Positive, Negative, or Null? The Effects of Maternal Incarceration on Children's Behavioral Problems

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ABSTRACT

As maternal incarceration may help, harm, or have no effect on child wellbeing, increases in the risk of maternal imprisonment are relevant to scholars interested in both mass imprisonment and the forces that shape inequalities in child wellbeing. Unfortunately, with the exception of a few rigorous studies on educational and birth outcomes, little research has considered the effect of maternal incarceration on child wellbeing after adjusting for differences between children who do and do not experience maternal incarceration. We use data from the Fragile Families and Child Wellbeing Study to consider the effects of maternal incarceration on 21 caregiver- and teacher-reported behavioral problems among nine-year-old children. Results show that, after adjusting for confounders, maternal incarceration is positively and significantly associated with just 1 behavioral problem and negatively and significantly associated with just 1 behavioral problem. In models considering both maternal and paternal incarceration, compared to children with neither parent incarcerated, children with only a father incarcerated have significantly more behavioral problems on 17 of 21 outcomes and children with only a mother incarcerated have significantly more behavioral problems on 1 of 21 outcomes. Taken together, our results suggest the average effects of maternal incarceration on children's behavioral problems are null.

INTRODUCTION AND BACKGROUND

Over the course of the American prison boom, imprisonment has become a common stage in the life course of African-American men with low levels of education (Pettit and Western 2004), causing paternal imprisonment to become common for the children of these marginalized men (Wildeman 2009). As a result of dramatic increases in paternal imprisonment, scholars have become interested in the consequences of paternal incarceration for child wellbeing, finding paternal incarceration has a range of detrimental effects on children, adolescents, and adults (Hagan and Dinovitzer 1999; Murray and Farrington 2008; Wildeman and Western 2010).[2]

The emphasis on the effects of *paternal* imprisonment on child wellbeing is warranted given that the cumulative risk of paternal imprisonment is far greater than the risk of maternal imprisonment (Wildeman 2009). But for much of the prison boom, *relative* increases in imprisonment have been far greater for women than for men (e.g., Blumstein and Beck 1999; Kruttschnitt 2010). These dramatic relative increases have led to impressive growth in the risk of maternal imprisonment for some groups of children. For example, 3.3 percent of African-American children—and 5.0 percent of African-American children whose mothers dropped out of high school—can expect to experience maternal imprisonment by age 14. Although these risks are dwarfed by the risks of paternal imprisonment for comparable children, they are still high enough that they would have been unthinkable in the recent past (Wildeman 2009:271, 273).

Considering the effects of maternal incarceration on children also merits attention because, as documented in a recent review (Johnson and Easterling 2012), there are compelling theoretical reasons to expect maternal incarceration is detrimental, beneficial, or inconsequential

[2] We use causal language throughout even though we lack an exogenous shock in maternal incarceration. We do this because our results (described later) provide a strong case that maternal incarceration has no effect on children's behavioral problems, as the association becomes statistically insignificant in most models after adjusting for basic demographic and socioeconomic characteristics. Thus, we use causal language to highlight effects we do not find.

for children. The uncertainty surrounding these effects places them in contradistinction to the effects of paternal incarceration, where researchers are slowly reaching a consensus that the effects are, on average, negative, even if paternal incarceration may enhance child wellbeing in extreme circumstances (Wildeman, Wakefield, and Turney 2013). For instance, as with paternal incarceration, maternal incarceration could be detrimental to children by its exacerbation of socioeconomic and emotional stress (Kruttschnitt 2010). And it is possible these effects are larger than those of paternal incarceration because more incarcerated mothers than fathers live with their children immediately prior to incarceration (Mumola 2000). Yet despite compelling reasons to expect maternal incarceration to have detrimental consequences for children, maybe even more detrimental than those of paternal incarceration, there are at least equally compelling reasons to expect the effects of maternal incarceration on children to be null or even positive. Given that women, compared to men, are a dramatically more select population on multiple markers of disadvantage (e.g., low socioeconomic status, a propensity for substance abuse, and a history of homelessness), maternal incarceration might have null effects on children (e.g., Giordano 2010:147-150; Johnson and Easterling 2012; Sampson 2011). Further, it is not unthinkable that maternal incarceration would enhance child wellbeing, as some accounts of prisoners paint a portrait of women who put their children in the face of unthinkable harm, often driven by their addiction (e.g., Siegel 2011:76-93; Turanovic, Rodriguez, and Pratt 2012).[3]

Despite compelling reasons to believe maternal incarceration is detrimental, beneficial, or inconsequential for child wellbeing, little research considers these associations after adjusting for the vast differences between children with and without incarcerated mothers. Indeed, much research examining the linkages between maternal incarceration and child wellbeing relies on

[3] This argument differs significantly from that of research on the consequences of paternal incarceration for children, where researchers have argued and shown empirically that it is only in extreme circumstances (such as when the father was abusive) that paternal incarceration is associated with benefits to children (e.g., Wildeman 2010, 2012).

qualitative data (e.g., Arditti 2012; Siegel 2011) or samples too small to rigorously test for causal effects (e.g., Huebner and Gustafson 2007). Additionally, considerable research examines factors that moderate the association between maternal incarceration and child wellbeing (e.g., Poehlmann 2005) or heterogeneity in the effects of maternal incarceration on families (e.g., Turanovic et al. 2012) rather than isolating average causal effects. Exceptions to this lacuna consider the effects of maternal incarceration on the educational (Cho 2009a, 2009b; Dallaire, Ciccone, and Wilson 2010; Hagan and Foster 2012) and birth outcomes of children (e.g., Clarke and Adashi 2011). Yet although this research uses high-quality data and rigorous analytic tests, these findings provide little closure on how maternal incarceration affects children, as they find a combination of positive, negative, and null effects that depend on the outcome and sample. Thus, based on the limited existing research, it is unclear how maternal incarceration affects children.

In this paper, we extend the literature on maternal incarceration and child wellbeing to provide greater clarity on whether maternal incarceration is, *on average*, detrimental, beneficial, or inconsequential for children. We use data from the Fragile Families and Child Wellbeing Study, a sample of children born in urban areas in 1998-2000, to consider the effect of maternal incarceration on 21 caregiver- and teacher-reported behavioral problems among nine-year-old children. The data we use, the range of outcomes we consider, and the extensive series of rigorous tests we conduct advance the literature on the consequences of maternal incarceration for children, as well as the broader literature on the collateral consequences of incarceration and the various factors that contribute to social inequalities in child wellbeing more broadly.

The Fragile Families data are well-suited to considering the consequences of maternal incarceration for children for four reasons. First, a larger number of children experienced maternal incarceration at some point between ages one and nine—291 of 3,330 (8.1%) children

with caregiver-reported outcomes and 178 of 2,173 (8.2%) children with teacher-reported outcomes—than have in previous research on this topic. Huebner and Gustafson's (2007:286) analysis of the children of the National Longitudinal Study of Youth 1979 (NLSY79), for instance, relied on 26 mothers (2.1% of their analytic sample) who were ever incarcerated, and Hagan and Foster's (2012:48) analysis of the National Longitudinal Study of Adolescent Health (Add Health) relied on about 50 mothers (1.0% of their analytic sample) who experienced incarceration.[4] Second, the Fragile Families data also include extensive information on *paternal* incarceration (e.g., Geller et al. 2012; Sugie 2012; Wildeman 2010), making it possible to better disentangle the differential effects of maternal and paternal incarceration. Third, they include extensive measures of paternal and maternal characteristics, including prior incarceration, substance abuse, and self-control, making it possible to fairly confidently rule out a spurious association. Finally, the data include extensive, well-established measures of children's behavioral problems at age nine. Reports come from both primary caregivers and teachers, which diminishes concerns about common reporter bias (by including reports from someone other than the primary caregiver, who was one of the people whose reports were also used to measure parental incarceration), as well as provides insight into how children behave in multiple contexts.

