The Fragile Families and Child Wellbeing Study changed its name to The Future of Families and Child Wellbeing Study (FFCWS). Due to the issue date of this document, FFCWS will be referenced by its former name. Any further reference to FFCWS should kindly observe this name change.

Low-Income Mothers' Material Hardship and Children's Socioemotional WellBeing

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Abstract

Research suggests that children from low-income families are more likely to exhibit behavioral problems than children from wealthier families and these adverse behaviors have long-term detrimental effects on academic outcomes, health and earnings. In this paper, we examine the relationship between material hardship, an economic indicator that describes concrete adversities, and child behavior. Specifically, 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, (b) Are particular hardships associated with socioemotional outcomes, and (c) Are there stronger effects for more recent or long lasting hardships? We find that children in households experiencing material hardship score significantly higher on aggressive, withdrawn, and anxious/depressed behaviors. Additionally, we find that a mother's inability to pay bills, having utilities cut off, and having unmet medical needs have particular adverse affects on child behavior.

Concern about the financial welfare of low-income children has been a longstanding issue for policy makers. Substantial empirical evidence demonstrates that financial hardship is related to adverse health, academic, behavioral, and social outcomes for children (Duncan and 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. Research on economic wellbeing and children's socioemotional outcomes has generally focused on measures of income and poverty and finds a relationship (e.g. Blau 1999, Shea 2000, Maurin 2002, Morris and Gennetian 2003, Taylor, Dearing, and McCartney 2004, Berger, Paxson, and Waldfogel 2009). Only one study has investigated the relationship between material hardship (going without basic necessities such as food or shelter) and child socioemotional behaviors (Gershoff, Aber, Raver and Lennon 2007). Although this study suggests that material hardship would affect child socioemotional development, more research is needed to understand whether hardship is detrimental to child behavior and if there are specific types of hardship that are particularly harmful. Programs that target 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 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 mothers who are racially and ethnically diverse and economically disadvantaged families, who are disproportionately more likely to experience material hardship. The longitudinal nature of the data allow us to employ

rigorous methods (individual fixed effects and lagged dependent variable modeling) to better assess any causal relationships between material hardship and child socioemotional behavior than previous studies. 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 affect both the propensity to experience material hardship and child behavior. Second, 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. Third, we consider the role that the experience of long term material hardship plays on child behavior.

Specifically we aim to answer the following questions; (a) Is the experience of material hardship at age 3 associated with child socioemotional behavior at age 5, (b) Are particular hardships (inability to pay bills, having your utilities cut off, having unmet medical needs, housing insecurity or food insecurity) associated with socioemotional outcomes, and (c) Are there stronger effects for more recent or long lasting hardships?

Background and Literature

Child socioemotional behavior is associated with a number of poor outcomes in adulthood (Duncan and Brooks-Gunn 1997). Behavior problems can affect children's ability to learn which in turn affects educational and economic outcomes (Duncan, Claussens, and Engel 2004). A higher prevalence of children's behavior problems has been found among children in low-income families (Duncan, Brooks-Gunn, and Klebanov 1994). Specifically, when compared to non-poor children, those who live in poverty are more likely to exhibit behavior problems (Duncan and Brooks-Gunn 2000). Our study looks at the effect of material hardship when a child

is age 3 on socioemotional behaviors when the child is age 5. We look at both behavior problems (aggression, withdrawn, anxious/depressed) as well as pro-social behavior.

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 et al. 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. Although material hardships mostly stem from limited financial resources, the empirical literature finds only moderate correlation between income poverty and hardship measures (Mayer and Jencks 1989; Beverly 1999; Boushey and Gunderson 2001; Sullivan, Turner, and Danziger 2008). In addition, Meyer and Sullivan (2003) found that individuals who are consumption poor are not always the same as those who are income poor. 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.

We expect that as material hardships increase behavior problems in children will also increase (and positive behavior will decrease). Both economic theory and the family stress theory suggest that increases in material hardships will likely affect children negatively. Economic theory suggests that money provides parents with the ability to purchase goods and services and enriching experiences that are beneficial to children. Any loss in income or economic stability would likely decrease the ability of parents to purchase these goods that promote child development (Thomson et al. 1994; Haveman and Wolfe 1994). Purchasing lower quality

services (such as daycare), the inability to provide enriching activities, or the change in these circumstances could in turn affect child behaviors.

The family stress model also suggests that increases in material hardship will likely increase child behavior problems and decrease child positive behavior. Financial hardship or pressure can eclipse parents' socioemotional resources and disrupt parent-child interactions (Conger and Conger 2000). 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.

Existing research provides some empirical support for both hypotheses. Gershoff, Aber, Raver and Lennon (2007) look at the effect of material hardship and income on 6 and 7 year old children's emotional and cognitive skills using structural equation modeling. Their analyses look at mediating pathways (parenting quality, stress, and investment) between income and material hardship and child behavior. In support of the family stress model, they find that income and material hardship affect parenting stress and investment which in turn affect child outcomes. In support of economic theory, their study finds that hardship affects parental investment (purchasing cognitively stimulating materials, activities outside the household, extracurricular activities and parental involvement in school). They also find that material hardship and income together better explain the effect on child behavior than income alone. Our study builds on the Gershoff and colleagues (2007) finding that income and material hardship together better explain child behavior and employs more rigorous methodology to get closer to causal estimates of the relationship between material hardship and child behavior. Our study seeks to ascertain direct effect estimates by employing several methodological techniques taking advantage of the

longitudinal nature of our data. We also move beyond their use of a single latent construct of hardship to investigate whether certain types of hardship have differential effects on behavior.

To our knowledge, the study by Gershoff and associates (2007) is the only empirical work to look at the relationship between material hardship and child behavior. However there is a related literature that examines the association between income and material hardship. The results of these studies are mixed and often depend on how income is measured but they generally find that there is an association between income and child socioemotional behavior (Blau 1999; Taylor, Dearing and McCartney 2004; Dahl 2005; Mayer 1997). Studies of income and child behavior often find stronger effects for children in early childhood (Duncan and Brooks-Gunn 1997) as well as for children in families with lower socioeconomic status' (Dearing, McCartney and Taylor 2001; Maurin 2002). Although there are no studies comparing the relationship between material hardship and child behavior by socioeconomic status or child age, the studies of income and child behavior suggest we may be looking at a sample that is most affected by material hardships.

