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The Effect of Paternal Incarceration on Material Hardship

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Abstract

Widespread use of incarceration in the US, coupled with high rates of inmate fatherhood, has raised concerns for the wellbeing of more than two million affected children. The deleterious and long term effects of incarceration on men's financial and relationship stability are well-established. Incarceration also compromises family material wellbeing, and partners are at risk of hardship and stress, which may diminish capacity for positive parenting and harm children's development. However, little is known about the links between father incarceration and family material wellbeing.

Using the Fragile Families and Child Wellbeing survey we examine the extent to which fathers' incarceration increases the material hardship experienced by their families. We find that incarceration indeed increases hardship for families, by both reducing household income and disrupting family relationships and routines. These findings underscore the need for criminal justice agencies and social service providers to help mitigate the risks associated with a father's incarceration.

Keywords: Incarceration, Material Hardship, Paternal Involvement, Paternal Support

Introduction

The sharp and unprecedented increase in incarceration rates over the past 30 years has raised serious concerns about the communities that individuals in jail and prison leave behind. Incarceration's consequences for families have the potential to be particularly troubling, as the majority of incarcerated individuals are parents to children under 18. In 2002, more than two million children, over 2% of the population under 18 years old, had a parent (usually fathers) in jail or prison (Mumola, 2006).

One way in which incarceration may threaten family wellbeing is through a compromise of material resources. This risk has drawn the attention of researchers and policymakers, since the deprivation of resources, and the material hardship and residential instability which often follow, has been shown to negatively influence children's development (Hauser, Brown, & Prosser 1997). In addition, family process models indicate that the psychological distress associated with economic hardship diminishes parents' capacity for the positive parenting behaviors that promote children's healthy development (McLoyd 1998; Raver, Gershoff, & Aber 2007). Children experiencing food insufficiency or other forms of hardship have lower cognitive ability, more behavior problems, lower academic achievements and are in worse health condition (Alaimo, Olson and Frognillo, 2001; Slack and Yoo, 2005; Whitaker, Phillips and Orzol, 2006; Gershoff, Raver, Aber and Lennon, 2007.)

While the damaging effects of incarceration on men's labor market performance and romantic relationships are well documented (see Western, Kling and Weiman, 2001; Western, 2002; Pager, 2003; Lewis, Garfinkel and Gao, 2007; Kling 2006 for discussions of labor market consequences, and Western 2006 for a review of relationship effects), and a growing literature suggests that incarceration strains the finances of the partners and children of incarcerated men (Hairston, 1998; Geller, Garfinkel and Western,

forthcoming), little is known empirically about the extent to which paternal incarceration might affect family resources beyond household income (Western and Wildeman 2009). In this analysis, we examine incarceration's effects on a broad, consumption-based measure of family material hardship, which identifies families who can not meet basic needs such as food, housing and medical care. In recent years, material hardship has gained prominence as measure of economic wellbeing to serve as an alternative or complement to poverty measures (Beverly, 2001; Ouellette, Burnstein, Long and Beecroft, 2004), and we examine the extent to which it is affected by paternal incarceration.

Background

There are a number of mechanisms by which incarceration might compromise families' material wellbeing. When resident fathers are incarcerated, their families are deprived of any money that they earn and share with their family. Likewise, when nonresident fathers are incarcerated, they are incapacitated from providing either formal or informal child support (Geller, Garfinkel, and Western forthcoming). Having a parent in prison may also impose additional financial burdens on families (Western and Wildeman 2009). Hairston (1998) found that collect phone calls from inmates to their families are three times more expensive than calls placed collect from a regular pay phone (outside of prison) and five times more expensive than collect calls placed from residential phones. The costs of legal representation and visiting prison facilities, many of which are located far from the areas where prisoners' families live, may also add to families' financial strains (Comfort 2008; Western and Wildeman 2009). Incarceration is therefore likely to pose an even greater threat to family material wellbeing than does other paternal absence.

Incarceration may also diminish the abilities of remaining family members to manage their household resources. Increased financial burden faced by women as a result of their partners' incarceration may negatively affect their mental health. Child behavior problems, which are elevated among children of incarcerated parents (See Murray et al. 2009 for a systematic review; Geller et al., 2010) may also elevate maternal stress (Center for Research on Child Wellbeing 2010). These challenges could diminish mothers' ability to manage their family's financial resources. In addition, the incarceration of a husband or partner may stigmatize mothers in the eyes of their communities (Edin, 2004), leaving them ostracized at the very time when they need both financial and emotional support. These challenges may also be greater following a father's incarceration than in other cases of paternal absence.

The family risks posed by paternal incarceration are not limited to the time that fathers spend in prison and jail. Geller, Garfinkel, and Western (forthcoming) find that incarceration significantly reduces fathers' financial contributions to their families, and that the effect is driven not only by men's diminished earnings while in prison and jail, but also by incarceration's destabilizing effects on both family relationships and men's labor market performance after release (See Western 2006 for a detailed discussion). Fathers' incarceration may thus have negative effects on family finances that persist long after the period of his sentence.

