment at age 3. All maternal and child characteristics in residualized change models predated the experience of material hardship, with the exception of maternal impulsivity and cognitive scores. Although, these latter two covariates are presumed to be time invariant.

5. Results

5.1. Sample Description

Table 1 presents weighted descriptive statistics for all analytic variables by material hardship in Year 3. Forty percent of the sample report experiencing at least one hardship. In terms of the types of hardship, nearly a quarter of mothers report difficulty in paying bills and nearly twenty percent report having utility interruption in the past year. Ten percent experience housing instability and 12% report receiving free food or meals. About 5% of respondents report an unmet medical need.

The sample is racially diverse. About one-third of the mothers are Black (35%), Hispanic mothers represent just under one-third of the sample, and White mothers are nearly one-quarter of the sample. About one-fifth of the mothers in the sample are cohabiting with the

baby's father at the time of birth. As the FFCWB study oversampled unmarried urban births, the sample is relatively disadvantaged. Nearly 30% of mothers have less than a high school degree and another 30% have a high school degree. Just under half of the sample is employed and the mean income-to-needs ratio is 3.

As hypothesized, children whose mothers report any material hardship have significantly higher levels of externalizing and internalizing behaviors, and lower levels of positive behavior. Mothers also differ in terms of family background and personal characteristics by hardship presence. Mothers who experience material hardship are more likely to be Black, to have less than a high school degree, and are significantly less likely to have lived with both parents at age 15. Respondents who have material hardships are more likely to be single at the time of the baby's birth and are more likely to be depressed. Mothers who experience hardship have lower levels of social support and lower income-to-needs ratios (are poorer) than those who do not experience hardship. Lastly, we also test (not shown) the correlation between income-to-needs and hardship and find that it was modest at about −.20.

5.2 Measuring associations between material hardship and children's behavior by developmental timing

Table 2 shows results from OLS regressions of children's socioemotional scores on material hardship at years 3 and 5. Although we report a dichotomous material hardship measure, we ran supplementary analyses (not shown) to examine the linear and non-linear variants of material hardship and its association with child behavior. A continuous measure of material hardship produced similar results to using a dichotomous measure; there was a strong positive association between material hardship and externalizing and internalizing behaviors. A linear hardship measure may disregard important thresholds in the relationship between material hardship and child behavior. Thus, we tested our continuous measure for non-linearities using squared and categorical transformations. We estimated various categories of material hardship, starting with three groups (0, 1, 2+) and increasing to five groups. The coefficients in the non-linear specifications led to inconsistent patterns, had overlapping confidence intervals and large standard errors due to small sample sizes, and did not provide evidence of a non-linear relationship between material hardship and child behavior.

The first three columns show results for material hardship and child behaviors in year 3 and we see that experiencing any hardship in the last year is associated with a .16 standard deviation increase in externalizing behavior and less than a tenth of a standard deviation increase in internalizing behavior. Material hardship is not associated with positive behavior. Columns 4-6 show that material hardship has a larger association in magnitude with child outcomes at age 5. Experiencing any material hardship within the last year is positively and strongly associated with externalizing and internalizing behaviors at year 5. Material hardship is associated with nearly a third of a standard deviation increase in externalizing and internalizing behaviors. Again, we do not find any association between material hardship and positive behavior.

Notably, if we look at the covariates, we find that income-to-needs ratio is not significantly associated with child behavior, with the exception of positive behavior. The positive behavior coefficients are small—nearly zero. Boys score significantly higher on externalizing scales and lower on positive behavior at both waves. A few maternal characteristics are significantly associated with children's behavioral adjustment. Children with mothers in good health have fewer internalizing problems at year 5, while maternal impulsivity is strongly associated with higher externalizing and internalizing scores and lower positive behavior for both developmental time periods. Maternal depression is

significantly associated with increases in externalizing and internalizing scores for children aged 3 and 5.

5.3 Measuring associations between hardship domains and children's behavior by age

Table 3 presents results from models predicting each of the three child outcomes from each of the five material hardship domains. In Panel A, we examine 3 year olds and find that difficulty paying bills and utility interruption are associated with a .15 and .13 standard deviation increase in externalizing behavior, respectively. In contrast to prior work (Kleinman et al., 1998), which found food insufficiency to be associated with behavioral problems among low income children, we find no relationship between free food and levels of externalizing, internalizing, and positive behaviors at age 3. The five hardship domains have no significant associations with either internalizing or positive behaviors.

Panel B examines the association between hardship domains and child behavior at age 5. We find that most of the hardship domains are significantly associated with externalizing and internalizing behaviors for five year olds. Children of mothers who experience difficulty paying bills in the last year have nearly a one-fifth standard deviation increase in externalizing and internalizing behaviors, net of all covariates. Utility interruption is associated with a one-third standard deviation increase in externalizing behavior and a .29 standard deviation increase in internalizing behavior. Housing instability in the last year is associated with nearly a one-fifth standard deviation increase in externalizing and internalizing behaviors. Receiving free food last year is associated with a .17 and a .24 of a standard deviation increase in externalizing and internalizing behaviors, respectively. None of the hardship domains are significantly associated with positive behavior.

5.4 Measuring associations between aggregate and individual hardships experienced at age 3 and children's behavior at age 5

Table 4 presents results predicting child socioemotional outcomes in year 5 as a function of material hardship in year 3. Our findings in the longitudinal analyses are very similar to those in Tables 2 and 3 at age 5. Material hardship is positively and strongly associated with externalizing and internalizing behaviors. Experiencing any hardship is associated with just under a quarter and a one-fifth standard deviation increase in externalizing and internalizing behaviors, respectively.

Within hardship dimensions, we find difficulty paying bills is associated with a quarter and a one-fifth standard deviation increase in externalizing and internalizing behaviors, respectively. Utility interruptions predicts nearly a one-fifth standard deviation increase in externalizing behavior, while housing instability predicts nearly a one-fifth standard deviation increase in externalizing and internalizing behaviors. Food hardship does not predict any child outcomes. Material hardship is not associated with positive behavior.