Particular types of hardship may also be more strongly associated with child behaviors. Previous empirical studies focus on food insecurity and find that household food insecurity is negatively associated with child wellbeing (Huang, Oshima, and Kim 2010; Ashiabi and O'Neal 2008). Children living in low-income food insecure households have more behavioral, emotional, and academic problems than their food secure counterparts (Alaimo, Olson, and Frongillo 2001; Kleinman et al. 1998). A few studies have investigated the relationship between food insecurity and housing hardship and child health outcomes and found negative effects (Weinreb et al. 2002; Alaimo et al. 2001, Cook et al, 2004; Weinreb et al. 1998). There are no published studies that look at other types of hardship (i.e. utility or medical hardship) and their

effects on child behavior but we anticipate there may be differential effects of certain domains of hardships on certain types of behavior.

We also investigate the role of long term and recent material hardships on child behavior. Looking at fluctuations and consistency is commonly employed in studies that look at the effect of income on various outcomes (Sullivan et al. 2008) but it has yet to be employed in studies of material hardship and child outcomes. This study is the first to look at the effects of long term and proximal measures of material hardship.

Data and Measures

The present study analyzes data from the Fragile Families and Child Well-being Study (FFCWB) in order to test the hypothesis that material hardship leads to more behavior problems and poor socioemotional adjustment in children. The FFCWB study is 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 et al. 2001 for more detailed information about FFCWB study design). We use data from all four waves in our analyses. Ninety percent of the mothers who completed baseline interviews were re-interviewed when their children were about 1 years old. Eighty-eight percent of eligible mothers were re-interviewed when their children were about 3-years old and 87 percent of eligible mothers were re-interviewed when their children were about 5-years old. Eligibility is defined as having completed the baseline interview.

The core sample is 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. Information on child behavior (the Child Behavior Checklist) comes from the In-Home supplement for which response rates were lower than the main interview.

We restrict our sample to mothers who experience unwed births. Though this analytical sample is not representative of the population of families as a whole, especially those living outside of large US cities and childless households, it is representative of unwed births in urban areas. As a result this sample is very racially diverse and consists 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. Among the 2,322 mothers who were unwed at the focal child's birth and were interviewed in home at the 5-year follow up, 2,191 have information on the material hardship items. Of these families, the sample is further restricted to those with complete data on all covariates at baseline and year 1 (N = 1,842; 84 percent). Mothers in our analytical sample have income to poverty ratios similar to the mothers without full data, but are younger and have higher levels of social support. They are more likely to be black (59 percent vs. 51 percent) and less likely to be Hispanic (25 percent vs. 31 percent); they are 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).

Measures

Child behavior problems. –The FFCWB data allow us to look at the associations between material hardship and children's socioemotional development. We use the Child Behavior Checklist (See Child Behavior Checklist/4-18, Achenbach, 1991) to construct three subscales at ages 3 and 5: Aggressive (19 items α=.88 at age 3; 20 items, α=.84 at age 5), Anxious/Depressed (8 items α=.62 at age 3; 14 items α=.68 at age 5), and Withdrawn behavior (8 items, α=.66 at age

3; 9 items, α=.60 at age 5; see User's Guide for the Five-Year In-home Study 2009). Each measure is based on maternal report. To calculate each dimension, responses to each item are summed (0=not true of my child; 1=sometimes/somewhat true; 2=very/often true). Higher scores reflect more behavior problems such as sadness and nervousness and fighting and bullying. The scale scores are normed to have a mean of zero and standard deviation of one.

Children's positive behavior is assessed using a 13-item and nine-item scale from the Express subscale of the Adaptive Social Behavior Inventory (ASBI; Hogan, Scott, and Bauer 1992) at ages 3 and 5, respectively. The ASBI items measure children's prosocial skills with adults and peers and social competence. Following suit with the other outcomes, maternal responses are summed and normed to have a mean of zero and standard deviation of one.

Material Hardship. –We create a composite material hardship measure as well as measures of different types of hardships. Our aggregate material hardship indicator combines information from nine questions that are summed to create a composite measure. 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 by trying squared and categorical transformations. The relationship between child behavior and material hardship proved to be non-linear, and we create a categorical material hardship variable with five groupings (0, 1, 2, 3, 4 +). Categories in excess of five result in large standard errors due to small sample sizes.

We also create measures of five hardship domains; bills, utility, food, medical, homelessness, and housing instability. All the material hardship questions asked whether the respondent had experienced the hardship in the past 12 months. Each domain is represented by a dichotomous measure that indicates if the hardship dimension is 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 is answered in the affirmative, the respondent is coded as having difficulty paying bills. The disruption in utility is indicated when a respondent confirms that their "telephone service was ever disconnected" or "gas or electricity was turned off." The food hardship measure includes 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 are answered in the affirmative, this indicates the presence of unstable housing. Medical hardship is 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 construct long term and proximal measures of material hardship. We distinguish between experiencing material hardship for two waves (when the child was 1 and 3 years old) or one wave. If the maternal experience of hardship is only experienced at one wave, we further indicate whether it is when the child is 1 or 3 years of age.

Parental characteristics. –We include extensive family background measures including mother, father, and child characteristics. Following previous work on material hardship and child behavior our analyses include 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 and Jenks 1989; Ouellette et al. 2004; Mirowsky and Ross 1999). We include 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 include 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 poor) and her city of residence (city fixed effects).

Research on material hardship has found that marital status is related to hardship (Lerman 2002). As we do not include couples who were married at the time of the birth we include a measure of their relationship status with the father as cohabiting, dating or not in a relationship at the baseline interview. In order to assess fertility history (with respect to the focal child) we include a set of dummy variables that indicate: both parents' first birth, parents' second or later birth together, father has a child with another partner, mother has a child with another partner, or both parents have children with other partners. We also include 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.

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 include 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 and Iceland 2009). We include an indicator whether the mother met the criteria for depression using a conservative measure of the Composite International Diagnostic Interview-Short Form, a standardized tool that assesses respondents' feelings of dysphoria or anhedonia (Kessler et al.

