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

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Abstract 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 9-year-old children. The results suggest three primary conclusions. First, children of incarcerated mothers are a disadvantaged group that exhibit high levels of caregiver- and teacher-reported behavioral problems. Second, after we adjust for selection, the effects of maternal incarceration on children's behavioral problems are consistently null (for 19 of 21 outcomes) and rarely positive (1 of 21) or negative (1 of 21), suggesting that the poor outcomes of these children are driven by disadvantages preceding maternal incarceration rather than incarceration. These effects, however, vary across race/ethnicity, with maternal incarceration diminishing caregiver-reported behavioral problems among non-Hispanic whites. Finally, in models considering both maternal and paternal incarceration, paternal incarceration is associated with more behavioral problems, which is consistent with previous research and suggests that the null effects of maternal incarceration are not artifacts of our sample or analytic decisions.

Keywords Maternal incarceration · Prison boom · Child well-being · Collateral consequences of mass incarceration · Child behavioral problems

Introduction and Background

As a result of dramatic increases in imprisonment, scholars have become interested in the consequences of paternal incarceration for child well-being, finding that paternal incarceration has a range of detrimental effects on children (e.g., Geller et al. 2012; Hagan and Dinovitzer 1999; Wakefield and Wildeman 2011; Wildeman 2010),

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adolescents (e.g., Foster and Hagan 2007; Roettger and Swisher 2011), and adults (e.g., Murray and Farrington 2005, 2008). The emphasis on the effects of paternal incarceration on children is warranted because the cumulative risk of paternal imprisonment is greater than the risk of maternal imprisonment (Wildeman 2009). At the same time, however, *relative* increases in imprisonment have been greater for women than men since the 1980s (e.g., Blumstein and Beck 1999; Kruttschnitt 2010), leading to massive growth in the risk of maternal imprisonment—especially for non-Hispanic black children (Wildeman 2009)—and launching a vibrant interdisciplinary, multimethod research literature on the relationship between maternal incarceration and child well-being (for two reviews, see Arditti 2012a, b).

To date, the primary emphasis of this research has been to provide a descriptive portrait of currently or formerly incarcerated mothers and their children (e.g., Arditti 2012a; Enos 2001; Siegel 2011) or to show how various background factors—especially whether mothers were living with children immediately prior to incarceration—moderate the association between maternal incarceration and child well-being (e.g., Hanlon et al. 2005a, b; Poehlmann 2005; Turanovic et al. 2012). Some research has also considered the effects of maternal incarceration on children, often using large, nationally representative data sets, carefully designed experiments, or thoughtfully matched children (e.g., Arditti 2012a; Cho 2009a, b; Dallaire et al. 2010; Hagan and Foster 2012; Huebner and Gustafson 2007) to overcome the substantial obstacles to causal inference (e.g., Giordano 2010; Johnson and Easterling 2012; Johnston 2006; Kruttschnitt 2010; Mumola 2000; Sampson 2011; Siegel 2011; Wildeman et al. 2013).

Unfortunately, despite this impressive quantitative and qualitative research base, it remains unclear whether maternal incarceration has positive, negative, or null effects on children. Indeed, some qualitative research demonstrates that maternal incarceration is a distinct stressor that harms children (e.g., Arditti 2012b). However, other qualitative research shows that for some children, especially those of addicted mothers who place their children in harmful situations, maternal incarceration may lead to improved outcomes (e.g., Siegel 2011:76–93; Turanovic et al. 2012). Additional research has suggested no direct effect of maternal incarceration on children (e.g., Giordano 2010:147–150; Johnston 2006).[1] In a similar vein, the results from quantitative studies on children's educational outcomes sharply diverge. Experimental research has shown that maternal incarceration diminishes teacher expectations for children (Dallaire et al. 2010), studies using nationally representative data have linked maternal incarceration with worse adolescent grades (Hagan and Foster 2012), and studies using administrative data have suggested that maternal incarceration has no effect on children's test scores and decreases their risk of retention (Cho 2009a, b). Thus, how maternal incarceration affects children is unclear, and the effects of maternal imprisonment on children's behaviors, moreover, are even less understood.

In this article, we extend this literature by using 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 9-year-old children. These data are well suited to considering the consequences of maternal incarceration

[1] One possible reason to expect to see null effects of maternal incarceration is that many children will have already experienced enough stress prior to the incarceration that this event may actually relieve stress (e.g., Wheaton 1990).

for children for four reasons. First, many more children experienced maternal incarceration—287 of 3,330 (8.7 %) children with caregiver-reported outcomes, 178 of 2,173 (8.2 %) children with teacher-reported outcomes—than have in previous research. Huebner and Gustafson's (2007:286) analysis of the children of the National Longitudinal Study of Youth 1979 (NLSY79), for instance, included 26 ever-incarcerated mothers (2.1 % of their sample), and Hagan and Foster's (2012:48) analysis of the National Longitudinal Study of Adolescent Health (Add Health) included about 50 ever-incarcerated mothers (1.0 % of their sample).[2] Second, the Fragile Families data also measure paternal incarceration (e.g., Geller et al. 2012; Turney and Wildeman 2013; Wildeman 2010), making it possible to disentangle the effects of maternal and paternal incarceration. Third, these data include extensive measures of paternal and maternal traits, 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 9. Reports of behavioral problems 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 also reported on incarceration) and provides insight into how children behave in multiple contexts.