Despite the rich set of controls included in our OLS models, there is still the possibility of omitted maternal and child characteristics biasing the relationship between material hardship and children's socioemotional outcomes. To address this concern we estimate residualized change (or lagged dependent variable) models where we add the analogous age 3 outcome on the right hand side of the equation. The hardship coefficients are mostly robust to this more stringent estimation. For aggregate hardship, the externalizing coefficient reduces in size but remains statistically significant; the internalizing coefficient is robust to the residualized change specification. The hardship dimensions remain strongly significant with the exception of housing instability which becomes insignificant.

5.5 Measuring associations between long-term and short-term material hardship and children's behavior

Table 5 presents results from predicting child behavior from short-term and long-term exposure to material hardship and individual hardships. We find that experiencing hardship at both ages 3 and 5 has a larger positive association with externalizing and internalizing behaviors (.40 and .38 of a standard deviation, respectively) than experiencing hardship at just one wave (.16 and .22 standard deviation, respectively). In the residualized change models we find similar results. As in previous models, we find no association between positive behavior and material hardship.

In estimating the relationship between one to two waves of hardship dimensions and child outcomes, most of the dimensions are strongly and positively associated with child behavior, with the exception of positive behavior. For difficulty paying bills and housing instability, experiencing hardship at both waves has a greater association with externalizing and internalizing behavior than experiencing hardship at one wave. Although, large confidence intervals preclude rejecting the null hypothesis of differences between long-term and short-term hardship experience. With utility interruption, we find that two waves of this hardship have a larger positive association with externalizing behavior than a short-term experience; these two coefficients are statistically different from each other. Medical hardship is only associated with internalizing behavior if experienced for one wave and one wave of food hardship is associated with both externalizing and internalizing behaviors. Experiencing two waves of either medical or food hardship is not associated with child behavior. A very small proportion of the population experiences two waves of medical hardship (less than 2%) or food hardship (less than 4%), which makes it difficult to yield precise estimates. Additionally, both of these hardship domains rely on information from one question each and this may not have fully captured the occurrence of medical or food hardship. The coefficients remain robust for the most part or reduce in size in residualized change models, with the exception of housing instability and food hardship coefficients for externalizing behavior which become insignificant.

5.6 Extensions

Although we include a rich set of covariates in our models and we examine the association using residualized change models, our findings may still be biased. We were concerned that shared method variance between mother's report of material hardship and children's behavior may have threatened construct validity (Bank, Dishion, Skinner, & Patterson, 1990). For example, a depressed mother may perceive higher levels of material hardship and more behavior problems than a non-depressed mother, which could nullify our significant findings or inflate our associations. Our analyses control for maternal depression and cognitive ability and our findings are robust to these controls. This gave us confidence that our findings are not a result of mother's cognitive or non-cognitive characteristics. In addition, we did a robustness check on maternal reports of child behavior using data for a small subsample of children for whom we have kindergarten teacher's reports on aggressive behavior. We find a positive and significant association between material hardship and teacher reports of aggression suggesting that our findings among mothers are not just an artifact of mother's reporting. Lastly, we examine the relationship between interview ratings of child cooperativeness and child behavior problems. Consistent with prior research, more cooperative children as rated by the interviewer have lower problem behavior scores (for aggressive, withdrawn, and anxious/depressed) (Meadows, McLanahan & Brooks-Gunn, 2007; Geller, Cooper, Garfinkel, Schwartz-Soicher, & Mincy, in press). Taken together these findings gave us confidence in mothers' appraisals of child behavior and reduced our concerns about shared method variance.

We find inconsistent links between food hardship and children's behavioral adjustment, despite empirical work that found associations between food insufficiency and child behavior. However, our measure of food hardship differs substantially from previous studies of food insecurity that use the full Food Security Scale created by the U.S. Department of Agriculture. In order to confirm the previous literature that found an association between food hardship and adverse behavioral outcomes for children, we run additional models (not shown) predicting age 3 and age 5 child outcomes from mother's experience of food hardship using the full 18-item food insecurity scale from the USDA. When we used the full food insecurity scale we find that food hardship is associated with significant increases in externalizing and internalizing behaviors at age 3, and all child behaviors at age 5. The magnitude of our coefficients is similar to recent empirical studies examining the relationship between food hardship and child behavior in early childhood (Slack & Yoo, 2005). We also find associations between food insecurity and externalizing and internalizing behaviors in longitudinal analyses and in our long-term hardship models.

6. Discussion

Our findings contribute to the large body of research that links childhood poverty and financial hardship with adverse child socioemotional outcomes (Duncan & Brooks-Gunn, 1997). There is a long tradition of examining poverty effects using income. However, there is a growing interest in using measures of material hardship to study consumption patterns and basic standard of living (Beverly, 2001), given the critiques of the official poverty measure (Citro & Michael, 1995) and the empirical evidence for the moderate correlation between income poverty and hardship measures (Mayer & Jencks, 1989). Thus, understanding how material hardship relates to child behavior is important.

Our study takes advantage of a recent longitudinal birth cohort study and provides the first evidence on the extent to which types of material hardship are more strongly associated with children's behavioral adjustment and examines these associations by developmental timing and duration of hardship experience. Our findings suggest a link between material hardship and child socioemotional outcomes and build upon previous work by Gershoff et al. (2007) who found significant associations between material hardship and socioemotional competence. Our results indicate material hardship is associated with increases in externalizing and internalizing behaviors, and no associations with positive behavior. These findings lend support to our hypothesis that experiencing material hardship and child behavior are associated and not an artifact of parental and socio-demographic characteristics.

To the extent material hardship measures aspects of family wellbeing above and beyond monetary measures, we consistently find that income is not significant in our models. Prior research has found a moderate correlation between income and material hardship (Mayer & Jencks, 1989), and our findings suggest that material conditions not captured by income are associated with poor child outcomes. Holding income constant, material hardship on the one hand may represent differences in preferences or decision making regarding consumption. On the other hand, hardship may represent poor financial management. The latter hypothesis receives less support in our study, because all our models control for mother's impulsivity. It may be that income is a proxy for meeting the basic standard of living, but families consistently experience a level of deprivation that has a strong association with child behaviors.