This benefit bears more extensive discussion, as it relates directly to another contribution of our analysis. Of the relatively scant research that estimates the average effects of maternal incarceration on children, most considers only a fairly narrow range of outcomes including birth (e.g., Clarke and Adashi 2011), educational (e.g., Cho 2009a, 2009b; Hagan and Foster 2012), or criminal justice (e.g., Huebner and Gustafson 2007) outcomes, making it difficult to make overarching statements about how maternal incarceration affects children. Given that childhood

[4] In Hagan and Foster's (2012:48) analysis, all information on the number of children who had a mother imprisoned comes from Table 1, which indicates that 1 percent of the 4,655 children in the sample experienced that event.

behavioral problems predict future outcomes such as teenage parenthood (e.g., Woodward and Fergusson 1999), educational attainment (e.g., McLeod and Kaiser 2004), labor market outcomes (e.g., Bowles et al. 2001), crime and criminal justice involvement (e.g., Sampson and Laub 1993), and mental health (e.g., Knoester 2003), our analysis lends broad insight how maternal incarceration may affect children across the life course.[5] By considering a broad range of 21 behavioral problems that predict how children will fare into adolescence and adulthood, we thus provide insight into how maternal incarceration might alter children's life course trajectories.

DATA, MEASURES, AND ANALYTIC STRATEGY

Data

Data used to test the relationship between maternal incarceration and children's behavioral problems come from the Fragile Families and Child Wellbeing Study (FFCW), a longitudinal survey of nearly 5,000 new and mostly unmarried parents in 20 U.S. cities with populations greater than 200,000 (Reichman et al. 2001). Between February 1998 and September 2000, mothers completed an in-person interview at the hospital after the birth of their child. Fathers were interviewed as soon as possible after the child's birth. Both parents were interviewed by telephone when their children were approximately one, three, five, and nine years old. When children were nine years old, researchers completed an in-home interview with the child's primary caregiver (the child's mother in 92.4% of observations). For children whose biological parents were no longer their primary caregivers, the new primary caregiver—often a grandparent, aunt, or uncle—was interviewed. The caregiver completed a booklet about the focal child's behavioral problems. Also when children were nine years old, researchers administered

[5] If there were a body of research suggesting directional effects of maternal incarceration on particular outcomes (e.g., internalizing behaviors) but not others (e.g., externalizing behaviors), such a broad test would not be warranted. But such an approach is warranted given the relative lack of knowledge concerning these effects.

an interview to a subsample (46%) of children's teachers. Response rates were relatively high throughout all interviews. Of mothers who responded to the baseline interview, 89%, 86%, 85%, and 74% participated in the one-, three-, five-, and nine-year interviews, respectively, with a non-parental caregiver reporting in some additional instances. About 69% of mothers also participated in the nine-year in-home interview, with caregivers other than mothers (such as fathers, aunts, and grandparents) sometimes reporting in the 31% of cases in which the mother did not report (Bendheim-Thoman Center for Research on Child Wellbeing 2008, 2011).

We use two different analytic samples. The first analytic sample, used to estimate children's caregiver-reported behavioral problems, includes 3,330 observations. Of the 4,898 observations in the FFCW baseline sample, we dropped the 1,096 (22%) observations that did not complete the in-home interview at the nine-year interview and an additional 472 (10%) observations with incomplete information on any of the caregiver-reported behavioral problems (described below) or maternal incarceration (described below).[6] Consistent with prior research using FFCW, differences in observed variables between the analytic and baseline samples were often small, suggesting that although nonrandom attrition by *unobserved* characteristics may be problematic, nonrandom attrition by *observed* characteristics is likely not. Nonetheless, there were some significant differences between the analytic and baseline samples, with mothers in the analytic sample more likely to be non-Hispanic Black and to have smoked during the pregnancy and less likely to be immigrants and to have completed high school. Fathers in the analytic sample were also less likely to be immigrants and to have completed high school.

[6] In a series of robustness checks, we also limited the first analytic sample to only families where at least the mother or father participated in additional survey waves beyond the baseline and the nine-year in-home interviews. Limiting the sample in this way ensures that at least one family member reported on maternal incarceration and paternal incarceration multiple times. Even in the most extreme version of this robustness check, where we limited the sample to families in which at least one parent reported at each interview, the pattern of results remained unchanged.

The second analytic sample, used to estimate teacher-reported behavioral problems, includes 2,173 observations, as we drop the 2,646 (54%) observations in which the child's teacher was not interviewed at the nine-year interview and an additional 79 (2%) observations with incomplete information on any of the 10 teacher-reported behavioral problems.[7] There are several differences between the first and second analytic samples. Children in the second analytic sample, compared to the first analytic sample, are somewhat more advantaged across a range of domains, although few of these differences are substantial. Both parents in the first analytic sample were more likely to be non-Hispanic Black and less likely to be non-Hispanic White, more likely to have not completed high school and less likely to have completed some college, more likely to live with a maternal grandmother, and less likely to be married and more likely to have no relationship with each other, and the mothers were more likely to have been incarcerated before the one-year interview ($p < .05$). Again, despite being statistically significant, all of these differences were small, suggesting nonrandom attrition on observables is minimal.[8]

In both analytic samples, relatively few observations are missing data on our key explanatory variables and control variables. We preserve these observations by producing 20 multiply imputed data sets in Stata (Royston 2007). In the imputation model, we include variables related to the research questions or to the likelihood of being missing (Allison 2002).[9]

[7] As with the first analytic sample, the pattern of results remains unchanged even when the most severe sample limitation—children who had a parent participate in each wave, representing 87% of this analytic sample—is used.
[8] Results from robustness checks that consider the effects of maternal incarceration for caregiver-reported behavioral problems using the second analytic sample differ in some ways from results using the first analytic sample. In results using the second analytic sample, maternal incarceration was associated with statistically significant *decreases* in 4 of the 11 caregiver-reported behavioral problems (aggressive, rule-breaking, externalizing, and total problems). Thus, to the degree that results from this robustness check suggest the effects of maternal incarceration on children's behavioral problems are statistically significant—as opposed to statistically insignificant, as the main results suggest throughout—they indicate that maternal incarceration decreases behavioral problems. This finding departs not only with the broader research on parental incarceration but also with research on maternal incarceration.
[9] Few observations were completely missing information on maternal incarceration, and supplementary analyses in which those cases were removed from the analysis instead of imputed led to no noteworthy differences in results.

Measures

Children's Behavioral Problems. First, we consider 11 indicators of caregiver-reported behavioral problems at age nine. These behaviors were measured by the Child Behavior Checklist /6-18 (CBCL/6-18), an established measure of behavioral problems in children (Achenbach 1992). Caregivers were asked to rate aspects of children's behaviors (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*), and these responses comprise the following measures: aggressive (α = .89), withdrawn/depressed (α = .69), anxious/depressed (α = .78), attention problems (α = .85), social problems (α = .73), rule-breaking behavior (α = .77), somatic complaints (α = .76), thought problems (α = .78), internalizing problems (α = .86), externalizing problems (α = .91), and total problems (α = .93). We average responses for each scale and standardize each to have a mean of 0 and a standard deviation of 1.[10]

In addition, we consider 10 indicators of teacher-reported behavioral problems. Four behavioral problems were measured using the Conners' Teacher Rating Scale – Revised Short form (CTRS-R:S), an established measure of child behavioral problems (Conners 2001). Teachers were asked to report on the following aspects of children's behaviors (0 = *not true/never or seldom*, 1 = *just a little true/occasionally*, 2 = *pretty much true/often or quite a bit*, 3 = *very much true/very often or very frequent*): oppositional problems (α = .94), cognitive problems/attention (α = .88), hyperactivity (α = .92), and Attention Deficit Hyperactivity Disorder (ADHD; α = .95). Six other behavioral problems were measured using the Social Skills Rating System (SSRS), another series of established measures (Gresham and Elliott 1990).