1998). Research has shown that social support is also related to child behavior and material hardship and we include a 6 item index that assesses mother's ability to borrow money, have a loan cosigned, get babysitting when needed, and other instrumental support (Lee, Slack, and Lewis 2004; Ryan, Kalil, and Leininger 2009).

Child characteristics. - Child characteristics include gender, low birth weight status and age (in months).

All control variables are 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. One exception is the measure of impulsivity that was assessed in the year 3 follow-up survey; however it is designed to assess a personality characteristic that we do not expect to change over time.

Analytical Strategies

We employ three types of multivariate models in order to examine the relationship between children's socioemotional development and the maternal experience of material hardship. First we predict behavioral outcomes from material hardship using an ordinary least squares (OLS) model. We estimate the following equation:

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

where Y_{it} denotes the child's score on a particular behavioral outcome at age 5. MH represents measures of material well-being discussed above. We estimate OLS models for each of the three types of hardship constructs: (1) the aggregate categorical measure, (2) the five hardship dimensions, and (3) the duration and proximal constructs. Mom and Child are vectors of family socio-demographic, socio-emotional, and child characteristics, while 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 wellbeing. 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 causal 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 control 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 control 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.

Second, in order to address potential selection bias from unobserved characteristics, we estimate residualized change models (National Institute for Child Health and Human Development Early Child Care Research Network and Duncan 2003) which control 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 the outcome between the two measurement points. This differs from OLS models where hardship coefficients represent mean differences in child behavior by material hardship groups 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 not measured identically over time but are highly correlated (Cronbach and Furby 1970). Second, it can reduce selection bias due to unmeasured child and family characteristics. However, since 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 use robust standard errors in our estimation process. The residualized change model is represented here:

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

where Y_{it} represents the child behavioral outcome and δ_4 represents the analogous earlier assessment at age 3.

Third, we estimate individual fixed effects models which address the issue of unobserved heterogeneity. The individual level fixed effects estimation uses two waves of FFCWB data that contain measures of material hardship and child behavior (the 3-Year and 5-Year follow up surveys). This estimator provides a more conservative approach by controlling for unmeasured time invariant characteristics that are correlated to both the material hardship measure and the child outcome. We also include a number of time-varying covariates that are theoretically believed to influence levels of material hardship and child behavioral outcomes. This includes income-to-needs ratio, maternal and child age, maternal employment status, her levels of depression and social support, and her health. This model takes the form:

$$Y_{it} = \alpha_i + \beta_1 MH_{it} + \beta_2 Mom_{it} + \beta_3 Child_{it} + \varepsilon_{it} \qquad (3)$$

In summary, these methods alleviate some of the potential endogeneity in the relationship between material hardship and child behavior.

Findings

In this section we first describe our sample and report differences between respondents who experience any hardship versus those who do not experience hardship at year 3. We then turn to our first research question which asks about the association between aggregate material hardship and behavioral outcomes and examine this using OLS, residualized change, and fixed effects models. Next we investigate whether there are associations between individual hardships (bills, food etc.) and child socioemotional outcomes using the same three modeling strategies. Lastly, we examine long-term material hardship over two waves and the proximity of experienced hardship for both aggregate and individual measures of hardship and their associations with child behaviors using both OLS and residualized change models.

Sample Description

Table 1 presents means of all child socioemotional outcomes and covariates at age 3. The means are stratified across mothers who experienced one or more hardships versus those who did not experience any. The average number of hardships experienced is just over one and a little over half of the sample report experiencing at least one hardship. In terms of the types of hardship, nearly a third of the sample report difficulty in paying bills and nearly the same number report having their utilities shut off in the past year. Twelve percent experience housing instability and 10 percent report receiving free food or meals. About 7 percent of respondents report an unmet medical need.

The sample is predominantly black (59 percent). Hispanic mothers represent a quarter of the sample, and white mothers make up 15 percent of the sample. Just under half 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. Thirty-seven

percent of mothers have less than a high school degree and another 34 percent have a high school degree. Fifty-four percent of mothers are employed and the mean income-to-needs ratio is 1.29 – just slightly over the Federal poverty threshold.

As hypothesized, children whose mothers reported any material hardship have significantly higher levels of aggression, withdrawn, and anxious/depressed behaviors than those with no maternal experience of material hardship. There are no statistically significant differences on positive behavior between families that experience hardship and those that do not. Mothers also differed in terms of family background and personal characteristics by hardship presence. Mothers who experience material hardship are more likely to be white and less likely to be Hispanic. Mothers who lived with both parents at age 15 are significantly less likely to experience hardship as well as mothers who only have children with the focal child's father. When both the mother and the father have children with another partner then the mother is significantly more likely to experience hardship. Respondents who experience material hardship are in poorer health, more likely to be depressed, have a substance abuse problem, be more impulsive, and have lower levels of social support. Mothers who experience hardship have lower income-to-needs ratios (are poorer) than those who do not experience hardship. Lastly, immigrant mothers, and those whose primary language is Spanish, are significantly less likely to experience hardship.

Results for Aggregate Material Hardship

Table 2 presents the results for OLS models predicting children's behavior in year 5 as a function of material hardship in year 3. Material hardship is positively and strongly associated with aggressive, withdrawn, and anxious/depressed behaviors. Experiencing three hardships is associated with a third of a standard deviation increase in aggressive behavior and withdrawn

behavior, and a fifth of a standard deviation increase in anxious/depressed behavior. Within each outcome, there is no consistent pattern between the number of hardships experienced and child behavior. For example, at least two hardships need to be experienced for there to be a significant relationship between material hardship and anxious/depressed behavior. Four plus hardships is not associated with any outcome, with the exception of aggressive behavior, which is marginally significant. Material hardship is not associated with positive behavior.

Notably, if we look at the covariates, we find that income-to-needs ratio is never significantly associated with child behavior. Boys score significantly higher on aggressive and withdrawn scales and lower on positive behavior. A few maternal characteristics are significantly associated with children's behavioral adjustment. Children with mothers in excellent or good health score significantly lower on aggressive outcomes, while maternal impulsivity is strongly associated with higher aggressive, withdrawn, and anxious/depressed scores and lower positive behavior. Maternal depression and anxiety are associated with children's anxious/depressed behavior.