On the other hand, the incarceration of a criminally involved father may reduce family material hardship. Some fathers use family resources to purchase illegal drugs or for other criminal activity, and removing these men from the household may ease their family's financial burdens. Edin (2004) suggests that father incarceration, particularly in cases of family violence, has the potential to eliminate a destabilizing influence and leave mothers better able to manage family resources. She also suggests that some men may

see their incarceration as a “turning point”, at which they redirect their lives, become better partners, and contribute more to their families, upon their release.

Empirically, little is known about the effects of incarceration on family material hardship, or families’ ability to meet basic needs (e.g. food, housing, medical care). The most commonly used measure of financial distress is poverty, but the poverty measure is based solely on household income and household size, and thus cannot capture any ill effects of added expenses. Several studies have shown that the relationship between current income and material hardship is weak (Mayer and Jencks, 1989; Sullivan, Turner, Danziger, 2008; Beverly, 2001), suggesting a need to examine the effects of incarceration on hardship as well as income.

Two studies have examined the relationship between paternal incarceration and families’ ability to meet their basic needs. Phillips, Erkanli, Keeler, Costello, and Angold (2006) examined the Great Smoky Mountain Study, a population-based sample of youth in 11 rural counties, and found significant associations between parental incarceration and family economic strain, a measure that includes a reduced standard of living, and the inability to meet children’s basic needs. Geller, Garfinkel, Cooper, and Mincy (2009) use the Fragile Families and Child Wellbeing survey to examine the relationship between parental incarceration and several measures of wellbeing among 3-year old children. The authors find that children whose fathers have been incarcerated face significantly more economic, family, and residential instability. Fathers who have been incarcerated are less likely to be employed when their child is three years old, and if employed, earn lower wages and contribute less cash support to their partners and children. The authors also find that children of incarcerated parents are more likely to experience material hardship.

While both Phillips et al. (2006) and Geller et al. (2009) examine associations between incarceration and material hardship, neither study examines the causal nature of

these relationships. The relationships they observe may be the result of differences between groups other than paternal incarceration, such as mothers' physical or mental health, or unobserved differences between fathers who are and are not incarcerated. The observed relationships may also reflect "reverse causality," if family hardship leads fathers to engage in illegal activity to supplement insufficient resources, in turn leading to incarceration. We therefore build upon these findings by examining the potential causal relationship between fathers' incarceration and the hardship experienced by the families they leave behind. We use a population-based, longitudinal dataset that allows the control of a rich set of family circumstances that might confound the relationship between incarceration and material hardship. We leverage the longitudinal nature of this data in a number of statistical analyses that reduce the likelihood of reverse causality, and further test the plausibility of a causal relationship by examining a number of potential mechanisms through which effects might occur.

Data and Methods

Data Source

We examine the relationship between incarceration and material hardship using the Fragile Families and Child Wellbeing Study (FFCWB). The survey follows a cohort of nearly 5,000 couples with children born between 1998 and 2000 in twenty large U.S. cities. Unmarried parents are systematically over sampled in the study, though when weighted or regression-adjusted, the data are nationally representative of urban families with children. Both mothers and fathers were initially interviewed at the time of their child's birth, with follow-up interviews conducted when the children were one, three and five years old.

The FFCWB study was initially designed to address three areas of interest—nonmarital childbearing, the role of fathers, and welfare reform—and their effects on family formation and children’s wellbeing. It has since expanded to further examine the roles of social and material disadvantage (see Reichman et al. 2001 for information about FFCWB study design), and provides valuable information about the effects of incarceration on families. The survey’s oversample of unmarried parents provides a sample of highly socio-economically disadvantaged families, with a high prevalence of paternal incarceration. By the time of the five-year follow-up almost 50% of fathers were reported to have been incarcerated at some point in their lives. The FFCWB study is also unique in its connection of incarcerated fathers to their families, since most family surveys do not include information on parents’ incarceration, and inmate surveys do not usually follow families of survey participants.

The survey is also well-suited for the analysis of material hardship, as it allows the examination of different aspects of disadvantage including food insecurity, lack of medical care and inability to pay bills. Questions about these distinct forms of disadvantage are asked at every follow-up wave, allowing a longitudinal evaluation of changes in hardship. The dataset also contains indicators of mothers’ mental health and other long-standing characteristics that are likely to affect their ability to manage household resources, which are unobserved in most social surveys. Finally, the data allow the examination of the effects of incarceration on hardship, net of effects on poverty, reflecting the distinctions noted by Beverly (2001) and Ouelette, Burnstein, Long, and Becroft. (2004).

Measures

Material Hardship

The dependent variable, material hardship, is an index that examines the extent to which families face difficulties meeting their basic needs. Despite the recent interest in material hardship as a measure of well-being, to date there is no one common measure of material hardship used in US studies. The decisions as to which items to include in a hardship index are left to individual researchers (Short, 2005.) Our measure, similar to the one used by Mayer and Jencks (1989), uses mothers' self reports at each follow-up interview, noting whether they could not pay full rent or mortgage, were evicted from their home due to non-payment of rent or mortgage, could not pay the full amount of their utilities bill, needed to go to a doctor or a hospital but could not afford it, had a telephone service disconnected due to nonpayment, had electricity or gas service turned off, or heating oil not delivered, in the previous 12 months. In addition, the measure of material hardship includes information on whether the respondent received free food or meals in the past 12 months. The sum of these responses (with "yes" answers indicated by a 1 and "no" answers indicated by a 0), comprise a material hardship index ranging from 0 to 7. We examine incarceration's effects on this index at the five-year follow-up survey.