Our results provide evidence for the hypothesis that hardship may be more relevant at older ages as five year olds are more aware and responsive to the economic instability in their home environments than three year olds. We find stronger associations for five year olds

than for three year olds. When we examine hardship domains we find that all of the hardship types, with the exception of medical hardship, are significantly associated with externalizing and internalizing behaviors for older children, and the coefficients for five year olds are larger in magnitude to the corresponding ones for 3 year olds. A priori we expected some hardships to influence child outcomes regardless of age, because certain hardships influence a child's environment at age 3 and 5; this pertains to physical needs represented by food, housing, and utility hardship. Our findings only confirm this hypothesis for utility interruption. This may be because only 10% of our sample experience housing or food hardship at age 3 and our ability to detect any associations may be diminished.

When we investigate differences by types of hardship, we find the two most prominent hardships that remain significant in all models predicting externalizing behavior are difficulty paying bills and having utility interruption. At age 5, we find that housing insecurity and food hardship are also related to externalizing behaviors. Additionally, we find that utility interruption, difficulty paying bills, housing insecurity and food hardship are all related to internalizing behaviors but only at age 5. We find a relationship with externalizing behaviors at both ages but internalizing behaviors only at age 5 and this is supported by developmental research that has found evidence of externalizing behavior at preschool ages (and older) while the incidence of internalizing behavior is higher later in development.

In longitudinal analyses, we find similar results to those found in the cross sectional analyses; hardship is positively associated with externalizing and internalizing behaviors and most hardship domains are relevant in predicting child behavior. This suggests that hardship experienced at least 2 years earlier has lingering influence on child behavior, with nearly the same magnitude as hardship experienced concurrently. In residualized change models, a more rigorous strategy to address unobserved heterogeneity; we find our associations to be fairly robust.

In terms of long-term material hardship we find mixed evidence of a long-term versus short-term association. We find an association between long-term hardship and child behavior using the index measure of hardship but not using the individual hardship measures. We find that experiencing material hardship for more than one wave is strongly associated with externalizing and internalizing behaviors, but not with positive behavior. The coefficients on the two measures are statistically different from each other. With respect to domains, difficulty in paying bills, utility interruption, and housing instability have larger coefficients for two waves of experience than one wave but these estimates are not substantively different from each other. More research in this area can help elucidate to what extent a long-term effect exists and if there are differences by types of hardship; in particular, our sample is constrained to examining only two waves of hardship, and this may be too short of a time span to really assess differences in chronic versus short- term hardship.

Our study is not without limitations. We focus on a largely low-income urban population, and thus future research using a nationally representative sample would be helpful to shed further light on the dynamics of families' experience of material hardship. Our findings are also limited to young children. The relationship between hardship and child socioemotional adjustment may differ by child's age and developmental trajectory. In addition, there is some evidence that measures of child behavior at earlier ages tend to overstate aggressive behavior and studies of children during school year ages might show a stronger relationship with internalizing behaviors. Future research should investigate this relationship with older children.

Self-report measures of child behavior may also be subject to inaccuracies. To address concerns of shared method variance we investigate the relationship between material hardship and teacher reports of child behavior (only available for a subsample of children) and find similar results. In addition, we include a large set of covariates that are likely associated with mother's reports of child behavior (such as depression or anxiety), but this may remain an issue. Future research that uses objective assessments of child behavior would be ideal.

Our measures of food and medical hardships did not ask specifically about the focal child's experience of the hardship, but rather about the household more generally. Therefore, it is unclear if the receipt of free food or an unmet medical need related to the focal child or to another household member. This ambiguity may have reduced our ability to detect an association or may have attenuated our coefficients. Additionally, as was discussed earlier, our food hardship measure was represented by a single question, and may not fully capture food hardship. To combat this problem we utilize the full food insecurity scale in supplementary analyses. Medical hardship, unlike food hardship, may be better captured in a single question; however few mothers reported unmet medical needs. This may be due to the unexpected nature of medical hardships (one may or may not have one in a given year) and that individuals who are eligible for Medicaid (like the families in our sample), will sign up for health insurance when a medical need arises, averting medical hardship.

More broadly, as we examine the policy context in which low-income parents are raising children, it is critical to consider how policies can help these families avoid material hardship. Material hardship puts children in low-income families at risk for socioemotional difficulties. Our results suggest there is a potential return to public investments to ameliorate hardship in early childhood for low-income families. Our analyses on hardship domains suggest that programs that help low-income families with cash or in-kind assistance to alleviate the burden of utilities and paying bills may be particularly efficacious. Few government programs target either of these hardships and this may be why we see both a higher incidence of these types of hardships and a stronger relationship with child behavior.

7. Conclusion

Most research and discussion on the economic well-being of low-income families and children's socioemotional adjustment has focused on income or poverty as measures. Despite the fact that the vast majority of this research links early childhood financial hardship with unfavorable socioemotional outcomes, surprisingly little work has examined the role material hardship might play in children's development. In the current study, we find new evidence of substantively important associations between the experience of material hardship and externalizing and internalizing behaviors. Most forms of material hardship are associated with child behaviors, and we find stronger associations for children at age 5 than at age 3. Future research should examine the mechanisms by which hardship affects child outcomes in order to provide valuable information on how to alleviate financial burdens of low-income populations as well as extend this research for school aged children.

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References

Achenbach, TM. Manual for the Child Behavior Checklist/4-18 and 1991 Profile. Burlington: University of Vermont, Department of Psychiatry; 1991.

Achenbach, TM. Manual for the child behavior checklist/2-3 and 1992 profile. Burlington, VT: University of Vermont Department of Psychiatry; 1992.

Alaimo K, Olson C, Frongillo E. Food insufficiency and American school-aged children's cognitive, academic, and psychosocial development. Pediatrics. 2001; 108(1):44–53. [PubMed: 11433053]

Alaimo K, Olson C, Frongillo E, Briefel R. Food insufficiency, family income, and health in US preschool and school-aged children. American Journal of Public Health. 2001; 91(5):781–786. [PubMed: 11344887]

Allison, Paul D. Missing Data. Vol. 136. Thousand Oaks, CA: Sage Publications; 2002.

Ashiabi GS, O'Neal KK. A framework for understanding the association between food insecurity and children's developmental outcomes. Child Development Perspectives. 2008; 2(2):71–77.

Aughinbaugh AA, Gittleman M. Does money matter? A comparison of the effect of income on child development in the United States and Great Britain. Journal of Human Resources. 2003; 38(2):416–440.