[10] As these scales are ordinal, an alternate method is to use ordered logistic regression models to consider the association between maternal incarceration and children's behavioral problems. In supplementary analyses, results using ordered logistic regression models provide substantively similar results, suggesting that model choice and the decision to standardize these measures is not driving our findings. We nonetheless use the standardized measures in conjunction with the OLS and propensity score models because it is convention to do so.

Teachers were asked to report on the following aspects of children's behaviors (0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *very often*): cooperation (α = .95), social problems (α = .89), assertion problems (α = .87), self-control problems (α = .95), internalizing problems (α = .85), and externalizing problems (α = .93).[11] Again, for teacher-reported behavioral problems, we average responses for each scale and standardize each to have a mean of 0 and a standard deviation of 1.

Incarceration. For the results presented, we generate the most expansive measure of maternal incarceration between the one- and nine-year interviews. We rely on a series of direct (e.g., the mother is currently incarcerated) and indirect (e.g., the child stopped living with the mother because she was incarcerated) measures of maternal incarceration and consider children to have experienced maternal incarceration in the last eight years if (1) neither the mother nor the father reported the mother had ever been incarcerated at the one-year interview and subsequently reported she had ever been incarcerated at the three-, five-, or nine-year interviews, (2) the primary caregiver at the nine-year interview was a non-parent, and they reported the child was placed in their care due to maternal incarceration, or (3) either the mother or father reported the mother was currently incarcerated or had been incarcerated since the last interview at the three-, five-, or nine-year interviews. Paternal incarceration was coded similarly, although different questions were asked about maternal and paternal incarceration, so the exact indicators used to construct these measures differed. About 8% of nine-year-old children in our analytic sample had a mother incarcerated between ages one and nine. Having either parent spend time in prison or jail was common for children in our analytic sample, as 31% experienced only paternal incarceration (and not maternal incarceration), 4% experienced only maternal incarceration (and not paternal incarceration), and 5% experienced both maternal and paternal incarceration.

[11] We do not estimate teacher-reported behavioral problems because the scales used are not meant to be combined to generate a global measure (Conners 2001; Gresham and Elliot 1990).

Although the measure of maternal incarceration is excellent in many regards—it is based on mother, father, and caregiver reports, uses direct and indirect measures, and is constructed through repeated interviews—this measure nonetheless has limitations. First, and most importantly, it provides no insight into the duration of maternal incarceration and, thus, considers incarceration lasting one day the same as incarceration lasting many months. Second, and relatedly, our measure does not allow us to differentiate between prison and jail incarceration, which differ significantly in terms of visitation policies and proximity to home. Finally, our expansive measure assumes all mothers who were never incarcerated at the one-year interview and subsequently reported to be ever incarcerated actually experienced incarceration since the one-year interview—even if there is no additional direct or indirect information in that regard. Although our assumption that these shifts from "never incarcerated" to "ever incarcerated" track well with recent incarceration experiences is a fair one—especially since the incarceration measures vary across parents and waves—it nonetheless merits mentioning.[12]

[12] To address this limitation, which is the only one of these limitations we can address using FFCW, we constructed a measure of maternal incarceration that considered mothers to have been incarcerated only if we had direct or indirect evidence that they were incarcerated during that period. Thus, if there was no evidence that the mother experienced incarceration since the one-year interview except that the mother's ever-incarcerated status switched from never to ever (between the one-year interview and subsequent interviews), we do not consider the mother to have been incarcerated recently. Using this measure reduced the percentage of mothers experiencing incarceration in the last eight years by half (from 8% to 4%). Using this more conservative measure substantially altered the OLS regression results. On two of the caregiver-reported outcomes, anxious and rule-breaking behaviors, maternal incarceration was associated with significantly fewer behavioral problems. But on three caregiver-reported behavioral problems and nine teacher-reported behavioral problems, maternal incarceration was associated with significantly more children's behavioral problems. Thus, had we used this more conservative measure, we would have reached different conclusions about the consequences of maternal incarceration for children's behavioral problems. Ultimately, we used the more expansive measure of maternal incarceration for two reasons. First, the more conservative measure was driven heavily by current bouts of incarceration and was therefore likely missing many, if not most, of maternal incarceration between waves, and hence providing potentially biased estimates of the effects of maternal incarceration on children's behavioral problems. Second, and more empirically, although the results from the OLS models differed markedly depending on the coding of the explanatory variable, findings did not differ greatly once propensity score models were used, which meshes well with our primary conclusions that maternal incarceration has few discernible effects on children's behavioral problems. In the kernel matching model, four of nine teacher-reported behavioral problems and zero of four caregiver-reported behavioral problems were associated with significantly more behavioral problems, suggesting many of these relationships were not robust.

Control Variables. The analyses adjust for a host of maternal, paternal, and child characteristics that may render the association between maternal incarceration and children's behavioral problems spurious. Importantly, with one exception, all controls were measured at the baseline or one-year interviews and, thus, prior to maternal incarceration. Since different information on incarceration is collected at each of the follow-up interviews, we generate a series of dummy variables indicating that both parents were missing at the one-, three-, five-, and nine-year interviews. We also adjust for the caregiver's relationship to the child (the mother, the father, and a non-parent).[13] Basic demographic characteristics of the mother and father include race (non-Hispanic Black, non-Hispanic White, Hispanic, non-Hispanic other race), immigrant status, age, and education (less than high school, high school diploma or GED, post-secondary education). We also control for additional traits of the mother: if she lived with both biological parents at age 15, income-to-poverty ratio (the ratio of the total household income to the official poverty threshold based on household size and composition, as established by the U.S. Census Bureau), material hardship (e.g., if mothers received free food or meals or borrowed money from friends or family to help pay the bills), if she resides with the child's grandmother, relationship status with the child's father (married, cohabiting, non-residential romantic relationship, no relationship), relationship quality with the child's father, relationship with a new partner, number of children in the household, and parenting stress. We also control for three characteristics of the child: gender, if the child was born low birth weight (less than 2,500 grams), and temperament (reported by the mother at the one-year interview).

Additionally, we control for a host of maternal characteristics that may be associated with selection into incarceration. We include dummy variables indicating that the mother smoked during pregnancy with the focal child and that she used drugs or drank alcohol during pregnancy

[13] Analyses in which we differentiated further among "non-parent" caregivers were substantively similar.

with the focal child. Maternal substance abuse problem is measured by an affirmative response to any of the following: (1) drinking or drugs interfered with day-to-day life, (2) drinking or drugs interfered with personal relationships, and (3) the mother sought help or was treated for drug or alcohol problems in the past year. Self-control is measured by mothers' responses to the following questions: I often say and do things without considering the consequences; I often get into trouble because I don't think before I act; I do things that may cause trouble with the law; I lie or cheat; I frequently get into fights; I don't seem to feel guilty when I misbehave ($\alpha = .86$). Higher values indicate greater self-control. Maternal self-control was ascertained at only the five-year interview (and thus is not necessarily exogenous to incarceration), but we include it as a control because it is considered stable (e.g., Gottfredson and Hirschi 1990). We also control for depression, measured by responses to the Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler et al. 1998), and prior incarceration (if the mother or father reports she was incarcerated after the baseline interview and up to and including the one-year interview).