Incarceration

Our key predictor, fathers' incarceration, is based on multiple sources within the Fragile Families data. It is well known that individuals under-report illegal and stigmatizing behavior (Groves 2004), and there is also some direct evidence of under-reporting of incarceration (Golub et al. 2002). We therefore supplement fathers' self-reports of incarceration with reports by their partners, as well as "disposition data" from the survey contractors and indirect reports from both parents (see Geller et al. 2010 for a detailed discussion of the measurement of incarceration in the FFCWB study). Our

analysis focuses on two measures of incarceration, both based on whether any of the data (self-reports, disposition data, partner-reports, or indirect reports) indicate that the father has been incarcerated. The first measure indicates whether the father has ever been incarcerated by the time his child is five years old, and the second indicates whether he was incarcerated during the interval between the 3-year and the 5-year follow-up interviews.

Maternal Resource Management

One of the important distinctions between material hardship and other forms of financial instability is that while financial measures capture the level of resources available to a household, consumption-based measures such as material hardship also reflect a family's ability to manage available resources. We therefore consider several maternal characteristics that may affect their decision-making ability, including mothers' cognitive ability and impulsivity, (Frederick, 2005; Fagerlin, Ubel, Smith and Zikmund-Fisher, 2007), as well as substance use and mental health problems, which may drain family resources, and otherwise affect her ability to manage resources (Sullivan et al., 2008). Finally, we include controls for mothers' social ties, which may provide emotional support, or some financial backing, at a time of need (Sullivan et al., 2008). In particular, we measure the availability of credit or loans from family or friends, and mothers' frequency of attendance at religious services.

Other Covariates

To avoid the confounding of incarceration effects with the effects of other social factors, we examine several other dimensions on which families facing a fathers' incarceration are likely to differ from their counterparts. We identify a number of

demographic characteristics related to both the risk of incarceration and material hardship, including each parent's age, race/ethnicity, nativity, and family history (i.e., whether they were living with their biological parents at age 15). We also consider socioeconomic factors such as parents' education and employment status, as well as family characteristics, such as parents' relationship status (married vs. cohabiting vs. nonresident), and whether either parent has children with another partner. Marriage has been identified as a protective factor against both criminal behavior (Sampson and Laub 1990), and material hardship (Mayers and Jencks, 1989), while multiple partner fertility has been associated with both incarceration and a reduction in fathers' financial contributions (Geller, Garfinkel and Western forthcoming).

Sample Description

Table 1 provides a description of our study sample. The first column describes the full sample, the second describes families whose fathers experienced incarceration by the time of the five-year follow-up interview, and the third describes families whose fathers have never been incarcerated. The first rows of Table 1 suggest that families whose fathers have an incarceration history experience more hardship and are much more likely to be in poverty than families whose fathers were never incarcerated. The rest of the rows suggest that the mothers and fathers in the two groups of families differ in many other ways, which may increase hardship even in the absence of incarceration¹. Mothers in families whose fathers have experienced incarceration are much younger, less educated, in poorer health, more likely to use drugs and alcohol and more likely to suffer depression or anxiety. They are also less likely to be employed, less likely to have access to a checking account or a credit card, and less likely to be able to get a loan of \$200.

¹ Similar patterns were found in the comparison of families of fathers who were incarcerated between the year 3 and year 5 follow-up interviews (results not shown), with the exception of mothers' immigrant status and frequency of attending religious services.

Fathers in those families are more likely to be of a different ethnic group than the mother and to have children with other women by the time the focal child is three years old. Both parents in these families are much more likely to be impulsive and score lower on tests of cognitive ability than their counterparts in families whose fathers were never incarcerated. Differences between the two groups were, with few exceptions, statistically significant², and suggest the need for multivariate analysis to isolate the effects of incarceration on hardship.

Modeling Strategy

Basic Estimation

To identify the effects of paternal incarceration on material hardship, we begin by estimating a series of negative binomial regression models, which test differences between families whose fathers have an incarceration history and those who have not. We exclude families with maternal incarceration histories from all analyses³. We first we use a cross-sectional bivariate model to estimate the unadjusted relationship between paternal incarceration history and family's experience of hardship when the child is 5 year old.

To increase the likelihood that observed relationships represent causal effects, we next focus specifically on incarceration spells in the interval between the 3-year and the 5-year follow-up interviews, which allows the examination of family conditions before and after an incarceration spell. We start with a bivariate model and progressively add more covariates to reduce the likelihood that these differences are caused by other observable family characteristics. In our third model we add controls for parents' baseline

² Father of a different race/ethnicity group and father has higher education than mother were not statistically significant different between the ever incarcerated and never incarcerated groups.