Despite the rich set of controls included in our OLS models, there is still the possibility of omitted time invariant maternal and child characteristics biasing the relationship between material hardship and children's socioemotional outcomes. To address this concern we estimate residualized change models where we add the analogous age 3 outcome on the right hand side of the equation. Table 3 presents results from the residualized change models. The hardship coefficients are mostly robust to this more stringent estimation. The coefficients for aggressive behavior reduce in size and only higher levels of hardship are significant. The results suggest that experiencing three hardships increases aggressive behavior by a quarter of a standard deviation

from year 3 to year 5. For withdrawn and anxious/depressed behaviors, the associations remain robust to the inclusion of an earlier outcome assessment.

Individual fixed effects analysis is another strategy to address omitted variables bias by differencing out the biasing impacts of persistent characteristics that are associated with both experiencing material hardship and child socioemotional outcomes. We estimate an individual level fixed effects model using two waves of FFCWB data. We also include time varying covariates that can influence material hardship and child outcomes. The second column of Table 3 presents results from the individual fixed effects estimation. Having four plus hardships was associated with nearly a fifth to a quarter of a standard deviation change in child behavior problems, with the exception of positive behavior. The other previously significant associations from the residualized change and OLS models are no longer significant. An individual fixed effects regression strategy relies on changes in material hardship and children's behavior in order to identify coefficients' estimates. These results indicate that child socioemotional wellbeing may not respond strongly to changes in mothers' material hardship experience, especially over a short period of time. Thus, it may be that levels of material hardship at one point in time, as opposed to short term changes of hardship, have a stronger influence on outcomes. Furthermore, measurement error may bias our regression coefficients since our outcome assessments are not measured identically over time. Additionally, differencing may magnify measurement imprecision. Taken together, for the next set of analyses, we rely on residualized change models as our primary estimation strategy due to its ability to control for unobserved heterogeneity while acknowledging the measurement differences in the outcomes. Results for OLS and individual fixed effects models are not shown but are available upon request.

Shared method variance between mother's report of material hardship and children's behavior may threaten construct validity (Bank, Dishion, Skinner, and 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 controlled for maternal depression and cognitive ability and our findings were robust to these controls. This gives us more confidence that our findings are not a result of mother's cognitive or non-cognitive characteristics. In addition, we do a robustness check on maternal reports of child behavior by using data for a 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. Lastly, we examine the relationship between interview ratings of child cooperativeness and child behavior problems and find significant associations. 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 and Brooks-Gunn 2007; Geller, Cooper, Garfinkel, Schwartz-Soicher, and Mincy, Forthcoming). Taken together these findings give us confidence in mothers' appraisals of child behavior and reduce our concerns about shared method variance.

Results for Domains of Material Hardship

Table 4 shows the results from models predicting each of the four child outcomes from each of the five material hardship domains. In the residualized change regressions, we find that difficulty paying bills is associated with a tenth of a standard deviation increase in aggressive behavior and .15 standard deviation increase in anxious/depressed behavior between years 3 and 5, net of all covariates. Utility interruption is only associated with aggressive behavior (.12 of a SD). In contrast to prior work (Kleinman et al. 1998), which shows food insufficiency to be

associated with behavioral problems among low income children, we find no relationship between free food and changes in child behavior. However, our measure of food hardship differs substantially from previous studies of food hardship that use the full Food Security Scale created by the U.S. Department of Agriculture. Lastly, unmet medical needs results in a nearly a third of a standard deviation increase in anxious/depressed behavior between the two waves. The association between medical hardship and anxious/depressed behavior may be spurious if the predicted change in child behavior is a result of a lack of health insurance. Encouragingly, our results hold when we re-run the models controlling for health insurance coverage.

As compared to the residualized change models, the findings from OLS models were similarly statistically and substantively significant, and the more conservative fixed effects regression strategy did not yield statistically significant associations for any of the outcomes and hardship types.

Results for Long-Term and Proximal Material Hardship

Table 5 presents results from predicting child socioemotional outcomes from long-term and proximal experience of material hardship. Experiencing material hardship at Year 1 and 3 is associated with child behavior (a .1 to .2 standard deviation increase in child behavior from year 3 to year 5), with the exception of positive behavior. With respect to proximity of hardship experience, the later wave of hardship is significantly associated with changes in aggressive and withdrawn behavior (.14 and .16 SD, respectively) whereas the earlier wave was not significantly associated with any behavior. Large confidence intervals in the change models suggest no differences between experiencing two years versus one year of hardship, regardless of wave.

In estimating the relationship between duration and proximity of hardship dimensions and child outcomes (results not shown), there was no consistent pattern within outcome or

hardship domain. Most of the robust findings came with experiencing a hardship for two waves. Problems with paying bills for two waves are associated with an increase in anxious/depressed behavior by nearly a fifth of a standard deviation from year 3 to year 5. Utility interruptions are associated with a quarter of a standard deviation increase in aggressive behavior, while unstable housing over two years increases withdrawn behavior by two-fifths of a standard deviation. However, imprecision in estimates precludes rejecting the null hypothesis of differences between duration and proximity of hardship experience.

Conclusion

Our findings contribute to the large body of research that links childhood poverty and financial hardship with adverse child socioemotional outcomes (Duncan and 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 and Michael 1995) and the empirical evidence for the moderate correlation between income poverty and hardship measures (Mayer and Jencks 1989). Our study found significant links between material hardship and children's behavioral adjustment using a recent longitudinal birth cohort study and employing varying approaches to control for unmeasured heterogeneity.

Our findings suggest a link between material hardship and child socioemotional outcomes and are consistent with Gershoff and associates (2007) who find significant associations between material hardship and internalizing and externalizing behavior problems. In residualized change models, a rigorous strategy to address unobserved heterogeneity when outcome measures are correlated but not identical, we find material hardship is associated with an increase in aggressive, withdrawn, and anxious/depressed behavior. OLS modeling techniques

yielded slightly larger results whereas in the individual fixed effects regressions our coefficients were reduced and became insignificant, with the exception of experiencing four plus hardships. The individual fixed effects estimation process relies on changes in both material hardship and children's behavior in order to indentify coefficients and thus renders estimation on a unique sample of mothers who change levels of hardship between years 3 and 5 and whose children change on their behavior rating. We recognize that these results may be driven by unobserved persistent selection factors that are correlated with both maternal hardship and children's behavior but at the same time worry that the fixed effects strategy is troubled by measurement error due to differences in outcome measurements. Rather than negating the OLS and residualized change findings, we believe these results imply that children's socioemotional outcomes may not respond to short term changes in material hardship. When we examine hardship domains we find that difficulty paying bills, utility interruption, and unmet medical needs lead to significant increases in child behavioral problems. Finally, we found that experiencing material hardship over the longer term is associated with child behavior problems. Although, we found experiencing hardship at age 3 (as opposed to at age 1) had a more significant impact on child outcomes (aggressive and withdrawn behaviors), these estimates were not substantively different from each other. These findings may be affected by the age of the child – one year olds may not notice material hardship whereas older children may be more impacted by material hardship. These findings may imply that material hardship's relations with child behavior differ by developmental trajectory.