Finally, we control for additional paternal characteristics. Specifically, we include a measure of paternal self-control ($\alpha = .89$), as well as a series of dummies indicating that the father had a substance abuse problem, engaged in domestic violence, was employed in the past week, and had ever been incarcerated by the one-year interview (including prior to baseline). The inclusion of these controls is vital because few previous studies of the effects of maternal incarceration have adjusted extensively for paternal behaviors (but see Hagan and Foster 2012).

Analytic Strategy

Our analyses proceed in four stages. In the first stage, we consider statistically significant differences in caregiver- and teacher-reported behavioral problems between two groups of

children: those who experienced maternal incarceration between ages one and nine and those who did not (Table 1). We also consider descriptive differences in these two groups across all control variables (Table 2). In Tables 1 and 2, we examine the statistical significance of the differences between children with and without mothers incarcerated in the last eight years.

In the second analytic stage, we estimate a series of ordinary least squares (OLS) regression models[14] that progressively adjust for characteristics that may alter the association between maternal incarceration and children's caregiver- (Table 3) and teacher-reported (Table 4) behavioral problems.[15] Both Tables 3 and 4 proceed in a similar manner. Model 1 considers the association between maternal incarceration and children's behavioral problems, adjusting only for whether both parents were missing at the follow-up interviews and which caregiver reported on the children's behavioral problems.[16] In subsequent models, we also adjust for a broad range of maternal (Model 2) and paternal characteristics (Model 3). We then adjust for maternal behaviors (such as drug abuse), as well as children's birth weight and temperament (Model 4) and, finally, adjust for parallel paternal behaviors to Model 4 (Model 5).

In the third analytic stage, we implement propensity score models (Table 5). Covariate adjustment, used in the analyses presented in Tables 3 and 4, diminishes concerns about pre-existing differences between children with and without recently incarcerated mothers. Propensity

[14] We also considered the possibility that maternal incarceration could affect the risk of having exceptionally high behavioral problems. To consider this possibility, we created a dummy variable indicating high behavioral problems (1 = 1.5 standard deviations greater than the mean, 0 = not 1.5 standard deviations greater than the mean). Results provided no consistent evidence that effects of maternal incarceration increase the risk of high behavioral problems.

[15] Since some analyses using these data find that the effects of paternal incarceration differ by child sex, with boys responding with elevated levels of externalizing and physically aggressive behaviors (Geller et al. 2012; Wildeman 2010), we tested whether there were significant differences in the effects of maternal incarceration by child sex in all models by including an interaction term. For none of the 21 outcomes did boys and girls respond significantly differently to maternal incarceration, although the interaction coefficient was more often in the direction of worse effects on boys than on girls. Thus, our null results do not appear to hide negative effects on boys or girls.

[16] We also adjust for which caregiver reports on the child's behavioral problems in the models considering teacher-reported behavioral problems in the interest in producing parallel results for the two sets of analyses. Robustness checks in which we did not make this adjustment produced substantively similar results, suggesting that our decision to choose to present results from parallel model did not lead to presenting results that are misleading in any way.

score matching is another way to diminish concerns about pre-existing differences between groups and is especially useful when differences in observed characteristics are acute (Morgan and Harding 2006; Rosenbaum and Rubin 1983). Propensity score matching makes the treatment (children with recently incarcerated mothers) and control (children without recently incarcerated mothers) groups as similar as possible, which is beneficial given the stark differences between these groups (see Table 2). It is also useful given the relatively small number of children who had mothers incarcerated during this period (n = 291 for those with caregiver-reported measures, n = 178 for those with teacher-reported measures). We generate a propensity score for each observation that estimates the probability of maternal incarceration.[17] We then match observations on the basis of these scores. We use kernel matching, which compares each treated observation with all control observations but weights the control observations according to their distance from treatment cases, and rely on an Epanechnikov kernel and a bandwidth of .006, although results were robust to using other kernel types, bandwidths, and model specifications.[18]

Finally, in the fourth analytic stage (Table 6), we estimate caregiver- and teacher-reported behavioral problems by considering the combination of maternal and paternal incarceration. In these analyses, our explanatory variables are a series of mutually exclusive dummy variables indicating parental incarceration between the one- and nine-year interviews: both mother and father incarcerated, only father incarcerated, only mother incarcerated, and neither parent incarcerated (reference category). Controls in this stage correspond to Model 5 in Tables 3 and 4.

[17] For these analyses, we match on all covariates included in the basic OLS regression model. More complex specifications in which we included potentially important two-way interactions (Morgan and Winship 2007:113) did not dramatically enhance model fit and altered point estimates negligibly, so we present results from the simpler model. Covariate balance could not be achieved once potentially important three-way interactions were introduced.
[18] In supplemental analyses, we used (1) nearest neighbor matching, which compares each treatment observation to a control observation with the closest propensity score, and (2) radius matching, which compares treatment and control observations within a radius, using a caliper of .001. Results are robust to these alternate specifications.

RESULTS

Descriptive Statistics

We first present descriptive statistics of children's behavioral problems, separately for children who did and did not experience maternal incarceration (Table 1). As noted above, all measures of behavioral problems are standardized (mean = 0, standard deviation = 1) and higher values indicate more problems. Children with recently incarcerated mothers had more behavioral problems for 5 of the 11 caregiver-reported outcomes and 9 of the 10 teacher-reported outcomes. For example, children with incarcerated mothers had aggressive behaviors that were about one-sixth of a standard deviation higher than their counterparts without incarcerated mothers (0.153 compared to -0.015, $p < .01$). Children with incarcerated mothers also had more attention problems (0.155 compared to -.015, $p < .01$), social problems (0.934 compared to -0.018, $p < .01$), externalizing problems (0.143 compared to -0.014, $p < .01$), and total problems (0.124 compared to -0.012, $p < .05$). With respect to teacher-reported outcomes, children of incarcerated mothers were significantly disadvantaged across all outcomes except for internalizing problems. The differences in teacher-reported behavioral problems between children with and without incarcerated mothers are relatively large, translating into between one-fifth (e.g., oppositional problems) and one-third (e.g., self-control problems) of a standard deviation difference.

[Insert Table 1 about here.]

Of course, the differences in behavioral problems between children with and without incarcerated mothers may stem from characteristics associated with both maternal incarceration and behavioral problems. Indeed, there are dramatic differences in demographic characteristics, socioeconomic characteristics, and behaviors across these two groups, with incarcerated mothers being more disadvantaged than their counterparts (Table 2). Importantly, these characteristics

were measured prior to incarceration and, thus, do not result from incarceration. For example, 43% of mothers incarcerated between the one- and nine-year interviews did not graduate from high school, compared to 29% of other mothers ($p < .05$). Recently incarcerated mothers were less likely to be married to the child's father (15% compared to 30%, $p < .001$), and had lower income-to-poverty ratios ($p < .001$) and more material hardship ($p < .001$).

Differences in maternal behaviors are also striking. For example, 30% of incarcerated mothers but only 11% of non-incarcerated mothers reported using drugs or drinking alcohol while pregnant with the focal child. Incarcerated mothers were also more likely to have a substance abuse problem ($p < .05$), report depression ($p < .05$), or experience previous incarceration ($p < .05$). In addition, fathers who share children with incarcerated mothers, compared to other fathers, are disadvantaged in a variety of ways. They have significantly less education ($p < .05$), and they are more likely to have a substance use problem ($p < .001$) or to have engaged in domestic violence ($p < .001$), for example. Though incarceration prior to the one-year interview is common among all fathers, it is more common among fathers who share children with incarcerated mothers than among other fathers (50% compared to 31%, $p < .001$).