Bank, LI.; Dishion, T.; Skinner, M.; Patterson, GR. Method variance in structural equation modeling: Living with “glop”. In: Patterson, GR., editor. Depression and aggression in family interaction. Hillsdale, NJ: Erlbaum; 1990. p. 247-279.

Bauman K. Shifting family definitions: The effect of cohabitation and other non family household relationships on measures of poverty. Demography. 1999; 36(3):315–325. [PubMed: 10472496]

Bauman K. Welfare, work, and material hardship in single parent and other households. Journal of Poverty. 2002; 6(1):21–40.

Becker, GS. A treatise on the family. Cambridge, MA: Harvard University Press; 1991.

Berger L, Paxon C, Waldfogel J. Income and child development. Children and Youth Services Review. 2009; 31(9):978–989. [PubMed: 20368763]

Beverly, S. Economic poverty reconsidered: Material hardship and income-poverty in the United States. Washington University; St. Louis, Missouri: 1999.

Beverly S. Material hardship in the United States: Evidence from the survey of income and program participation. Social Work Research. 2001; 25(3):143.

Blau D. The effect of income on child development. Review of Economics and Statistics. 1999; 81(2): 261–276.

Boushey, H.; Gunderson, B. Briefing paper. Washington, DC: Economic Policy Institute; 2001. When work just isn't enough: Measuring material hardships faced by families after moving from welfare to work.

Boushey, H.; Brocht, C.; Gundersen, B.; Bernstein, J. Hardship in America: The real story of working families. Washington, DC: Economic Policy Institute; 2001.

Brooks-Gunn J, Duncan G. The effects of poverty on children. Future of Children. 1997; 7:55–71. [PubMed: 9299837]

Campbell SB, Shaw DS, Gilliom M. Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. Development and Psychopathology. 2000; 12:467–488. [PubMed: 11014748]

Claussens A, Duncan G, Engel M. Kindergarten skills and fifth-grade achievement: Evidence from the ECLS-K. Economics of Education Review. 2009; 28(4):415–427.

Conger, RD.; Elder, GH, Jr. Families in troubled times: Adapting to change in rural America. Hillsdale, NJ: Aldine; 1994.

Conger, RD.; Conger, KJ.; Elder, GH, Jr. Family economic hardship and adolescent adjustment: Mediating and moderating processes. In: Duncan, GJ.; Brooks-Gunn, J., editors. Consequences of growing up poor. New York: Russell Sage Foundation; 1997. p. 288-310.

Conger RD, Conger KJ, Elder GH Jr, Lorenz FO, Simons RL, Whitbeck LB. A family process model of economic hardship and adjustment of early adolescent boys. Child Development. 1992; 63:526–541. [PubMed: 1600820]

Conger RD, Ge X, Elder GH, Lorenz FO, Simons RL. Economic stress, coercive family process, and developmental problems of adolescents. Child Development. 1994; 65:541–561. [PubMed: 8013239]

Costello EJ, Compton SN, Keeler G, Angold A. Relationships between poverty and psychopathology: A natural experiment. Journal of the American Medical Association. 2003; 290:2023–2029. [PubMed: 14559956]

Citro, C.; Michael, R. Measuring poverty: A new approach. Washington, DC: National Academy Press; 1995.

Cook JT, Frank DA, Berkowitz C, Black MM, Casey PH, Cutts DB, Nord M, et al. Food insecurity is associated with adverse health outcomes among human infants and toddlers. Journal of Nutrition. 2004; 134(6):1432–1438. [PubMed: 15173408]

Cronbach LJ, Furby L. How should we measure “change”? — Or should we? Psychological Bulletin. 1970; 74:68–80.

Cummings, EM.; Davies, PT. Depressed parents and family functioning: Interpersonal effects and children's functioning and development. In: Joiner, T.; Coyne, JC., editors. Advances in interpersonal approaches: The interactional nature of depression. Washington, DC: American Psychological Association; 1999. p. 299-327.

Dahl G, Lochner L. The impact of family income on child achievement. National Bureau of Economic Research Working Paper 11279. 2005

Dearing E, McCartney K, Taylor B. Change in family income-to-needs matters more for children with less. Child Development. 2001; 72(6):1779–1793. [PubMed: 11768145]

Dickman SJ. Functional and dysfunctional impulsivity: Personality and cognitive correlates. Journal of Personality and Social Psychology. 1990; 58(1):95–102. [PubMed: 2308076]

Duncan, G.; Brooks-Gunn, J., editors. Consequences of growing up poor. New York: Russell Sage; 1997.

Duncan GJ, Brooks-Gunn J, Klebanov PK. Economic deprivation and early childhood development. Child Development. 1994; 65:296–318. [PubMed: 7516849]

Duncan GJ, Yeung WJ, Brooks-Gunn J, Smith JR. How much does childhood poverty affect the life chances of children? American Sociological Review. 1998; 63:406–423.

Geller A, Cooper C, Garfinkel I, Schwartz-Soicher O, Mincy R. Beyond absenteeism: Father incarceration and child development. Demography. in press.

Gershoff, ET.; Aber, JL.; Raver, CC. Child poverty in the United States: An evidence-based conceptual framework for programs and policies. In: Jacobs, F.; Wertlieb, D.; Lerner, RM., editors. Handbook of applied developmental science: Promoting positive child, adolescent, and family development through research, policies, and programs. Vol. 2. Thousand Oaks, CA: Sage; 2003. p. 81-136.

Gershoff ET, Aber JL, Raver CC, Lennon MC. Income is not enough: Incorporating material hardship into models of income associations with parenting and child development. Child Development. 2007; 78(1):70–95. [PubMed: 17328694]

Guo G, Harris KM. The mechanisms mediating the effects of poverty on children's intellectual development. Demography. 2000; 37:431–447. [PubMed: 11086569]

Haveman, R.; Wolfe, B. Succeeding generations:On the effects of investments in children. New York: Russell Sage; 1994.

Haveman R, Wolfe B. The determinants of children's attainments: A review of methods and findings. Journal of Economic Literature. 1995; 33(4):1829–1878.

Heflin CM. Dynamics of material hardship in the women's employment study. Social Service Review. 2006; 80(3):377–397.

Heflin, CM. State variation in material hardship among households with children. Presented at the Annual Meeting of the Population Association of America; New Orleans, LA. 2008.

Heflin CM, Iceland J. Poverty, hardship and depression. Social Science Quarterly. 2009; 90(5):1051–1071.