³ Results in models which include mothers with incarceration history (available upon request) were very similar. If anything, the coefficients in models excluding mothers with incarceration history are slightly larger.

demographic and socioeconomic characteristics that might be associated with both incarceration and material hardship. In the fourth model we add those predictors that measure a mother's ability to manage her family's resources and her social networks. These measures, including information about her mental health, her scores on cognitive and impulsivity tests, her family history, and her reported access to loans and frequency of attendance at religious services, are unobserved in most datasets examining either incarceration or family wellbeing. Including them in the models helps us not only to isolate the effect of paternal incarceration from that of mothers' long-standing ability to manage resources, but to better understand the role of factors beyond income on the experience of hardship. In the fifth model, in addition to the predictors from previous models, we control for hardship reported at the time of 3-year interview. Examining family hardship before and after a paternal incarceration, particularly when compared to hardship levels of families whose fathers were not incarcerated, increases the likelihood that observed changes in hardship following a father's incarceration are caused by the incarceration experience itself rather than pre-incarceration family circumstances.

Finally, we estimate a model that controls for family fixed effects, allowing us to examine the within-family changes in hardship following a paternal incarceration. The fixed effects model examines within-family changes, which eliminates the influence of unobserved heterogeneity between families, and serves as a strict test of causality. While fixed effects estimates may also suffer from omitted variable bias, particularly if unmeasured changes in family circumstance between years 3 and 5 cause both incarceration and a change in hardship levels, these models eliminate the vast majority of threats to causal inference.

Further Tests

We further examine the plausibility of a causal relationship between incarceration and family hardship by testing mechanisms through which paternal incarceration may affect family hardship. We hypothesize that incarceration increases hardship not only by reducing family income, but also by increasing expenses, and compromising mothers' ability to manage household resources. We test this by re-estimating our lagged dependent variable model with an additional control for household income-to-poverty ratios at the five-year follow-up. An insignificant incarceration coefficient in this model would suggest that at equal levels of household income, father incarceration history is unrelated to material hardship. Conversely, a significant incarceration coefficient would suggest that, as hypothesized, incarceration is tied to factors that influence material hardship, beyond household income.

We also hypothesize, given the Geller, Garfinkel, and Western (forthcoming) finding that resident fathers contribute more to family finances, that the incarceration of a resident father would represent a greater hardship than the incarceration of a father living apart from his children. We thus estimate a model examining the interaction between father incarceration and father residence, and anticipate that the effects of incarceration will be stronger for families whose fathers were resident at some point before year 3.

Finally, given the stigma and added expenses associated with incarceration, we hypothesize that incarceration presents a greater risk of family hardship than do other form of father absence. To test this hypothesis, we re-estimate our models to compare families whose fathers had been incarcerated in the interval between years 3 and 5 with families whose fathers were absent for other reasons, as well as families whose fathers were consistently resident during the same time period.

Sensitivity Analyses

To test the robustness of our findings to alternate estimation strategies, we perform a propensity score analysis. Like regression analysis, propensity scores allow the isolation of the relationship between incarceration and material hardship from the effects of observable confounding characteristics (Rosenbaum and Rubin, 1983); however, propensity scores offer a more flexible method of assessing treatment effects, are less dependent on model form, and restrict comparisons to individuals who share similar observed characteristics. Appendix A presents details of the propensity score estimation.

Finally, we examine the possibility of reverse causality between paternal incarceration and material hardship. As noted earlier, material hardship may lead a father to engage in illegal activity to supplement family income, and result in his incarceration. We test the likelihood of this with a “falsification” model predicting family hardship at year 3 with father’s incarceration status in the interval between the year 3 and 5 follow-up interviews. The temporal ordering of hardship and incarceration in this model precludes a causal relationship between incarceration and prior hardship; a significant “effect” of incarceration in this model would therefore suggest a relationship driven by selection or reverse causality. On the other hand, a null relationship in the falsification model would strengthen our confidence that relationships observed earlier actually reflected a causal relationship.

Results

Estimating Incarceration’s Effects

Table 2 presents factor change coefficients from the negative binomial regression models predicting a family’s experience of material hardship with father’s incarceration history. The analysis indicates that families whose fathers have a history of incarceration are more likely to experience material hardship. As suggested by Table 1, the cross-

section bivariate model in Table 2 shows families whose fathers had been incarcerated experience 76% more hardship than the comparison sample. Focusing on the more limited examination of incarceration in the two year interval between years 3 and 5, the bivariate model suggests that the expected hardship count is 72% higher for families of incarcerated fathers, and is strongly significant. The incorporation of more predictors in the next two models gradually reduces the relationship between father's incarceration and his family's experience of hardship. Nonetheless, even when controlling for the full complement of observable covariates, the expected hardship count remains statistically significant and 27% higher than that of families whose fathers were never incarcerated.

Adding a control for hardship at year 3 (prior to the most recent spell of incarceration) in the fifth column, the expected count of hardship at year 5 is reduced by additional 8 percentage points, suggesting that families of incarcerated men may be economically disadvantaged even prior to incarceration. However, the relationship between incarceration and hardship remains positive and statistically significant, strengthening our confidence that the relationship between paternal incarceration and family's material hardship is not driven by unobserved heterogeneity.