[Insert Table 2 about here.]

Estimating Effects on Caregiver-Reported Behavioral Problems

Given the sharp differences between mothers incarcerated between the one- and nine-year interviews and mothers not incarcerated during this time period, it is especially important to consider characteristics that may render the association between maternal incarceration and children's behavioral problems spurious. Thus, in Table 3, we present a series of regression models that gradually adjust for a host of individual-level characteristics of mothers, fathers, and

children. Model 1, in which we adjust only for whether both parents were missing at each of the surveys and which caregiver reported the children's behavioral problems, shows results similar to the descriptive statistics presented in Table 1. For 2 of the 11 outcomes (social problems and externalizing problems), children of incarcerated mothers have more behavioral problems than their counterparts. But when we adjust for demographic characteristics in Model 2, the association between maternal incarceration and both of these two outcomes becomes small and statistically insignificant. The coefficient for social problems, for example, diminishes by 70% from Models 1 to 2 (.053, n.s.). This pattern is similar with respect to externalizing problems, where the coefficient actually flips from .097 in Model 1 to -.034 in Model 2. Although each of the maternal characteristics considered partially explains these reductions, more than half of the decline can be explained by including mother's income-to-poverty ratio and material hardship. Thus, although the mother's family of origin, relationship status, educational attainment, and race/ethnicity explain some of the association, economic factors play an exceptionally vital role.

Findings in Model 2 suggest that the relationship between maternal incarceration and caregiver-reported behavioral problems can be entirely explained by maternal characteristics. As we progressively adjust for paternal characteristics (Model 3), maternal behaviors (Model 4), and paternal behaviors (Model 5), the maternal incarceration coefficients continue to decrease, with many becoming negative. In fact, in Models 4 and 5, all but one of the maternal incarceration coefficients are negative, suggesting that the insignificance of the effects is not driven by small sample size. More interestingly, in the final model, maternal incarceration is associated with significantly *fewer* rule-breaking behaviors (-.133; $p < .05$), suggesting that, with respect to caregiver-reported problems, the limited evidence of the unique effects of maternal incarceration points in the direction of decreasing rather than increasing children's behavioral problems.

[Insert Table 3 about here.]

Estimating Effects on Teacher-Reported Behavioral Problems

We consider the association between maternal incarceration and teacher-reported behavioral problems in Table 4, and these models progress in the same manner as those presented in Table 3. Similar to the descriptives in Table 1, the unadjusted association shows that maternal incarceration is associated with all but two teacher-reported outcomes (cognitive problems and internalizing behaviors). After adjusting for maternal demographic characteristics in Model 2, all maternal incarceration coefficients are reduced in size, ranging from a 37% decrease (self-control) to a 93% decrease (internalizing problems). Additionally, with the exception of self-control, all maternal incarceration coefficients fall to statistical insignificance, suggesting that these traits account for the association between maternal incarceration and teacher-reported child behavioral problems. Interestingly, although economic conditions explain a large share of these decreases, as they did when estimating caregiver-reported outcomes, parental relationship status and quality are the most powerful factors explaining the fall to statistical insignificance.

In the remainder of Table 4, the association between maternal incarceration and teacher-reported self-control remains significant when we include paternal characteristics (Model 3), maternal behaviors (Model 4), and paternal behaviors (Model 5). Taken together with Table 3, our results suggest the relationship between maternal incarceration and children's behavioral problems is null for 19 of 21 outcomes, negative for 1 outcome (self-control) and positive for 1 outcome (rule-breaking), suggesting that the average effects of maternal incarceration are null.

[Insert Table 4 about here.]

Propensity Score Models

We further consider the relationship between maternal incarceration and children's behavioral problems with propensity score models (Table 5). These results show that, with one exception, maternal incarceration is not associated with caregiver- and teacher-reported behavioral problems. In fact, coefficients presented in this table are small and, for all caregiver-reported outcomes, negative. Maternal incarceration is associated with 1 of the 21 (4.8%) behavioral problems we consider at the .05 level—as in the OLS models, it is associated with a significant decline in rule-breaking behaviors—almost exactly what we would expect due to chance (5.0%). Consistent with Tables 3 and 4, the propensity score models suggest the association between maternal incarceration and children's behavioral problems is null. Also consistent with Tables 3 and 4, this null relationship is not driven by sample size (with the possible exception of teacher-reported self-control), as would be the case if we had substantial but statistically insignificant coefficients. Instead, the null relationship is driven by small and often negative coefficients.

[Insert Table 5 about here.]

Considering Effects of Maternal and Paternal Incarceration Simultaneously

Finally, in Table 6 we consider the combination of maternal and paternal incarceration. We turn first to caregiver-reported behavioral problems. Maternal incarceration, whether only the mother experiences incarceration or both the mother and the father experience it, is not associated with any of the 11 caregiver-reported behavioral problems. But children experiencing paternal incarceration have more behavioral problems than those experiencing no parental incarceration. The effects of paternal incarceration persist for all but one outcome (somatic complaints).

[Insert Table 6 about here.]

We turn next to teacher-reported behavioral problems. Children who experienced only maternal incarceration (compared to their counterparts who experienced neither maternal nor paternal incarceration) are only disadvantaged in their self-control problems ($p < .05$). Additionally, as expected, paternal incarceration is associated with some teacher-reported behavioral problems. Children who experienced paternal incarceration, compared to those who experienced no parental incarceration, have more oppositional problems (0.140, $p < .01$), hyperactivity (0.123, $p < .05$), ADHD (0.105, $p < .05$), social problems (0.167, $p < .01$), assertion problems (0.112, $p < .05$), self-control problems (0.128, $p < .05$), and externalizing problems (0.155, $p < .01$). Furthermore, having both parents incarcerated also shapes children's teacher-reported behavioral problems, as children with both parents incarcerated have significantly more attention problems (0.180, $p < .05$), are more hyperactive (0.277, $p < .05$), exhibit more ADHD behaviors (0.262, $p < .05$), and have more externalizing behaviors (0.212, $p < .05$). These substantial and significant effects suggest there is far stronger evidence that having both parents incarcerated increases behavioral problems than there is that maternal incarceration has any independent effect on behavioral problems. Indeed, as with the previous analyses, there is only limited evidence of an independent effect of maternal incarceration, even though some of the maternal incarceration coefficients are large enough as to merit further investigating despite their statistical insignificance. This is especially the case for assertion (.208) and externalizing (.175) problems, both of which showed larger (albeit insignificant) effects than paternal incarceration.

DISCUSSION

Dramatic, highly concentrated increases in the American imprisonment rate have led to great interest in the consequences of parental incarceration for children. To date, the majority of

research on parental incarceration considers the effects of paternal incarceration on children's outcomes, finding significant and negative effects in childhood (e.g., Geller et al. 2012; Wakefield and Wildeman 2011; Wildeman 2010), adolescence (e.g., Foster and Hagan 2007; Roettger and Swisher 2011), and adulthood (e.g., Murray and Farrington 2005, 2008). Less research considers the effects of maternal incarceration on children, and very little examines the *average* effects of maternal incarceration on children, focusing instead on the moderators of these effects (e.g., Poehlmann 2005; but see Cho 2009a, 2009b; Hagan and Foster 2012).