Heflin CM, Sandberg J, Rafail P. The structure of material hardship in US households: An examination of the coherence behind common measures of well-being. Social problems. 2009; 56(4):746–764.

Hogan AE, Scott KG, Bauer CR. The adaptive social behavior inventory (ASBI): A new assessment of social competence in high-risk five-year-olds. Journal of Psychoeducational Assessment. 1992; 10:230–239.

Huang J, Oshima K, Kim Y. Does food insecurity affect parental characteristics and child behavior? Testing mediation effects. Social Service Review. 2010; 84(3):381–401. [PubMed: 20873019]

Huston AC, McLoyd VC, Coll CG. Children and poverty: Issues in contemporary research. Child Development. 1994; 65(2):275–282. [PubMed: 7516847]

Iceland J, Bauman KJ. Income poverty and material hardship: How strong is the association? The Journal of Socio-Economics. 2007; 36:376–396.

Kalil A, Seefeldt K, Wang H. Sanctions and material hardship under TANF. Social Services Review. 2002; 76(4):642–662.

Kessler RC, Andrews G, Mroczek D, Ustun TB, Wittchen HU. The world health organization composite international diagnostic interview short form (CIDI-SF). International Journal of Methods in Psychiatric Research. 1998; 7(4):171–185.

Kleinman RE, Murphy JM, Little M, Pagano M, Wehler CA, Regal K, Jellinek MS. Hunger in children in the United States: Potential behavioral and emotional correlates. Pediatrics. 1998; 101(1):e3. [PubMed: 9417167]

Korenman S, Miller J, Sjaastad J. Long-term poverty and child development in the United States: Results from the NLSY. Children and Youth Services Review. 1995; 17:127–155.

Lee BJ, Slack KS, Lewis DA. Are welfare sanctions working as intended? Welfare receipt, work activity, and material hardship among TANF-recipient families. Social Service Review. 2004; 78(3):370.

Lerman R. How do marriage, cohabitation, and single parenthood affect the material hardships of Families with Children? Urban Institute and American University. 2002

Linver MR, Brooks-Gunn J, Kohen DE. Family processes as pathways from income to young children's development. Developmental Psychology. 2002; 38:719–734. [PubMed: 12220050]

Maurin E. The impact of parental income on early schooling transitions: A reexamination using data over three generations. Journal of Public Economics. 2002; 85:301–332.

Mayer, S. What money can't buy: The effect of parental income on children's outcomes. Cambridge: Harvard University Press; 1997.

Mayer S, Jencks C. Poverty and the distribution of material mardship. The Journal of Human Resources. 1989; 24(1):88–114.

Meadows SO, McLanahan SS, Brooks-Gunn J. Parental depression and anxiety and early childhood behavior problems across family types. Journal of Marriage and Family. 2007; 69:1162–1177.

Meyer BD, Sullivan JX. Measuring the well-being of the poor using income and consumption. Journal of Human Resources. 2003; 38:S:1180–1220.

Meyer BD, Sullivan JX. Further Results on Measuring the Well-Being of the Poor Using Income and Consumption. National Bureau of Economic Research Working Paper 13413. 2007

Mirowsky J, Ross CE. Economic hardship across the life course. American Sociological Review. 1999; 64:577–584.

Mistry RS, Vandewater EA, Huston AC, McLoyd VC. Economic well-being and children's social adjustment: The role of family processes in an ethnically diverse low-income sample. Child Development. 2002; 73:935–951. [PubMed: 12038561]

Morris PA, Duncan GJ, Clark-Kauffman E. Child well-being in an era of welfare reform: The sensitivity of transitions in development to policy change. Developmental Psychology. 2005; 41:919–932. [PubMed: 16351337]

Morris PA, Duncan GJ, Rodrigues C. Using welfare reform experiments to estimate the impact of income on child achievement. Northwestern University Working Paper. 2004

Morris PA, Gennetian LA. Identifying the effects of income on children's development using experimental data. Journal of Marriage and Family. 2003; 65:716–729.

NICHD Early Child Care Research Network. Trajectories of physical aggression from toddlerhood to middle childhood. Monographs of the Society for Research in Child Development. 2004; 69:vii–129.

Duncan G. National Institute of Child Health and Human Development Early Child Care Research Network. Modeling the impacts of child care quality on children's preschool cognitive development. Child Development. 2003; 74:1454–1475. [PubMed: 14552408]

Nepomnyaschy L, Garfinkel I. Fathers' involvement with their nonresident children and material hardship. Social Service Review. 2011; 85(1):3–38. [PubMed: 21822335]

Osborne C, Berger L, Magnuson K. Family structure transitions and changes in maternal depression and parenting. Demography. in press.

Ouellette, T.; Burstein, N.; Long, D.; Beecroft, E. Measures of material hardship: Final report. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, Office of the Secretary, U. S. Department of Health and Human Services; 2004.

Pollitt E, Golub M, Gorman K, Grantham-McGregor S, Levitsky D, Schürch B, et al. Wachs T. A reconceptualization of undernutrition on children's biological, psychosocial, and behavioral development. Society for Research in Child Development Social Policy Report. 1996; 10(5):1–22.

Rector R, Johnson K, Youssef SE. The extent of material hardship and poverty in the United States. Review of Social Economy. 1999; 57(3):351–358.

Reichman N, Teitler J, Curtis M. TANF sanctioning and hardship. Social Service Review. 2005; 79(2): 215–236.

Reichman N, Teitler J, Garfinkel I, McLanahan S. Fragile families: Sample and design. Children and Youth Services Review. 2001; 23:303–326.

Reid LL. The consequences of food insecurity for child well-being: An analysis of children's school achievement, psychological well-being, and health. Joint Center for Poverty Research Working Paper 137. 2000

Rubin D. Inference and missing data. Biometrika. 1976; 63:581–592.

Ryan R, Kalil A, Leininger L. Low-income mothers' private safety nets and children's socioemotional well-being. Journal of Marriage and Family. 2009; 71:278–297.

Schwartz-Soicher O, Geller A, Garfinkel I. The effect of parental incarceration on material hardship. Social Service Review. 2011; 85(3):447–473.

Shea J. Does parents' money matter? Journal of Public Economics. 2000; 77(2):155–184.