Results from individual fixed-effects models, which focus on within-family changes, are presented in the last column of Table 2. These estimates further strengthen our confidence in a causal relationship between father incarceration and family material hardship, and suggest that fathers' incarceration in the 2 years interval prior to their child's fifth birthday substantially increases their families' experience of hardship. Families experiencing paternal incarceration during this time period experience a 37% increase in their hardship levels.

Other predictors in Models 1-5 suggest additional circumstances that lead to hardship among families of the incarcerated. Families whose parents have been

cohabiting at the time of baseline experience significantly higher hardship than families of married couples. The experience of hardship is also significantly stronger among families whose mothers score higher on the impulsivity scale, have a mental health disorder, or have a drug or alcohol problem. These findings suggest that material hardship may reflect poor personal management skills as well as inadequate resources. As expected, good physical health and employment are negatively tied to material hardship. Mothers who lived with both of their biological parents at age 15 also report less hardship though the coefficient is statistically significant only in some of the models. Having a college degree or higher education reduces the experience of hardship, but surprisingly mothers who completed some college are more likely to report hardship than mothers who completed only high school⁴.

Families whose father or mother has children with other partners by the time their child is three years old, experience greater hardship when their child is 5, suggesting that instability in relationships and family structure may contribute to hardship. Also, having access to a loan, even as small as \$200, when needed, and to a credit card significantly decreases the experience of material hardship for families of ever incarcerated.

Finally, the experience of hardship varies across cities, with greater hardship observed in cities with high costs of living (results not shown). This suggests that measures of hardship reflect differences in cost-of-living, which are not picked up by conventional measures of poverty.

Further Tests

We next test the extent to which the relationship between incarceration and hardship reflects our entering hypotheses. The first column of Table 3 replicates the

⁴ The effect was similar in models controlling for mothers' education attainment at the time their children were three years old.

findings in the fifth column of Table 2, presenting the relationship between incarceration and hardship with complete observable controls. The next column shows the extent to which incarceration is tied to family hardship beyond its relationship with poverty, and the third column tests the extent to which estimated effects are concentrated among families where parents were coresident before incarceration. The addition of income-to-poverty ratios in the second column of Table 3 reduces the observed effect by 3 percentage points (from 1.19 to 1.16), though the relationship remains substantial and statistically significant. This suggests that incarceration's effect on hardship comes in part through an increase in family poverty, but that the bulk of its effects come through other mechanisms. The third column of Table 3, and the interaction between incarceration and pre-incarceration coresidence, suggests that observed effects vary significantly by families' pre-incarceration living arrangements. The incarceration coefficient, representing the effect on families whose fathers had never lived with the focal child, decreases substantially and is no longer significant, while the interaction coefficient, representing the effects of incarceration on the ever-cohabited group, is large and statistically significant. These results support our hypothesis that resident fathers' involvement with their families provides support beyond financial contributions, both of which are lost upon incarceration.

To further understand the effect of a father's incarceration on his family's material well-being, we compare families whose fathers had an incarceration incident in the interval between years 3 and 5 to families whose fathers were absent for other reasons and to families whose fathers were consistently resident during the same time period. Results (presented in Table 4) suggest that families whose fathers' absence was for reasons other than incarceration also experience elevated levels of hardship as compared to families whose fathers were residing in the household throughout the period.

However, the estimated effect is much larger for families of incarcerated fathers, and the difference between the incarceration and absence coefficients is statistically significant ($P < .01$). The difference remains large and statistically significant even when controlling for mothers' ability to manage their resources and for their social networks and for income-to-poverty ratio, implying that incarceration may increase family hardship by a greater extent than does other father absence.

Sensitivity Analysis

The results presented in Table 2 are robust to an alternative model specification. As shown in Appendix A (Table A2), our propensity score model, like the regression analysis, suggests that paternal incarceration increases material hardship children and their families. The material hardship experienced by families whose fathers have an incarceration history is predicted to be a statistically significant 0.24 units higher on the material hardship index than the hardship levels of the control group (families whose fathers were not incarcerated) using a difference in means approach, and 0.22 units higher using a regression-adjusted matched estimate.

Falsification tests also provide no evidence of reverse causality. While incarceration between year 3 and 5 significantly affects hardship at year 5, the falsification test (also presented in Appendix A, Table A2) shows that hardship at year 3 is not significantly predicted by incarceration that occurred in the following two years, further suggesting that observed differences reflect a causal relationship, rather than unobserved selection.

Summary of Findings

Our findings suggest that paternal incarceration has significant and damaging consequences for families that are left behind. A series of cross-sectional, longitudinal, and individual fixed-effects regression models suggest that a father's incarceration history is associated with his family's material hardship, and that this hardship is unlikely to be driven by other family characteristics. The effect decreases but remains statistically significant when controlling for indicators of mothers' ability to manage resources. Indicators of compromised ability to manage, (e.g. mothers' mental health problems, impulsivity and substance use), are positively and significantly associated with hardship suggesting that material hardship may result from poor personal management skills as well as lack of economic resources.