In this article, we extend research on the consequences of mass imprisonment for children by providing a strong and broad test of the consequences of maternal incarceration for children's behavioral problems. To do so, we use data from the Fragile Families and Child Wellbeing Study and a series of OLS and propensity score models to consider effects on 21 caregiver- and teacher-reported child behavioral problems. These data are uniquely suited to this task because of the large number of mothers and fathers who experience incarceration, the vast array of available confounding variables, and the measurement of both caregiver- and teacher-reported behavioral problems. This final point is vital because it diminishes concerns about common reporter bias and shows that our findings are robust to when caregivers and teachers are present.

Results provide support for a number of conclusions. First, and most importantly, the average effects of maternal incarceration on children's behavioral problems are more often null than positive or negative. This suggests that despite reasons to expect maternal incarceration to have positive (e.g., Siegel 2011:76-93) or negative (e.g., Kruttschnitt 2010) effects, the most rigorous analyses to date suggest that the effects are instead null, which is also consistent with broader arguments about selection made by criminologists (e.g., Giordano 2010:147-150; Sampson 2011). In the OLS regression models estimating caregiver-reported behavioral

problems (Table 3), after adjusting for the full range of covariates, maternal incarceration was associated with a statistically significant difference in only 1 of the 11 outcomes. The story was similar for the OLS regression models estimating teacher-reported behavioral problems (Table 4). In the propensity score models (Table 5), we found only that maternal incarceration was associated with significantly *fewer* rule-breaking behaviors. Nonetheless, we are cautious in our interpretation of this protective effect given that we would expect to see one significant effect of the 21 outcomes we tested, by chance, at the .05 level. Thus, results generally suggest maternal incarceration has, on average, no independent effect on children's behavioral problems.

A second important conclusion, gleaned from our analysis of the joint effects of paternal and maternal incarceration (Table 6), is that although maternal incarceration is only rarely (for 1 of 21 the outcomes) independently associated with significant differences in children's behavioral problems, paternal incarceration is associated with substantially and statistically significant more behavioral problems. The second part of this finding is broadly consistent with prior research on the consequences of paternal incarceration for young children using the FFCW and other data (e.g., Geller et al. 2012; Wakefield and Wildeman 2011; Wildeman 2010). For 17 of the 21 outcomes, paternal incarceration (compared to no parental incarceration) was associated with significantly greater behavioral problems, suggesting the null effects of maternal incarceration are not artifacts of our analytic strategy. There were some signs, however, that experiencing both maternal and paternal incarceration over this eight-year period is linked with significantly more teacher-reported behavioral problems. Thus, we can only confidently state that maternal incarceration is detrimental to children's behavior when the father had also been incarcerated at some point in the last eight years, an important caveat in this literature.

Although these findings are provocative, our study nonetheless has three limitations. First, as we lack an exogenous shock in maternal incarceration, it remains unclear whether we have identified a true null effect. As such, future research should consider exogenous shocks in maternal incarceration. Second, nonrandom attrition may also provide an obstacle. However, because any nonrandom attrition is likely based on unobserved traits, as opposed to observed traits, the magnitude of this problem is unknown. This issue is especially complex given the effects of maternal imprisonment on foster care placement (Swann and Sylvester 2006), which may be linked to attrition and children's behavioral problems (Berger et al. 2009; Doyle 2007, 2008). Future research could address this concern with administrative data, as some of the most rigorous previous research in this area has previously done (Cho 2009a, 2009b).

Finally, findings from our robustness checks suggest that we would have reached substantively different conclusions if we considered only the results from one of those checks. For example, if we limited our analysis of caregiver-reported behavioral problems to the smaller sample that included teacher-reported outcomes, we would have found maternal incarceration is associated with significant *decreases* in four behavioral problems. If we used the more conservative measure of maternal incarceration, we would have found maternal incarceration is associated with significant *increases* in four behavioral problems. Thus, had we relied solely on one of these checks, we would have reached the conclusion that maternal incarceration increases some behavioral problems or that maternal incarceration decreases some behavioral problems. Although the sensitivity of our analyses to model specification, coding decisions, and sample choice would be a serious concern if we had strongly motivated positive or negative effects (or found them across all specifications shown here), this is a relatively small concern for two reasons. First, in each case, we would have found significant effects for only 4 of 21 outcomes,

suggesting the primary story would still be that maternal incarceration has null effects. Second, that the relationship between maternal incarceration and children's behavioral problems so easily changes directions and levels of statistical significance further drives home our primary message: There are no consistent effects of maternal incarceration on children's behavioral problems.

Limitations aside, these conclusions have important implications for the consequences of mass imprisonment for family life and the factors that shape social inequalities in child wellbeing more broadly. Most importantly, since they show that maternal incarceration has no discernible consequences for children's behavioral problems, our results suggest that the effects of mass imprisonment on family life may not be exclusively negative, a point often missed in previous research on this topic (but see Cho 2009a, 2009b). Indeed, they suggest that the consequences of mass imprisonment for family life likely include some combination of positive, negative, and null effects, all of which need to be actively interrogated in future research. This stands in stark contradistinction to some previous research finding massive effects of maternal incarceration on children and implies that, after appropriately adjusting for selection into incarceration, there is no direct effect of maternal incarceration on children's behavior. In light of these findings, we suggest the implementation of broader public policies that focus not solely on the effects of maternal incarceration on children, but also on interventions that occur prior to incarceration because such programs might most enhance child wellbeing and diminish social inequalities in such. Merely reducing rates of maternal imprisonment, on the other hand, is unlikely to do so.

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Table 1. Descriptive Statistics of Children's Problem Behaviors (Standardized)

	Maternal incarceration		No maternal incarceration		
	Mean	S.D.	Mean	S.D.	
Caregiver-reported behavioral problems (291, 3,039)[a]					
Aggressive	0.153	(1.023)	-0.015	(0.996)	**
Withdrawn/depressed	0.080	(1.000)	-0.008	(0.999)	
Anxious/depressed	0.041	(0.965)	-0.004	(1.003)	
Attention problems	0.155	(1.021)	-0.015	(0.997)	**
Social problems	0.193	(1.049)	-0.018	(0.993)	*
Rule-breaking behavior	0.099	(0.889)	-0.009	(1.009)	
Somatic complaints	0.076	(1.031)	-0.007	(0.997)	
Thought problems	0.104	(0.993)	-0.010	(1.000)	
Internalizing problems	0.076	(0.986)	-0.007	(1.001)	
Externalizing problems	0.143	(0.981)	-0.014	(1.006)	**
Total problems	0.124	(0.965)	-0.012	(1.002)	*
Teacher-reported behavioral problems (178, 1,995)[b]					
Oppositional problems	0.194	(1.044)	-0.017	(0.994)	*
Cognitive problems/inattention	0.182	(0.969)	-0.016	(1.001)	**
Hyperactivity	0.205	(1.045)	-0.018	(0.994)	*
ADHD	0.221	(1.022)	-0.020	(0.995)	**
Cooperation problems	0.270	(0.956)	-0.024	(1.000)	***
Social problems	0.228	(0.878)	-0.020	(1.007)	***
Assertion problems	0.268	(0.902)	-0.024	(1.004)	***
Self-control problems	0.337	(0.922)	-0.030	(1.001)	***
Internalizing problems	0.110	(0.851)	-0.009	(1.011)	
Externalizing problems	0.252	(0.980)	-0.022	(0.998)	***

Note: Asterisks indicate significance levels based on two-sided t-tests comparing children who experienced maternal incarceration and children who did not experience maternal incarceration. * $p < .05$, ** $p < .01$, *** $p < .001$.

[a] Among children with valid caregiver-reported behavior problems, 291 experienced maternal incarceration between the one- and nine-year surveys and 3,039 did not experience maternal incarceration between the one- and nine-year surveys.