Short K. Material and financial hardship and income-based poverty measures in the USA. Journal of Social Policy. 2005; 34(1):21–38.

Smith, J.; Brooks-Gunn, J.; Klebanov, P. Consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In: Duncan, GJ.; Brooks-Gunn, J., editors. Consequences of growing up poor. New York: Russell Sage Foundation; 1997. p. 132-189.

Sullivan JX, Turner L, Danziger S. The relationship between income and material hardship. Journal of Policy Analysis and Management. 2008; 27(1):63–81.

Taylor B, Dearing E, McCartney K. Incomes and outcomes in early childhood. Journal of Human Resources. 2004; 34(4):980–1007.

Teitler JO, Reichman N, Nepomnyaschy L. Sources of support, child care, and hardship among unwed mothers, 1999-2001. Social Service Review. 2004; 78(1):125–148.

Weinreb L, Goldberg R, Bassuk E, Perloff J. Determinants of health and service use patterns in homeless and low-income housed children. Pediatrics. 1998; 102:554–562. [PubMed: 9738176]

Weinreb L, Wehler C, Perloff J, Scott R, Hosmer D, Sagor L, Gunderson C. Hunger: Its impact on children's health and mental health. Pediatrics. 2002; 110:41–50.

Whitaker RC, Phillips SM, Orzol SM. Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children. Pediatrics. 2006; 118:859–868.

Yeung WJ, Linver MR, Brooks-Gunn J. How money matters for young children's development: Parental investment and family processes. Child Development. 2002; 73(6):1861–1879. [PubMed: 12487499]

Highlights

We examine how material hardship is associated with child behaviors.

Material hardship increases externalizing and internalizing behaviors.

We find stronger associations for five year olds than for three year olds.

Most hardship domains are associated with externalizing and internalizing behaviors.

Bills and utility hardships are consistently associated with externalizing behavior.

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Table 1

Sample Descriptives (Means and Frequencies) by Material Hardship (N=3,223)

	Overall		Hardship at Year 3		No Hardship at Year 3	
	***M* or %**	**(SD)**	***M* or %**	**(SD)**	***M* or %**	**(SD)**
Any Material Hardship	40.1		-		-	
Difficulty Paying Bills	23.8		-		-	
Utilities Shut Off	19.2		-		-	
Housing Instability	10.3		-		-	
Food Hardship	11.8		-		-	
Medical Hardship	4.8		-		-	
Child Behavior at 5-Year Survey						
Externalizing behavior (mean, range = 0-38)	12.63	(6.23)	13.89***	(6.50)	11.61	(5.76)
Internalizing behavior (mean, range = 0-26)	5.32	(4.26)	5.99***	(4.57)	4.76	(3.90)
Positive behavior (mean, range = 0-18)	15.58	(2.65)	15.47***	(2.73)	15.67	(2.58)
Child Behavior at 3-Year Survey						
Externalizing behavior (mean, range = 0-30)	9.68	(5.86)	10.67***	(5.94)	8.80	(5.65)
Internalizing behavior (mean, range = 0-36)	8.18	(5.71)	8.99***	(6.04)	7.46	(5.29)
Positive behavior (mean, range = 0-18)	15.41	(2.62)	15.36*	(2.69)	15.45	(2.56)
Income-to-needs ratio (mean)	3.00	(2.39)	1.69***	(1.54)	3.99	(2.84)
Age						
Mother at baby's birth (in years)	27.25	(6.06)	25.51**	(5.6)	28.22	(6.36)
Father more than 5 years older than mother	27.5		22.4**		34.3	
Child's age at first follow-up (in months)	13.94	(3.41)	13.73	(3.4)	14.12	(3.40)
Mothers' race/ethnicity						
White non-Hispanic	27.7		16.9**		38.1	
Black non-Hispanic	35.4		50.1***		26.4	
Hispanic	30.8		29.9		29.0	
Other non-Hispanic	6.1		3.1		6.5	
Parents are of different race/ethnicity	13.1		14.4		12.3	

	Overall		Hardship at Year 3		No Hardship at Year 3	
	M or %	(SD)	*M* or %	(SD)	*M* or %	(SD)
Mother lived with both parents at age 15	52.2		38.2*		57.6	
Mother's education						
Less than high school	28.3		32.1***		26.0	
High school degree	31.7		34.1		29.6	
Some college	21.4		28.3*		15.4	
Bachelor's degree or higher	18.6		5.5***		29.0	
Father's education is greater than the mother's	22.3		19.5		25.6	
Relationship with child's father						
Married	50.2		34.4*		59.7	
Cohabiting	21.7		28.7		18.6	
Single	28.1		36.9*		21.7	
Multi-partner fertility						
Neither has children with other partners	59.4		44.8***		69.7	
Father has children with other partners	16.0		21.8*		12.4	
Mother has children with other partners	10.4		13.9		7.5	
Both have children with other partners	14.2		19.5		10.4	
Child is a boy	55.4		56.4		57.3	
Baby was born low birth weight	7.7		8.8		9.0	
Mother's health is excellent, very good, or good	92.8		90.5		93.8	
Mother has a substance abuse problem	2.0		3.0		1.2	
Mother has depression [a]	11.5		17.5*		7.1	
Mother has anxiety [b]	3.3		6.5		1.0	
Mother's impulsivity (mean, range=1-4) [c]†	1.95	(.62)	2.07	(.63)	1.92	(.60)
Mother's cognitive score (mean, range=0-15) [d]†	6.92	(2.66)	6.91	(2.61)	7.08	(2.71)
Mother's social support (mean, range=0-6) [e]	3.99	(1.96)	3.42**	(1.95)	4.48	(1.87)
Mother is employed	46.8		46.9		50.3	
Mother is an immigrant	24.3		20.5		22.7	
Primary language is Spanish	15.7		16.3		11.6	

	Overall		Hardship at Year 3		No Hardship at Year 3	
	***M* or %**	**(SD)**	***M* or %**	**(SD)**	***M* or %**	**(SD)**
N	3,233		1,522		1,701	

Note: Variables are from the baseline (just after the baby's birth) or 1-year survey unless noted with a (†) indicating measures that were assessed at the 3-year survey. Percentages and means are weighted. Number of observations are unweighted.