This hypothesis is further supported by the models including household income-to-poverty ratios. The significant relationship between incarceration and hardship, even after controlling for post-incarceration income, suggests that father incarceration can contribute to hardship not only by increasing poverty, but also by increasing the financial burden on families or compromising mothers' ability to manage household resources. This disruption is limited, however, to families whose fathers have been involved with the household since the child's birth.

Additionally, our findings suggest that access to credit and loans are negatively associated with hardship. Also, the experience of hardship varies across cities suggesting that there may be a need to adjust hardship measures to cost of living considerations.

Limitations and Implications for Research and Policy

The results presented suggest that material hardship is significantly more intense for families experiencing a paternal incarceration, and that this relationship is unlikely to be explained by unobserved heterogeneity between the families that do and do not

experience a paternal incarceration. However, threats to causal inference remain. As noted, even a fixed effects model, which focuses on changes in within-family hardship following a father's incarceration, may produce biased results if unobserved family changes increase both the likelihood of incarceration and the experience of hardship. For example, changes in local labor market conditions may lead to a father's job loss, which has the potential to both expose his family to hardship, and drive him to earn money illegally, increasing his risk of incarceration. Fixed effects estimates that do not reflect these changes will misstate the effects of incarceration on family material hardship.

Nonetheless, our findings strongly suggest that families are adversely affected by the incarceration of a father, and that this effect begs attention from policymakers and social service providers. The hardships experienced by the families of incarcerated men underscore the importance of social services provision. Incarceration may represent a serious disruption in family life, and social service involvement can help ameliorate hardship to families by ensuring continuity of resources.

The concentration of effects among families with previously resident fathers suggests that incarceration presents a major disruption for family life. Comfort (2008) and Hairston (1998) cite the cost of communication as a major challenge to maintaining family ties. One strategy to remedy this would be to reduce the costs of phone calls between inmates and their families. Some efforts have been made to reduce these costs; for example, some work-release programs use calling cards as a reward for good behavior among participants. The opportunity for incarcerated individuals to call home using a card, rather than calling collect, reduces the financial burden on family members outside of jail and also provides prisoners with a source of pride and incentive toward good behavior. New York State has also recently announced efforts to reduce the monthly financial burden of collect calls between inmates and their families (which could be as

much as \$300 to \$400) by lowering the rates of such calls (NY Times, November 28, 2009).

Finally, the increased experience of material hardship among families of incarcerated men represents a serious cost of incarceration, and the extent to which this cost is offset by public safety benefits is unclear. Future research examining the effectiveness of incarceration policies must consider the increase in family material hardship when evaluating the costs and benefits of incarceration policy in the United States.

Table 1 – Sample Means

	Full Sample	Ever-Incarcerated	Never-Incarcerated
Ever Incarcerated	.47	1	0
Incarcerated between Y3-Y5	.21	.46***	0
Material Hardship at 5-yr	.80	1.04***	.59
	[1.25]	[1.41]	[1.09]
Any material hardship at 5-yr	.41	.52***	.31
Income-to-poverty ratio			
<50% of poverty line	.20	.29***	.12
50-99% of poverty line	.19	.23***	.15
100-200% of poverty line	.27	.29***	.24
200-300% of poverty line	.14	.11***	.17
>300% of poverty line	.21	.30***	.12
Relationship Status			
Married	.25	.08***	.42
Cohabiting	.36	.39***	.33
Non-resident	.37	.53***	.24
Mother’s Characteristics			
Age at baseline	25.16	23.22***	26.85
	[6.04]	[5.25]	[6.19]
Race			
White non-Hispanic	.22	.17***	.28
Black non-Hispanic	.48	.59***	.39
Hispanic	.26	.23***	.28
Other race	.04	.02***	.05
Education			
Less than high school	.32	.41***	.23
High school	.31	.35***	.28
Some college	.25	.22***	.28
College or more	.12	.02***	.20
Immigrant	.15	.08***	.21
Self-reported health	.67	.64***	.70
Employment status	.39	.34***	.44
Impulsivity score	1.39	1.62***	1.18
	[1.64]	[1.73]	[1.52]
Cognitive score	6.54	6.16***	6.90
	[2.91]	[2.89]	[2.88]
Attends religious services a few times per month	.39	.33***	.44
Lived with both parents at age 15	.43	.33	.52
Multi-partner fertility (3Y)	.39	.49***	.30
Mother Anxious/Depressed (3Y)	.12	.14***	.09
Substance use (1Y)	.06	.08***	.05
Father’s Characteristics			
Father 5+ years older than mother	.21	.20	.21
Parents not of same race	.15	.16***	.13

Father more educated than mother	.23	.23	.23
Immigrant	.13	.06***	.19
Impulsivity score	1.02	1.16***	.90
	[1.62]	[1.78]	[1.45]
Cognitive score	5.50	4.67***	6.23
	[3.48]	[3.51]	[3.27]
Multi-partner fertility (3Y)	.32	.40***	.24
Lived with both parents at age 15	.39	.26***	.50
Observations	3388	1593	1765