[b] Among children with valid teacher-reported behavior problems, 178 experienced maternal incarceration between the one- and nine-year surveys and 1,995 did not experience maternal incarceration between the one- and nine-year surveys.

Table 2. Descriptive Statistics of Additional Variables Used in Analyses

	Full sample		Maternal incarceration		No maternal incarceration		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Mother incarceration	0.087		1.000		0.000		***
Parental incarceration							
Both parents incarcerated	0.046		0.529		0.000		***
Only father incarcerated	0.308		0.000		0.336		
Only mother incarcerated	0.041		0.471		0.000		
Neither parent incarcerated	0.605		0.000		0.664		
Both parents missing at one-year interview	0.045		0.017		0.048		**
Both parents missing at three-year interview	0.050		0.017		0.053		**
Both parents missing at five-year interview	0.045		0.038		0.046		
Both parents missing at nine-year interview	0.013		0.024		0.011		*
Caregiver reporting							***
Mother	0.924		0.701		0.945		
Father	0.039		0.168		0.027		
Other	0.037		0.131		0.028		
Mother race							*
Non-Hispanic Black	0.501		0.557		0.496		
Non-Hispanic White	0.208		0.209		0.208		
Hispanic	0.256		0.209		0.261		
Non-Hispanic other race	0.035		0.031		0.035		
Mother immigrant	0.137		0.038		0.146		***
Mother age	25.035	(5.977)	24.416	5.796	25.094	(5.991)	
Mother education							***
Less than high school	0.303		0.429		0.291		
High school diploma or GED	0.287		0.326		0.283		
Post-secondary education	0.411		0.244		0.426		
Mother lived with both biological parents at age 15	0.413		0.304		0.423		***
Mother income-to-poverty ratio	1.795	(2.207)	1.152	(1.288)	1.856	(2.260)	***
Mother hardship	1.166	(1.612)	1.852	(2.056)	1.099	(1.547)	***
Mother living with child's grandparent	0.192		0.193		0.191		
Mother relationship status with child's father							***
Married	0.283		0.148		0.297		
Cohabiting	0.281		0.286		0.280		
Nonresidential romantic relationship	0.113		0.100		0.114		
No relationship	0.380		0.502		0.368		
Mother repartnered	0.049		0.072		0.046		
Mother relationship quality	2.741	(1.407)	3.184	(1.462)	2.698	(1.401)	***
Mother number of children in household	2.309	(1.334)	2.568	(1.425)	2.284	(1.302)	*
Mother parenting stress	2.173	(0.673)	2.295	(0.705)	2.162	(0.665)	*
Child male	0.525		0.540		0.524		
Father race							
Non-Hispanic Black	0.521		0.584		0.515		
Non-Hispanic White	0.181		0.158		0.183		
Hispanic	0.256		0.216		0.260		
Non-Hispanic other race	0.041		0.041		0.042		
Father immigrant	0.155		0.076		0.162		***

Father age	27.523	(7.196)	27.469	(7.651)	27.528	(7.151)	
Father education							*
Less than high school	0.351		0.395		0.347		
High school diploma or GED	0.333		0.368		0.330		
Post-secondary education	0.315		0.237		0.322		
Mother smoked during pregnancy	0.193		0.450		0.168		***
Mother used drugs or drank alcohol during pregnancy	0.128		0.302		0.111		***
Mother substance abuse problem	0.014		0.041		0.011		*
Mother self-control	3.472	0.485	3.275	(0.552)	3.491	(0.473)	***
Mother depressed	0.156		0.209		0.151		*
Mother prior incarceration	0.007		0.027		0.004		*
Child born low birth weight	0.092		0.131		0.088		*
Child temperament	0.568	(0.128)	0.553	(0.136)	0.569	(0.127)	
Father self-control	3.199	(0.811)	2.833	(0.880)	3.230	(0.792)	***
Father substance abuse problem	0.184		0.320		0.171		***
Father engaged in domestic violence	0.079		0.221		0.065		***
Father employed	0.635		0.577		0.640		
Father prior incarceration	0.325		0.498		0.308		***
N	3,330		291		3,039		

Note: Asterisks indicate significance levels based on two-sided chi-square tests or t-tests comparing children who experienced maternal incarceration and children who did not experience maternal incarceration. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3. OLS Regression Models Estimating Children's Caregiver-Reported Behavioral Problems as a Function of Maternal Incarceration

	Model 1		Model 2	Model 3	Model 4	Model 5	
Aggressive	0.108		-0.013	-0.014	-0.068	-0.089	
	(0.063)		(0.063)	(0.063)	(0.064)	(0.064)	
Withdrawn/depressed	0.083		-0.017	0.000	-0.044	-0.039	
	(0.064)		(0.064)	(0.064)	(0.064)	(0.065)	
Anxious/depressed	0.029		-0.019	-0.017	-0.038	-0.044	
	(0.064)		(0.064)	(0.064)	(0.065)	(0.065)	
Attention problems	0.095		-0.009	-0.009	-0.044	-0.061	
	(0.064)		(0.063)	(0.063)	(0.064)	(0.064)	
Social problems	0.178	**	0.053	0.055	0.002	-0.006	
	(0.064)		(0.064)	(0.064)	(0.064)	(0.064)	
Rule-breaking behavior	0.056		-0.069	-0.070	-0.118	-0.133	*
	(0.064)		(0.063)	(0.063)	(0.064)	(0.064)	
Somatic complaints	0.097		0.023	0.021	0.004	0.004	
	(0.064)		(0.064)	(0.064)	(0.065)	(0.066)	
Thought problems	0.054		-0.035	-0.035	-0.071	-0.080	
	(0.064)		(0.064)	(0.064)	(0.065)	(0.065)	
Internalizing problems	0.079		0.000	0.000	-0.031	-0.032	
	(0.064)		(0.064)	(0.064)	(0.065)	(0.065)	
Externalizing problems	0.097	*	-0.034	-0.034	-0.090	-0.011	
	(0.064)		(0.063)	(0.063)	(0.064)	(0.064)	
Total problems	0.098		-0.020	-0.020	-0.069	-0.082	
	(0.064)		(0.064)	(0.064)	(0.064)	(0.065)	
N	3,330		3,330	3,330	3,330	3,330	

Note: Each row comprises a separate regression model. Model 1 and all subsequent models include maternal incarceration, as well as dummy variables indicating both parents were missing at each survey wave and dummy variables indicating who reported on the child's behavioral problems. Model 2 includes the following variables: mother race, mother immigrant status, mother age, mother education, mother lived with both biological parents at age 15, mother income-to-poverty ratio, mother material hardship, child's grandparent in mother's household, mother relationship status with child's father, mother relationship quality, mother repartnered, number of children in mother's household, mother parenting stress, and child gender. Model 3 extends Model 2 to include the following: father race, father immigrant status, father age, and father education. Model 4 extends Model 3 to include the following: mother smoked while pregnant, mother used drugs or drank alcohol while pregnant, mother substance abuse problem, mother self-control, mother depressed, mother incarcerated between the baseline and one-year interview, child born low birth weight, and child temperament. Model 5 extends Model 4 to include father self-control, father substance abuse problem, father engaged in domestic violence, father employed, and father incarcerated prior to the one-year survey (including before baseline). Standard errors in parentheses. * $p < .05$, ** $p < .01$.