*** $p<0.001$;

** $p<0.01$;

* $p<0.05$; for *t*-statistics testing mean differences between experiencing any hardship and no hardship.

[a] From the Composite International Diagnostic Interview-Short Form. Indicates whether respondent meets the conservative criteria for depressive symptoms.

[b] From the Composite International Diagnostic Interview-Short Form. Indicates whether respondent meets the criteria for generalized anxiety disorder.

[c] From Dickman's Impulsivity Scale.

[d] From the Weschler Adult Intelligence Scale - Revised (WAIS-R).

[e] Index of 6 questions on social support.

Table 2

Cross-Sectional Ordinary Least Squares Regressions of Material Hardship and Child Behaviors at Age 3 and Age 5

	Year 3			Year 5		
	Externalizing (1)	**Internalizing (2)**	**Positive Behavior (3)**	**Externalizing (4)**	**Year 5 Internalizing (5)**	**Positive Behavior (6)**
Material hardship	0.16***	0.08*	0.06	0.31***	0.30***	−0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Income-to-needs ratio	0.00	−0.01	0.02*	−0.00	−0.01	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Mother's age	−0.01*	−0.00	−0.00	−0.01*	−0.00	−0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Father 5 + years older than mother	−0.04 (0.04)	−0.02 (0.04)	0.00 (0.04)	−0.10* (0.04)	−0.07 (0.04)	−0.02 (0.04)
Child's age	−0.01 (0.01)	−0.00 (0.01)	0.00 (0.01)	−0.01 (0.01)	0.00 (0.01)	−0.01 (0.01)
White non-Hispanic	−0.00 (0.05)	0.02 (0.05)	0.07 (0.06)	0.12* (0.06)	0.14* (0.06)	0.02 (0.06)
Hispanic	0.08 (0.06)	0.10 (0.06)	−0.06 (0.07)	0.06 (0.07)	0.19** (0.07)	−0.06 (0.06)
Other non-Hispanic	0.21 (0.12)	0.22 (0.13)	−0.15 (0.11)	0.25* (0.12)	0.26* (0.13)	−0.05 (0.11)
Parents are of different race/ethnicity	−0.02 (0.05)	−0.04 (0.05)	0.14** (0.05)	−0.03 (0.06)	−0.08 (0.05)	0.09 (0.05)
Mother lived with both parents at age 15	−0.01 (0.04)	0.01 (0.04)	−0.03 (0.04)	0.00 (0.04)	−0.02 (0.04)	−0.05 (0.04)
High school degree	−0.04 (0.05)	−0.15** (0.05)	0.13* (0.05)	−0.07 (0.05)	−0.01 (0.05)	0.02 (0.05)
Some college	−0.15** (0.05)	−0.35*** (0.06)	0.26*** (0.06)	−0.13* (0.06)	−0.17** (0.06)	0.13* (0.06)
Bachelor's degree or higher	−0.11 (0.08)	−0.36*** (0.09)	0.17 (0.09)	−0.21* (0.09)	0.05 (0.09)	−0.03 (0.09)
Father's education is greater than the mother's	−0.05 (0.04)	−0.07 (0.05)	−0.03 (0.05)	−0.06 (0.05)	−0.01 (0.05)	0.01 (0.04)
Married	−0.10 (0.05)	−0.12* (0.06)	0.06 (0.06)	−0.10 (0.06)	−0.15* (0.06)	0.06 (0.06)
Cohabiting	−0.03 (0.04)	−0.07 (0.04)	0.06 (0.05)	−0.12** (0.04)	−0.04 (0.04)	0.04 (0.04)
Father has children with other partners	0.09 (0.05)	0.06 (0.05)	0.08 (0.06)	0.07 (0.06)	0.04 (0.05)	0.02 (0.05)
Mother has children with other partners	0.05 (0.05)	0.01 (0.06)	−0.02 (0.06)	0.12* (0.06)	−0.05 (0.06)	−0.07 (0.06)
Both have children with other partners	0.12* (0.06)	−0.01 (0.06)	0.04 (0.06)	0.18** (0.06)	0.04 (0.06)	−0.02 (0.06)
Child is a boy	0.10** (0.03)	0.09* (0.04)	−0.13*** (0.04)	0.10** (0.04)	0.03 (0.04)	−0.15*** (0.03)
Baby was born low birth weight	0.02 (0.06)	0.06 (0.06)	−0.04 (0.07)	0.10 (0.07)	−0.03 (0.06)	−0.08 (0.06)

	Year 3			Year 5		
	Externalizing (1)	**Internalizing (2)**	**Positive Behavior (3)**	**Externalizing (4)**	**Year 5 Internalizing (5)**	**Positive Behavior (6)**
Mother's good health	−0.14 (0.07)	−0.11 (0.08)	0.08 (0.08)	−0.12 (0.08)	−0.26** (0.09)	0.08 (0.07)
Mother has a substance abuse problem	−0.08 (0.09)	−0.11 (0.09)	−0.02 (0.09)	−0.03 (0.09)	0.05 (0.09)	−0.06 (0.09)
Mother has depression	0.20*** (0.06)	0.15* (0.06)	0.08 (0.06)	0.20** (0.06)	0.17* (0.06)	0.09 (0.06)
Mother has anxiety	0.09 (0.12)	0.02 (0.13)	0.07 (0.10)	0.10 (0.13)	0.27 (0.14)	0.15 (0.10)
Mother's impulsivity	0.30*** (0.03)	0.33*** (0.03)	−0.11*** (0.03)	0.23*** (0.03)	0.18*** (0.03)	−0.14*** (0.03)
Mother's cognitive score	0.00 (0.01)	−0.03*** (0.01)	0.03*** (0.01)	0.01 (0.01)	−0.02** (0.01)	0.03*** (0.01)
Mother's social support	−0.03* (0.01)	−0.05*** (0.01)	0.04** (0.01)	−0.01 (0.01)	−0.01 (0.01)	0.04*** (0.01)
Mother is employed	0.00 (0.04)	−0.04 (0.04)	0.06 (0.04)	−0.03 (0.04)	−0.03 (0.04)	0.03 (0.04)
Mother is an immigrant	−0.10 (0.07)	0.05 (0.07)	−0.03 (0.08)	0.05 (0.08)	0.07 (0.08)	−0.20* (0.08)
Primary language is Spanish	−0.17 (0.09)	−0.12 (0.11)	−0.12 (0.11)	−0.26** (0.10)	0.10 (0.12)	−0.20 (0.12)
Constant	−0.13 (0.21)	−0.10 (0.22)	−0.64** (0.23)	−0.19 (0.22)	−0.11 (0.23)	0.09 (0.24)
Observations	3,223	2,763	2,830	2,713	2,720	2,969

Note: Robust standard errors in parentheses. Models include city fixed effects not shown here.