Standard deviations in brackets

Table 2 - Factor Change Coefficients from Negative Binomial Event-Count Models of Paternal Incarceration Effect on Material Hardship

	Cross Section Binary	Y3-Y5 Binary	Y3-Y5 Dad & Mom Base Demog.	Y3-Y5 Maternal Resource Mgmt.	Lagged DV Y3-Y5 Maternal Resource Mgmt.	Individ ual Fixed Effects
Ever Incarcerated	1.76*** [0.10]					
Incarcerated between Y3 and Y5		1.72*** [0.12]	1.46*** [0.10]	1.27*** [0.09]	1.19*** [0.08]	1.37** [0.20]
Material hardship at year 3					1.49*** [0.03]	
Relationship Status						
Cohabiting			1.59*** [0.13]	1.41*** [0.12]	1.32*** [0.11]	
Non-resident			1.36*** [0.12]	1.19* [0.11]	1.13 [0.10]	
Mother's Characteristic						
Age at baseline			1.00 [0.01]	1.00 [0.01]	1.00 [0.01]	
Race						
Black non-Hispanic			1.17* [0.10]	1.11 [0.10]	1.15 [0.10]	
Hispanic			0.99 [0.10]	0.97 [0.10]	0.97 [0.09]	
Other race			1.27 [0.21]	1.18 [0.20]	1.07 [0.18]	
Education						
< High School			1.07 [0.07]	0.99 [0.07]	1.00 [0.07]	
Some College			1.17** [0.08]	1.22*** [0.09]	1.13* [0.08]	
College of more			0.62*** [0.08]	0.76** [0.10]	0.76** [0.10]	
Immigrant			0.86 [0.09]	0.94 [0.10]	0.97 [0.10]	
Self-reported health			0.78*** [0.04]	0.83*** [0.05]	0.83*** [0.04]	
Employment status			0.86** [0.05]	0.89* [0.05]	0.90* [0.05]	
Impulsivity score				1.07*** [0.02]	1.05*** [0.02]	
Cognitive score				1.03** [0.01]	1.02 [0.01]	
Attends religious services				0.97	0.98	

a few times per month				[0.05]	[0.05]	
Live with both parents at age 15				0.89**	0.93	
Multi-partner fertility				[0.05]	[0.05]	
Anxious/Depressed (1Y)				1.17***	1.09	
Substance use (1Y)				[0.07]	[0.06]	
Has checking account (3Y)				1.62***	1.31***	
Could get a \$200 loan (3Y)				[0.12]	[0.09]	
Has a credit card (3Y)				1.25**	1.23**	
Father's Characteristics				[0.13]	[0.12]	
Immigrant				1.02	1.01	
5+ years older than mother				[0.07]	[0.06]	
Parents not of same race				0.68***	0.85**	
Father more educated than mother				[0.05]	[0.06]	
Impulsivity score				0.80***	0.92	
Cognitive score				[0.05]	[0.06]	
Multi-partner fertility				0.93	0.96	
Lived with both parents at age 15				[0.10]	[0.11]	
Observations	3793	3793	3793	3793	3499	1578

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 - Factor Change Coefficients from Negative Binomial Event-Count Models of Paternal Incarceration Effect on Material Hardship (All Models in Table 3 are Lagged Dependent Variable)

	Y3-Y5 Maternal Resource Management	Y3-Y5 W/Poverty	Y3-Y5 W/Interaction
Incarcerated between Y3 and Y5	1.19*** [0.08]	1.16** [0.08]	1.03 [0.09]
Incarcerated between Y3 and Y5 X Ever cohabiting			1.23* [0.14]
Income-to-poverty ratio			
<50% of poverty line		2.39*** [0.27]	2.39*** [0.27]
50-99% of poverty line		2.74*** [0.29]	2.72*** [0.29]
100-200% of poverty line		2.18*** [0.22]	2.18*** [0.22]
200-300% of poverty line		1.73*** [0.19]	1.72*** [0.19]
Material hardship at year 3	1.49*** [0.03]	1.48*** [0.03]	1.49*** [0.03]
Observations	3499	3499	3499

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 - Factor Change Coefficients from Negative Binomial Event-Count Models Comparing Effect of Paternal Incarceration to Other Fathers Absence on Material Hardship

	Mom & Dad Base Demographic Characteristics	Maternal Resource Management	With Poverty Categories
Father Incarceration between Y3 and Y5	1.77***	1.48***	1.38***
	[0.14]	[0.12]	[0.11]
Other Father Absence between Y3 and Y5	1.38***	1.27***	1.19**
	[0.10]	[0.09]	[0.08]
P-value Comparison	P= 0.00 ***	P= 0.04**	P= 0.03**

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

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Appendix A: Propensity Score Analysis

To compare the hardship levels of families whose fathers were incarcerated, and comparable families with no paternal incarceration, we estimate a probit model predicting father incarceration between years 3 and 5 with a combination of the observed pre-treatment covariates, as well as the level of material hardship as reported at the third-year survey (i.e. before the period of incarceration would be observed), and a series of city indicators. Following the example of D’Agostino and Rubin (2000), samples are balanced on missing data indicators as well as substantive covariates. Table A1 presents results from the Probit estimation.