Table 4. OLS Regression Models Estimating Children's Teacher-Reported Behavioral Problems as a Function of Maternal Incarceration

	Model 1		Model 2		Model 3		Model 4		Model 5	
Oppositional problems	0.189	*	0.089		0.092		0.070		0.053	
	(0.081)		(0.079)		(0.079)		(0.080)		(0.081)	
Cognitive problems/inattention	0.155		0.023		0.030		0.017		0.029	
	(0.081)		(0.079)		(0.079)		(0.080)		(0.081)	
Hyperactivity	0.181	*	0.096		0.099		0.081		0.058	
	(0.081)		(0.079)		(0.079)		(0.080)		(0.081)	
ADHD	0.182	*	0.075		0.081		0.063		0.045	
	(0.081)		(0.078)		(0.078)		(0.079)		(0.080)	
Cooperation problems	0.239	**	0.121		0.129		0.105		0.082	
	(0.081)		(0.078)		(0.077)		(0.078)		(0.079)	
Social problems	0.220	**	0.104		0.108		0.098		0.078	
	(0.081)		(0.079)		(0.079)		(0.080)		(0.081)	
Assertion problems	0.261	**	0.137		0.142		0.112		0.106	
	(0.081)		(0.079)		(0.079)		(0.080)		(0.081)	
Self-control problems	0.330	***	0.207	**	0.213	**	0.189	*	0.166	*
	(0.081)		(0.078)		(0.077)		(0.078)		(0.079)	
Internalizing problems	0.096		0.007		0.008		0.070		-0.003	
	(0.082)		(0.082)		(0.082)		(0.083)		(0.084)	
Externalizing problems	0.252	**	0.149		0.155	*	0.139		0.119	
	(0.081)		(0.078)		(0.078)		(0.079)		(0.080)	
N	2,173		2,173		2,173		2,173		2,173	

Note: Each row comprises a separate regression model. Model 1 and all subsequent models include maternal incarceration, as well as dummy variables indicating both parents were missing at each survey wave and dummy variables indicating who reported on the child's behavioral problems. Model 2 includes the following variables: mother race, mother immigrant status, mother age, mother education, mother lived with both biological parents at age 15, mother income-to-poverty ratio, mother material hardship, child's grandparent in mother's household, mother relationship status with child's father, mother relationship quality, mother repartnered, number of children in mother's household, mother parenting stress, and child gender. Model 3 extends Model 2 to include the following: father race, father immigrant status, father age, and father education. Model 4 extends Model 3 to include the following: mother smoked while pregnant, mother used drugs or drank alcohol while pregnant, mother substance abuse problem, mother self-control, mother depressed, mother incarcerated between the baseline and one-year interview, child born low birth weight, and child temperament. Model 5 extends Model 4 to include father self-control, father substance abuse problem, father engaged in domestic violence, father employed, and father incarcerated prior to the one-year survey (including before baseline). Standard errors in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5. Propensity Score Matching Models Estimating the Consequences of Maternal Incarceration for Children's Caregiver- and Teacher-Reported Behavioral Problems

	Coefficient	Standard error	T-statistic	
Mother-reported behavioral problems (291, 3,039)[a]				
Aggressive	-0.057	(0.071)	-0.80	
Withdrawn/depressed	0.010	(0.070)	0.14	
Anxious/depressed	0.008	(0.069)	0.11	
Attention problems	-0.065	(0.071)	-0.93	
Social problems	0.048	(0.073)	0.66	
Rule-breaking behavior	-0.136	(0.065)	-2.08	*
Somatic complaints	0.046	(0.072)	0.64	
Thought problems	-0.054	(0.070)	-0.78	
Internalizing problems	0.025	(0.070)	0.36	
Externalizing problems	-0.088	(0.069)	-1.27	
Total problems	-0.041	(0.069)	-0.60	
Teacher-reported behavioral problems (178, 1,995)[b]				
Oppositional problems	0.088	(0.094)	0.93	
Cognitive problems/inattention	0.035	(0.090)	0.38	
Hyperactivity	0.056	(0.094)	0.60	
ADHD	0.052	(0.093)	0.56	
Cooperation problems	0.096	(0.089)	1.08	
Social problems	0.072	(0.085)	0.85	
Assertion problems	0.107	(0.086)	1.24	
Self-control problems	0.165	(0.087)	1.90	
Internalizing problems	-0.034	(0.083)	-0.42	
Externalizing problems	0.132	(0.091)	1.48	

Note: Propensity score models use kernel matching.

[a] Among children with valid caregiver-reported behavior problems, 291 experienced the treatment (maternal incarceration between the one- and nine-year surveys) and 3,039 did not experience the treatment.

[b] Among children with valid teacher-reported behavior problems, 178 experienced the treatment (maternal incarceration between the one- and nine-year surveys) and 1,995 did not experience the treatment.

Table 6. OLS Regression Models Estimating Children's Caregiver- and Teacher-Reported Behavioral Problems as a Function of Maternal and Paternal Incarceration

	Parental incarceration[a]					
	Both		Only father		Only mother	
Caregiver-reported behavioral problems (N = 3,330)						
Aggressive	0.017		0.197	***	-0.010	
	(0.087)		(0.043)		(0.090)	
Withdrawn/depressed	-0.007		0.151	**	0.077	
	(0.089)		(0.044)		(0.044)	
Anxious/depressed	0.051		0.124	**	-0.026	
	(0.088)		(0.044)		(0.093)	
Attention problems	0.014		0.233	***	0.089	
	(0.087)		(0.043)		(0.090)	
Social problems	0.077		0.165	***	0.066	
	(0.088)		(0.044)		(0.091)	
Rule-breaking behavior	-0.028		0.191	***	-0.059	
	(0.087)		(0.043)		(0.091)	
Somatic complaints	0.059		0.075		0.017	
	(0.089)		(0.044)		(0.093)	
Thought problems	0.027		0.203	***	0.027	
	(0.089)		(0.044)		(0.092)	
Internalizing problems	0.046		0.136	**	0.016	
	(0.088)		(0.044)		(0.092)	
Externalizing problems	0.003		0.208	***	-0.028	
	(0.087)		(0.043)		(0.090)	
Total problems	0.025		0.193	***	-0.009	
	(0.088)		(0.044)		(0.091)	
Teacher-reported behavioral problems (N = 2,173)						
Oppositional problems	0.161		0.140	**	0.065	
	(0.108)		(0.053)		(0.114)	
Cognitive problems/inattention	0.180	*	0.029		-0.124	
	(0.108)		(0.053)		(0.115)	
Hyperactivity	0.277	*	0.123	*	-0.077	
	(0.108)		(0.053)		(0.114)	
ADHD	0.262	*	0.105	*	-0.111	
	(0.106)		(0.052)		(0.113)	
Cooperation problems	0.138		0.056		0.071	
	(0.105)		(0.052)		(0.112)	
Social problems	0.166		0.167	**	0.143	
	(0.108)		(0.053)		(0.115)	
Assertion problems	0.116		0.112	*	0.208	
	(0.108)		(0.053)		(0.114)	
Self-control problems	0.187		0.128	*	0.270	*
	(0.106)		(0.052)		(0.112)	
Internalizing problems	0.046		0.105		0.044	
	(0.112)		(0.055)		(0.119)	
Externalizing problems	0.212	*	0.165	**	0.175	
	(0.106)		(0.052)		(0.113)	

Note: Each row comprises a separate regression model. Models include all controls from Model 5 of Tables 3 and 4. Standard errors in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$.

[a] Parental incarceration is measured as a series of mutually exclusive dummy variables: both parents incarcerated between the one- and nine-year surveys, only father incarcerated between the one- and nine-year surveys, only mother incarcerated between the one- and nine-year surveys, and neither parent incarcerated between the one- and nine-year surveys (reference category).