*** $p<0.001$;

** $p<0.01$;

* $p<0.05$

Table 3

OLS Regressions of Material Hardship Dimensions and Child Behaviors - Cross Sectional Analyses

	Externalizing		Internalizing		Positive behavior	
	β	SE	β	SE	β	SE
Panel A: Year 3						
Difficulty Paying Bills	0.15**	(.05)	0.04	(.05)	0.09	(.05)
Utilities Shut Off	0.13*	(.05)	0.04	(.05)	0.03	(.05)
Housing Instability	0.14	(.07)	0.15	(.08)	0.03	(.08)
Medical Hardship	0.02	(.08)	0.01	(.09)	−0.06	(.10)
Food Hardship	0.13	(.07)	0.04	(.08)	0.06	(.07)
N	2,363		2,049		2,100	
Panel B: Year 5						
Difficulty Paying Bills	0.20***	(.04)	0.22***	(.04)	−0.04	(.04)
Utilities Shut Off	0.32***	(.05)	0.29***	(.05)	0.06	(.04)
Housing Instability	0.22***	(.07)	0.19**	(.06)	0.09	(.06)
Medical Hardship	0.18	(.09)	0.19	(.10)	−0.01	(.09)
Food Hardship	0.17*	(.07)	0.24**	(.07)	−0.12	(.07)
N	2,708		2,715		2,963	

Note: Not shown here, the models include controls for income-to-needs, age, race, mother lived with both parents at age 15, education, relationship status, multiple partner fertility, child gender, child low birth weight, mother mental and physical health, substance abuse, impulsivity, mother cognitive ability, social support, and city of residence.

*** $p<0.001$;

** $p<0.01$;

* $p<0.05$

Table 4

Longitudinal OLS and Residualized Change Regressions Predicting Age 5 Child Outcomes From Material Hardships at Age 3

	Externalizing				Internalizing				Positive Behavior			
	OLS		RC		OLS		RC		OLS		RC	
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE
Material Hardship Index Dimensions	0.23***	0.04	0.14***	0.04	0.21***	0.04	0.21***	0.04	-0.04	0.04	-0.01	0.04
Difficulty Paying Bills	0.24***	0.05	0.16**	0.05	0.20***	0.05	0.20***	0.05	-0.02	0.05	-0.01	0.05
Utilities Shut Off	0.21***	0.06	0.16**	0.05	0.10	0.06	0.09	0.06	-0.05	0.05	-0.07	0.06
Housing Instability	0.19*	0.08	0.10	0.07	0.23**	0.08	0.22**	0.08	0.03	0.07	0.05	0.07
Medical Hardship	−0.05	0.08	−0.05	0.09	0.07	0.09	0.14	0.10	0.08	0.08	0.17	0.09
Food Hardship	0.16	0.08	0.09	0.08	0.15	0.09	0.14	0.09	-0.02	0.07	0.01	0.08

Note: Not shown here, the models include controls for income-to-needs, age, race, mother lived with both parents at age 15, education, relationship status, multiple partner fertility, child gender, child low birth weight, mother mental and physical health, substance abuse, impulsivity, mother cognitive ability, social support, and city of residence. The residualized change models also include children's scores on earlier measures of the outcome in the model not shown here.

*** $p<0.001$;

** $p<0.01$;

* $p<0.05$

Table 5

OLS and Residualized Change Regressions of Long-term Material Hardship and Child Behavior

	Externalizing				Internalizing				Positive Behavior			
	OLS		RC		OLS		RC		OLS		RC	
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE
Material Hardship Index												
One Wave	0.16**	0.05	0.12*	0.05	0.22***	0.05	0.25***	0.05	−0.03	0.05	−0.02	0.05
Two Waves	0.40***	0.05	0.29***	0.05	0.38***	0.05	0.37***	0.05	−0.03	0.05	−0.04	0.05
Dimensions												
Difficulty Paying Bills												
One Wave	0.20***	0.06	0.16**	0.05	0.20***	0.06	0.18**	0.06	−0.04	0.05	−0.01	0.05
Two Waves	0.30***	0.07	0.21**	0.06	0.30***	0.06	0.29***	0.06	−0.04	0.06	−0.07	0.06
Utilities Shut Off												
One Wave	0.20***	0.06	0.11*	0.05	0.24***	0.06	0.18**	0.06	−0.05	0.05	−0.10	0.06
Two Waves	0.40***	0.08	0.28***	0.08	0.15	0.08	0.13	0.08	0.07	0.07	0.01	0.07
Housing Instability												
One Wave	0.17*	0.07	0.12	0.07	0.19**	0.07	0.16*	0.07	0.02	0.06	0.02	0.06
Two Waves	0.36**	0.12	0.25	0.13	0.33*	0.13	0.35*	0.14	0.17	0.11	0.09	0.12
Medical Hardship												
One Wave	0.03	0.09	0.04	0.09	0.20*	0.09	0.23*	0.10	0.06	0.07	0.08	0.08
Two Waves	0.04	0.18	0.08	0.22	−0.10	0.18	−0.05	0.19	0.07	0.20	0.18	0.21
Food Hardship												
One Wave	0.24**	0.07	0.14	0.07	0.25**	0.08	0.21**	0.08	−0.02	0.07	0.00	0.07
Two Waves	0.15	0.13	0.10	0.12	0.20	0.14	0.20	0.15	−0.16	0.12	−0.11	0.13

Note: Not shown here, the models include controls for income-to-needs, age, race, mother lived with both parents at age 15, education, relationship status, multiple partner fertility, child gender, child low birth weight, mother mental and physical health, substance abuse, impulsivity, mother cognitive ability, social support, and city of residence. The residualized change models also include children's scores on earlier measures of the outcome in the model not shown here.

*** $p<0.001$;

** $p<0.01$;

* $p<0.05$