Our study is not without limitations. We exclude from our analysis mothers who were married to the fathers of their child at the time of birth. This limits our conclusions to children of unmarried mothers. Future research using a nationally representative sample can shed further

light on the dynamics of low-income 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 depressive or withdrawn behaviors. Future research should investigate this relationship with older children.

More broadly, as we examine the policy context in which low-income parents are raising children, it is critical to consider how policy can help these families avoid material hardship. The economic strain 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 medical costs, utilities and other fixed costs may be particularly efficacious.

References

Achenbach, Thomas M. 1992. *Manual for Child Behavior Checklist/2-3 and 1992 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.

Alaimo, Katherine, Christine M. Olson, and Edward A. Frongillo Jr. 2001. "Food Insufficiency and American School-Aged Children's Cognitive, Academic, and Psychosocial Development." *Pediatrics* 108 (1): 44–53.

Alaimo, Katherine, Christine M. Olson, Edward A. Frongillo Jr., and Ronette R. Briefel. 2001. "Food Insufficiency, Family Income, and Health in US Preschool and School-Aged Children." *American Journal of Public Health* 91 (5): 781–86.

Ashiabi, Godwin S., and Keri K. O'Neal. 2008. "A Framework for Understanding the Association between Food Insecurity and Children's Developmental Outcomes." *Child Development Perspectives* 2 (2): 71–77.

Aughinbaugh, Alison A., and Maury Gittleman. 2003. "Does Money Matter? A Comparison of the Effect of Income on Child Development in the United States and Great Britain." *Journal of Human Resources* 38(2): 416-440.

Bank, Lewis I.., Thomas Dishion, Michael Skinner, and Gerald R.Patterson. 1990. "Method variance in structural equation modeling: Living with ''glop.''" In Gerald R. Patterson (Ed.), *Depression and aggression in family interaction* (pp. 247 – 279). Hillsdale, NJ: Erlbaum.

Bauman, Kurt. 1999. "Shifting Family Definitions: The Effect of Cohabitation and Other Non family Household Relationships on Measures of Poverty." *Demography* 36(3):315-325.

Berger, Lonnie, Christina Paxon, and Jane Waldfogel. 2009. "Income and Child Development." *Children and Youth Services Review* 31(9): 978-989.

Beverly, Sondra. 2001. "Material Hardship in the United States: Evidence from the Survey of Income and Program Participation" *Social Work Research* 25(3): 143.

Blau, David. 1999. "The Effect of Income on Child Development." *Review of Economics and Statistics* 81(2): 261-276.

Boushey, Heather, and Bethney Gundersen. 2001. "When Work Just Isn't Enough: Measuring Hardship faced by families after moving from welfare to work." Briefing paper, Washington DC: *Economic Policy Institute*.
Available at: Http://www.epi.org/briefingpapers/hardshipsbp.pdf

Costello, E. Jane, Scott Compton, Gordon Keeler, and Adrian Angold. 2003. Relationship between Poverty and Psyschopathology: A Natural Experiment. *Journal of the American Medical Association* 290: 2023-2029,

Citro, Constance, and Robert Michael. 1995. "*Measuring Poverty : A new approach".* Washington, DC: National Academy Press

Cook, John T., Deborah A. Frank, Carol Berkowitz, Maureen M. Black, Patrick H. Casey, Diana B. Cutts, Alan F. Meyers, Nieves Zaldivar, Anne Skalicky, Suzette Levenson, Tim Heeren, and Mark Nord. 2004. "Food Insecurity Is Associated with Adverse Health Outcomes among Human Infants and Toddlers." *Journal of Nutrition* 134 (6): 1432–38.

Cronbach, Lee J., and Lita Furby. 1970."How should we measure ''change''? — Or should we?" *Psychological Bulletin* 74: 68 – 80.

Dahl, Gordon, and Lance Lochner. 2005. "The Impact of Family Income on Child Achievement." *NBER Working Paper* 11279.

Dearing, Eric, Kathleen McCartney, and Beck Taylor. 2001. "Change in Family Income-to-Needs Matters More for Children with Less." *Child Development* 72(6): 1779-1793.

Dickman, Scott J. 1990. "Functional and dysfunctional impulsivity: Personality and cognitive correlates." *Journal of Personality and Social Psychology* 58(1): 95-102.

Duncan, Greg and Jeanne Brooks-Gunn. (eds) 1997. *Consequences of Growing Up Poor* New York: Russell Sage.

Duncan, Greg, Jeanne Brooks-Gunn and Pamela Klebanov. 1994. "Economic Deprivation and Early Childhood Development," *Child Development* 65(2): 269-318

Duncan, Greg, Angelika Claussens, and Mimi Engel. 2004. "The contribution of hard skills and socio-emotional behavior to school readiness." *Mimeo. Northwestern University.*

Duncan, Greg, W. Jean Yeung, Jeanne Brooks-Gunn, and Judith R. Smith. 1998. "How much does childhood poverty affect the life chances of children?" *American Sociological Review* 63(3): 406-423.

Five-Year In-home Longitudinal Study of Pre-School Aged Children: User's Guide.2009. *Center for Research on Child Wellbeing*. Available at http://www.fragilefamilies.princeton.edu/documentation.asp.