We then use a nearest-neighbor (with replacement) matching algorithm to restrict our analysis sample to families experiencing a paternal incarceration, and their counterparts with no paternal incarceration between years 3 and 5, but comparable observed likelihood of experiencing one. We achieve a balance of the covariates in our model with the exception of whether the father is more educated than the mother, mother’s substance use, frequency of religious services attendance and the missing data indicator for father’s cognitive ability (results available upon request.)

Finally, to estimate the effects of fathers’ incarceration and family material hardship, we compute the average level of hardship among both the treated and matched comparison samples. The difference between the two subsamples represents the effect of incarceration on families likely to experience a father’s incarceration, or the “effect of the treatment on the treated”.

Table A1: Probit Coefficients Predicting Fathers’ Incarceration, Years 3-5

	Probit coefficients
Material hardship at year 3	0.08 [0.02]***
Parents cohabiting at baseline	0.25 [0.11]**
Parents non residents at baseline	0.54

Father is an immigrant	0.01	[0.11]***
Father 5+ years older than mother	0.13	[0.13]
Fathers age at baseline	-0.02	[0.10]
Mother and father of difference race	0.17	[0.01]**
Father more educated than mother	-0.24	[0.09]*
Father's impulsivity score	0.06	[0.30]
Father's cognitive score	-0.03	[0.02]***
Father lived with both parents at age 15	-0.05	[0.01]***
Mothers age at baseline	-0.12	[0.07]
Mother's age squared	0.00	[0.04]***
Mother Black non-Hispanic	0.22	[0.00]**
Mother Hispanic	-0.12	[0.10]**
Mother other race	0.00	[0.12]
Mother < HS education	0.59	[0.2]
Mother some college education	0.44	[0.21]***
Mother college or more	0.34	[0.20]**
Mother is an immigrant	-0.41	[0.19]*
Mother's self-reported health	0.09	[0.14]***
Mother employed at baseline	0.04	[0.06]
Mother's substance use at year 1	0.18	[0.07]
Mother's impulsivity score	0.07	[0.11]
Mother's cognitive score	-0.01	[0.02]***
Mother attends religious services a few times per month	-0.10	[0.01]
Mother lived with both parents at age 15	-0.09	[0.06]

Mother anxious/depressed at Y1	-4.49
	[0]
Austin	0.10
	[0.16]
Detroit	0.05
	[0.16]
Newark	-0.15
	[0.16]
Philadelphia	-0.09
	[0.16]
Richmond	-0.08
	[0.15]
Corpus Christi	0.24
	[0.14]
Indianapolis	-0.08
	[0.16]
Milwaukee	0.14
	[0.16]
New York City	0.11
	[0.15]
San Jose	-0.24
	[0.18]
Boston	0.15
	[0.18]
Nashville	0.33
	[0.23]
Chicago	0.34
	[0.20]*
Jackson	0.17
	[0.22]
Toledo	-0.18
	[0.25]
San Antonio	0.40
	[0.22]*
Pittsburgh	0.35
	[0.22]
Norfolk	0.33
	[0.22]
Mother Anxious/Depressed missing	0.04
	[0.14]
Mother's race missing	-0.47
	[0.68]
Mother's employment missing	0.16
	[0.18]
Father's cognitive score missing	-0.00
	[0.13]**
Father's impulsivity score missing	0.32
	[0.10]***
Father's nativity missing	0.23
	[0.83]

Mother lived with both her biological parents at age 15 missing	0.03
	[0.30]
Mother attends religious services a few times per month missing	-0.11
	[0.51]
Father 5+ years older missing	-0.05
	[0.10]
Father's education missing	0.32
	[0.19]*
Father lived with both her biological parents at age 15 missing	0.33
	[0.39]
Father more educated than mother X Father's age	-0.00
	[0.01]
Mother Anxious/Depressed X Mother's age	-0.01
	[0.01]
Mother Anxious/Depressed X Cohabiting at Baseline	0.20
	[0.29]
Mother Anxious/Depressed X Non-Resident at Baseline	-0.26
	[0.29]
Mother Anxious/Depressed X Mother <HS education	4.65
	[0.50]***
Mother Anxious/Depressed X Mother Some College	5.06
	[0.52]***
Mother Anxious/Depressed X Mother Completed College	5.04
	[0.52]***
Has checking account (3Y)	-0.10
	[0.07]
Could get a \$200 loan (3Y)	-0.09
	[0.08]
Has a credit card (3Y)	-0.28
	[0.07]***
Could get a \$200 loan (3Y)Can get a Loan - missing	0.38
	[0.68]
Constant	0.16
	[0.54]
Observations	3282

Standard errors in brackets

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

Table A2 – Sensitivity Analyses

	Lagged DV	Propensity Score - Difference in Means	Regression-Adjusted Matched Estimate	Falsification Test (Hardship at Y3)
Incarceration between Y3 and Y5	1.16**	0.24***	0.22***	1.11
	[0.08]	[0.00]	[0.00]	[0.07]