Geller, Amanda, Cary Cooper, Irwin Garfinkel, Ofira Schwartz-Soicher and Ron Mincy. Forthcoming. "Beyond Absenteeism: Father Incarceration and Child Development." *Demography.*

Gershoff, Elizabeth T., J. Lawrence Aber, C. Cybele Raver, Mary Clare Lennon. 2007. "Income is Not Enough: Incorporating Material Hardship into Models of Income Associations with Parent Mediators and Child Outcomes." *Child Development* 78(1): 70-95.

Guo, Guang, and Kathleen Mullin Harris. 2000. “The Mechanisms Mediating the Effects of Poverty on Children’s Intellectual Development.” *Demography* 37(4): 431-447.

Haveman, Robert and Barbara Wolfe. 1995. “The Determinants of Children's Attainments: A Review of Methods and Findings.” *Journal of Economic Literature* 33(4): 1829-1878.

Heflin, Colleen. 2006. “Dynamics of Material Hardship in the Women’s Employment Study University of Kentucky.” *Working Paper: Institute for Research on Poverty*.

Heflin, Colleen M. and John Iceland. 2009. “Poverty, Hardship and Depression.” *Social Science Quarterly*. 90(5): 1051-1071.

Hogan, Ann E., Keith G. Scott, and Charles R. Bauer. 1992. “The Adaptive Social Behvaior Inventory (ASBI): A new assessment of social competence in high-risk five-year-olds.” *Journal of Psychoeducational Assessment* 10:230-239.

Huang, Jin, Karen Oshima, and Youngmi Kim. 2010. “Does Food Insecurity Affect Parental Characteristics and Child Behavior? Testing Mediation Effects” *Social Service Review* 84 (3): 381-401.

Kessler, Ronald C., Gavin Andrews, Daniel Mroczek., T.Bedirhan Ustun, and Hans-Ulrich Wittchen. 1998. “The World Health Organization Composite International Diagnostic Interview Short Form (CIDI-SF).” *International Journal of Methods in Psychiatric Research* 7(4): 171-185.

Kleinman, Ronald E., J. Michael Murphy, Michelle Little, Maria Pagano, Cheryl A. Wehler, Kenneth Regal, and Michael S. Jellinek. 1998. “Hunger in Children in the United States: Potential Behavioral and Emotional Correlates.” *Pediatrics* 101 (1): e3.

Korenman, Sanders, Jane Miller, and John E. Sjaastad. 1995.“Long-Term Poverty and Child Development in the United States: Results from the NLSY.” *Children and Youth Services Review* 17: 127-155.

Lee, Bong Joo, Kristen S. Slack, and Dan A. Lewis. 2004. Are Welfare Sanctions Working as Intended? Welfare Receipt, Work Activity, and Material Hardship among TANF-Recipient Families. *The Social Service Review* 78 (3):370.

Lerman, Robert. 2002. “How Do Marriage, Cohabitation, and Single Parenthood Affect the Material Hardships of Families with Children?” *Urban Institute and American University*.

Maurin, Eric. 2002. “The Impact of Parental Income on Early Schooling Transitions: A Re-Examination Using Data over Three Generations.” *Journal of Public Economics* 85: 301-332.

Mayer, Susan. 1997. *What Money Can’t Buy: The Effect of Parental Income on Children’s Outcomes*. Cambridge: Harvard University Press.

Mayer, Susan, and Christopher Jencks. 1989. “Poverty and the Distribution of Material Hardship.” *The Journal of Human Resources* 24(1):. 88-114.

Meadows, Sarah O., Sara S. McLanahan, and Jeanne Brooks-Gunn. 2007. "Parental Depression and Anxiety and Early Childhood Behavior Problems across Family Types." *Journal of Marriage and Family* 69:1162-1177.

Mirowsky, John, and Catherine E. Ross. 1999. “Economic hardship across the life course.” *American Sociological Review* 64, 577-584.

Morris, Pamela A., Greg J. Duncan, and Elizabeth Clark-Kauffman. 2005. “Child well-being in an era of welfare reform: The sensitivity of transitions in development to policy change.” *Developmental Psychology* 41:919-932

Morris, Pamela, Greg Duncan, and Christopher Rodrigues. 2004. “Using Welfare Reform Experiments to Estimate the Impact of Income on Child Achievement.” *Working paper, Northwestern University*.

Morris, Pamela and Lisa Gennetian. 2003. “Identifying the Effects of Income on Children’s Development Using Experimental Data.” *Journal of Marriage and Family* 65: 716-729.

NICHD Early Child Care Research Network. 2004. “Trajectories of Physical Aggression from Toddlerhood to Middle Childhood.” *Monographs of the Society for Research in Child Development* 69: vii-129.

National Institute of Child Health and Human Development Early Child Care Research Network, and Greg Duncan. 2003.” Modeling the impacts of child care quality on children’s preschool cognitive development.” *Child Development* 74: 1454 – 1475.

Ouellette, Tammy, Nancy Burstein, David Long, Erik Beecroft. 2004. *Measures of Material Hardship: Final Report*, Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation.

Rector, Robert, Kirk Johnson, and Sara E. Youssef. 1999. “The extent of material hardship and poverty in the United States.” *Review of Social Economy* 57(3): 351-358.

Reichman, Nancy, Julien Teitler, Irwin Garfinkel, and Sara S. McLanahan. 2001. “Fragile families: Sample and design.” *Children and Youth Services Review* 23: 303-326.

Ryan, Rebecca, Ariel Kalil, and Lindsey Leininger. 2009. “Low-Income Mothers’ Private Safety Nets and Children’s Socioemotional Well-Being.” *Journal of Marriage and Family* 71: 278-297.

Shea, John. 2000. “Does Parents’ Money Matter?” *Journal of Public Economics* 77(2): 155-184.

Short, Kathleen. 2005. “Material and Financial Hardship and Income-Based Poverty Measures in the USA.” *Journal of Social Policy* 34(1):21-38

Sullivan, James X., Lesley Turner, and Sheldon Danziger. 2008. "The Relationship between Income and Material Hardship." *Journal of Policy Analysis and Management* 27(1): 63-81.

Taylor, Beck, Eric Dearing, and Kathleen McCartney. 2004. "Incomes and Outcomes in Early Childhood." *Journal of Human Resources* 34(4): 980-1007.

Weinreb Linda, Robert Goldberg, Ellen Bassuk, and Jennifer Perloff. 1998. "Determinants of health and service use patterns in homeless and low-income housed children." *Pediatrics* 102:554-562.

Weinreb, Linda, Cheryl A. Wehler, Jennifer Perloff, Richard Scott, David Hosmer, Linda Sagor, and Craig Gundersen. 2002. "Hunger: Its Impact on Children's Health and Mental Health." *Pediatrics* 110 (4): e41.

Yeung, W. Jean, Miriam R. Linver, and Jeanne Brooks-Gunn. 2002. "How Money Matters for Young Children's Development: Parental Investment and Family Processes." *Child Development* 73(6): 1861-79.

Table 1. Sample Descriptives (Means and Frequencies)
by Material Hardship when the Baby is Three Years Old (N=1,832)

	Overall		Hardship		No Hardship	
	***M* or %**	**(SD)**	***M* or %**	**(SD)**	***M* or %**	**(SD)**
Material Hardship Index	1.03	(1.33)	-		-	
Difficulty Paying Bills	31.8		-		-	
Utilities Shut Off	29.9		-		-	
Housing Instability	12.1		-		-	
Food Hardship	9.9		-		-	
Medical Hardship	6.5		-		-	
Child Behavior at 5-Year Survey						
Aggressive (mean, range = 0-36)	11.23	(6.47)	12.15	(6.57)	10.24	(6.21)
Withdrawn (mean, range=0-13)	2.18	(2.05)	2.35	(2.14)	2.01	(1.96)
Anxious/depressed (mean, range=0-20)	3.52	(3.08)	3.73	(3.20)	3.30	(2.93)
Positive behavior (mean, range=0-26)	20.76	(3.36)	20.82	(3.36)	20.70	(3.36)
Age						
Mother at baby's birth (in years)	23.65	(5.45)	23.64	(5.40)	23.65	(5.51)
Child's age at first follow-up (in months)	15.02	(3.46)	14.91	(3.41)	15.15	(3.51)
Father more than 5 years older than mother	27.74		26.7		28.93	
Mothers' race/ethnicity						
White non-Hispanic	14.8		16.7		12.6	
Black non-Hispanic	58.6		60.4		56.6	
Hispanic	25.0		21.4		29.0	
Other non-Hispanic	1.6		21.4		1.7	
Parents are of different race/ethnicity	14.1		14.8		13.3	
Mother lived with both parents at age 15	34.7		30.9		39.0	
Mother's education						
Less than high school	37.4		39.0		35.5	
High school degree	34.3		32.5		36.3	
Some college	25.5		26.2		24.6	
Bachelor's degree or higher	2.9		2.3		3.5	
Father's education is greater than the mother's	23.9		22.4		25.5	
Relationship with child's father						
Cohabiting	47.5		47.5		47.5	
Friends	45.1		44.4		45.8	
Rarely/never see each other	7.4		8.1		6.7	
Multi-partner fertility						
Neither has children with other partners	37.6		34.5		41.0	
Father has children with other partners	21.3		21.5		21.2	
Mother has children with other partners	18.4		18.4		18.5	
Both have children with other partners	22.6		25.6		19.4	
Child is a boy	51.7		52.7		50.7	
Baby was born low birth weight	11.7		11.5		11.9	

Mother's health is excellent, very good, or good	85.9		82.4		89.9	
Mother has a substance abuse problem	3.6		4.7		2.5	
Mother has depression[1]	13.4		16.9		9.6	
Mother has anxiety[2]	3.3		4.4		2.1	
Mother's impulsivity (mean, range=1-4)[3]*	2.06	(.60)	2.11	(.60)	2.01	(.60)
Mother's cognitive score (mean, range=0-15)[4]*	6.54	(2.50)	6.62	(2.52)	6.44	(2.46)
Mother's social support (mean, range=0-6)[5]	3.81	(1.75)	3.54	(1.78)	4.11	(1.67)
Mother is employed	54.2		53.4		55.1	
Income-to-needs ratio (mean)	1.29	(1.27)	1.14	(1.16)	1.46	(1.38)
Mother is an immigrant	8.8		5.8		12.1	
Primary language is Spanish	5.5		4.4		6.8	
N	1,832		964		868	

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.

[1]From the Composite International Diagnostic Interview-Short Form. Indicates whether respondent meets the conservative criteria for depressive symptoms. [2]From the Composite International Diagnostic Interview-Short Form. Indicates whether respondent meets the criteria for generalized anxiety disorder. [3]From Dickman's Impulsivity Scale. [4] From the Weschler Adult Intelligence Scare - Revised (WAIS-R). [5] Index of 6 questions on social support.

Table 2. Ordinary Least Squares: Material Hardship on Child Behaviors

	Aggressive	Withdrawn	Anxious/Depressed	Positive behavior
Material hardship				
One hardship	.12**	.12**	.03	.04
	(.06)	(.06)	(.06)	(.05)
Two hardships	.21***	.05	.17***	-0.01
	(.07)	(.08)	.07	.07
Three hardships	.35***	.29***	.21**	0.05
	(.10)	(.11)	(.11)	(.09)
Four plus hardships	.20*	.11	.14	0.09
	(.11)	(.11)	(.11)	(.10)
Mother's age	-0.01**	-0.01*	0	-0.01
	(.01)	(.02)	(.01)	(.01)
Father 5 + years older than mother	-0.08	-0.03	-0.02	0
	(.05)	(.05)	(.06)	(.05)
Child's age	-0.02*	0.02	-0.02*	-0.01
	(.01)	(.01)	(.01)	(.01)
White non-Hispanic	0.18**	-0.01	0.13	0.05
	(.08)	(.08)	(.08)	(.07)
Hispanic	0.10	0.10	0.16*	-0.02
	(.09)	(.09)	(.09)	(.08)
Other non-Hispanic	0.40**	0.48**	0.24	-0.05
	(.18)	(.23)	(.19)	(.18)
Parents are of different race/ethnicity	0.40**	-0.10	-0.04	0.05
	(.18)	(.06)	(.07)	(.06)
Mother lived with both parents at age 15	0.00	-0.05	-0.03	-0.04
	(.05)	(.05)	(.05)	(.05)
High school degree	-0.08	-0.06	-0.02	0.09
	(.07)	(.06)	(.06)	(.06)
Some college	-0.08	-0.19**	-0.07	0.14**
	(.07)	(.07)	(.07)	(.07)
Bachelor's degree or higher	-0.25*	-0.08	-0.04	0.08
	(.15)	(.14)	(.14)	(.14)
Father's education is greater than the mother's	-0.03	-0.02	0.02	0.01
	(.06)	(.06)	(.06)	(.06)
Friends	0.10**	-0.03	0.05	0.04
	(.05)	(.05)	(.05)	(.05)
Rarely/never see each other	0.12	-0.01	0.07	-0.14
	(.01)	(.09)	(.10)	(.10)
Father has children with other partners	0.07	-0.01	-0.02	-0.02
	(.06)	(.07)	(.07)	(.06)
Mother has children with other partners	0.16**	-0.06	-0.09	-0.16**
	(.07)	(.07)	(.07)	(.07)
Both have children with other partners	0.23***	0.08	0.01	-0.07
	(.07)	(.08)	(.08)	(.05)
Child is a boy	0.11**	0.09*	-0.02	-0.11***
	(.05)	(.05)	(.05)	(.04)
Baby was born low birth weight	0.07	0.12	-0.02	-0.13*
	(.08)	(.07)	(.07)	(.08)
Mother's good health	-0.20***	0	-0.12	0.14*

	(.07)	(.07)	(.08)	(.07)
Mother has a substance abuse problem	0.15	-0.19*	0.28**	-0.04
	(.12)	(.10)	(.13)	(.09)
Mother has depression	0.12	0.12	0.24***	0.03
	(.07)	(.08)	(.08)	(.07)
Mother has anxiety	-0.00	0.17	0.47***	0.22*
	(.14)	(.14)	(.17)	(.12)
Mother's impulsivity	0.24***	0.15***	0.19***	-0.11***
	(.04)	(.04)	(.04)	(.04)
Mother's cognitive score	-0.00	-0.04***	-0.03***	0.03***
	(.01)	(.01)	(.01)	(.01)
Mother's social support	-0.04**	-0.02	-0.02	0.03**
	(.01)	(.02)	(.01)	(.01)
Mother is employed	-0.07	-0.07	0	0.05
	(.05)	(.05)	(.05)	(.05)
Income-to-needs ratio	-0.00	-0.01	0	0
	(.01)	(.02)	(.02)	(.02)
Mother is an immigrant	0.12	-0.07	0.14	-0.27**
	(.12)	(.12)	(.13)	(.12)
Primary language is Spanish	-0.15	0.01	0.36**	-0.15
	(.14)	(.16)	(.17)	(.15)
Constant	0.06	-0.32	0.07	-0.04
	(.27)	(.26)	(.29)	.28
Observations	1,715	1727	1737	1801
R-squared	0.13	0.10	0.12	0.13

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Residualized Change Estimates and Fixed Effects Estimates of Material Hardship on Child Behavior

	Residualized Change		Fixed Effects	
	β	**SE**	**β**	**SE**
Aggressive				
One hardship	0.07	(.05)	0.04	(.05)
Two hardships	0.15**	(.07)	0.08	(.06)
Three hardships	0.25***	(.09)	-0.03	(.08)
Four plus hardships	0.12	(.11)	0.18**	(.09)
Aggression Yr 3	0.54***	(.03)		
Withdrawn				
One hardship	0.16***	(.06)	0.01	(.06)
Two hardships	0.09	(.08)	0.08	(.07)
Three hardships	0.30***	(.11)	0.05	(.09)
Four plus hardships	0.12	(.11)	0.19**	(.10)
Withdrawn Yr 3	0.31***	(.03)		
Anxious/depressed				
One hardship	0.00	(.06)	0.17***	(.05)
Two hardships	0.23***	(.07)	0.05	(.07)
Three hardships	0.20*	(.11)	-0.01	(.09)
Four plus hardships	0.09	(.11)	0.27***	(.10)
Anxious/depressed Yr 3	0.34***	(.03)		
Positive behavior				
One hardship	0.01	(.06)	0.01	(.06)
Two hardships	0.02	(.07)	0.06	(.07)
Three hardships	0.04	(.09)	0.07	(.10)
Four plus hardships	-0.01	(.11)	-0.05	(.11)
Positive behavior Yr 3	0.27***	(.03)		

Note: Not shown here, the residualized change model include controls for race, education, age, income, relationship status, multiple partner fertility, income-to-needs, immigrant status, spanish language, employment, child gender, child low birth weight, mother lived with both parents at age 15, city, mother mental and physical health, mother cognitive ability, impulsivity and social support. The fixed effects models include income to needs, mom and child's age, employment, social support, health and depression in the model.

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Residualized Change Regressions of Dimensions of Material Hardship on Child Behaviors

	Aggressive (n=1,268)		Withdrawn (n=1,275)		Anxious/Depressed (n=1,283)		Positive behavior (n=1,317)	
	β	**SE**	**β**	**SE**	**β**	**SE**	**β**	**SE**
Difficulty Paying Bills	0.10*	(.06)	0.09	(.06)	0.15**	(.06)	0.02	(.06)
Utilities Shut Off	0.12**	(.06)	0.02	(.07)	0.03	(.06)	-0.02	(.06)
Housing Instability	0.11	(.08)	0.15	(.09)	0.05	(.09)	0.04	(.08)
Food Hardship	0.04	(.09)	0.17	(.11)	0.01	(.11)	-0.06	(.10)
Medical Hardship	0.01	(.11)	0.10	(.13)	0.32***	(.11)	0.17	(.11)

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

*** p<0.01, ** p<0.05, * p<0.1

Table 5. Residualized Change Regressions of Duration and Proximity Effect of Material Hardship on Child Behavior

	Aggressive		Withdrawn		Anxious/Depressed		Positive behavior	
	β	SE	β	SE	β	SE	β	SE
Hardship at 1-Year and 3-Year Survey	0.11**	(.06)	0.20***	(.06)	0.12*	(.06)	0.03	(.06)
Hardship at 1-Year Survey	0.02	(.07)	0.07	(.08)	0.06	(.07)	0.05	(.08)
Hardship at 3-Year Survey	0.14**	(.06)	.16**	(.07)	0.11	(.07)	0.04	(.07)

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

*** p<0.01, ** p<0.05, * p<0.1