This strength bears more extensive discussion given that it relates directly to another contribution of our analysis. Of the quantitative 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, b; 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 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 into how maternal incarceration may affect children across the life course. By considering an array of 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

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

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 1, 3, 5, and 9 years old. When children were 9, researchers completed an in-home interview with the child's primary caregiver (the child's mother in 92.4 % of observations in our first analytic sample). For children whose biological parents were no longer their primary caregivers, the new primary caregiver—often a grandparent, an aunt, or an uncle—was interviewed. The caregiver answered questions about the focal child's behavioral problems. Also when children were 9, researchers administered 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 nonparental 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 and grandparents) reporting in some cases when the mother did not report (Bendheim-Thoman Center for Research on Child Wellbeing 2008, 2011).[3]

We use two analytic samples for our main analyses. The first, used to estimate children's caregiver-reported behavioral problems, includes 3,330 observations. Of the 4,898 observations in the FFCW baseline sample, we drop the 1,096 (22 %) observations that did not complete the nine-year in-home interview and an additional 472 (10 %) observations with incomplete information on any of the 11 caregiver-reported behavioral problems or maternal incarceration (both described in the next subsection). Consistent with prior research using FFCW, differences in observed variables between the analytic and baseline samples are small, suggesting that attrition by observed characteristics does not bias our results. Nonetheless, mothers in the analytic sample were significantly more likely to be non-Hispanic black, more likely to have smoked during pregnancy, less likely to be immigrants (as were fathers in the analytic sample), and less likely to have completed high school (as were the fathers in the analytic sample) ($p < .05$).

The second sample, used to estimate teacher-reported behavioral problems, includes 2,173 observations. 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. Several differences exist between the first and second analytic samples. Children in the second analytic sample, compared with the first, are 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 the maternal grandmother, and less likely to be married and more likely to have no relationship with each other. Mothers were also more likely to have been incarcerated before the one-year interview ($p < .05$).

[3] Cases in which neither biological parent is the primary caregiver reporting are rare, however. At the nine-year interview, this was the case for 132 children (Bendheim-Thoman Center for Research on Child Wellbeing 2011:5).

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. In the imputation model, we include variables related to the research questions or to the likelihood of being missing (Allison 2002).

Measures

Children's Behavioral Problems

We consider 11 indicators of caregiver-reported behavioral problems at age 9, all using the Child Behavior Checklist/6-18 (CBCL/6-18) (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 (α = .85), social (α = .73), rule-breaking (α = .77), somatic complaints (α = .76), thought (α = .78), internalizing (α = .86), externalizing (α = .91), and total (α = .93). We average responses for each scale and standardize each to have a mean of 0 and a standard deviation of 1.

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) (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 (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) (Gresham and Elliott 2007). 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 (α = .89), assertion (α = .87), self-control (α = .95), internalizing (α = .85), and externalizing (α = .93).[4] We also average responses for each teacher-reported 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,[5] (2) the primary caregiver at the nine-year interview was a nonparent

[4] These scales are not designed to be combined to generate a global measure (Conners 2001; Gresham and Elliott 2007).

[5] Mothers incarcerated before the one-year interview are not excluded from the analytic sample. They are considered to experience incarceration if we have direct or indirect confirmation of incarceration between the one- and nine-year interviews.

and reported that the child was placed in his/her care because of maternal incarceration, or (3) either the mother or father reported that the mother was currently incarcerated or had been incarcerated since the last interview at the three-, five-, or nine-year interviews. Paternal incarceration is coded similarly, although different questions were asked about maternal and paternal incarceration, so the exact indicators used to construct these measures differ. Of 9-year-old children in our analytic sample, 8.7 % had a mother incarcerated between ages 1 and 9. Having either parent spend time in prison or jail was common among children: 31.9 % experienced only paternal incarceration (and not maternal incarceration), 4.0 % experienced only maternal incarceration (and not paternal incarceration), and 4.7 % experienced both maternal and paternal incarceration.[6]

Although the measure of maternal incarceration is excellent in many regards—it is based on multiple (mother, father, and caregiver) reporters, 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, we cannot differentiate between prison and jail incarceration; these two types of incarceration differ significantly in terms of visitation policies and proximity to home, both of which are likely key moderators of the effects of maternal incarceration on children (e.g., Arditti 2012b). Finally, our measure assumes that 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.

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 incarceration. Because different information on incarceration is collected at each of the follow-up interviews, we include 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 nonparent). Demographic characteristics of the mother and father include race, immigrant status, age, and education. We also control for additional traits of the mother: whether she lived with both biological parents at age 15, income-to-poverty ratio, material hardship (e.g., borrowed money from friends or family to help pay the bills), whether she resides with the child's grandmother, relationship status with the child's father, relationship quality with the child's father, relationship with a new resident partner, number of children in the household, parenting stress, whether the mother was living with the child at the one-year interview, and maternal engagement with the child at the one-year interview. We

[6] In our sample, the overlap between maternal and paternal incarceration (with about one-half experiencing only maternal incarceration and about one-half experiencing both maternal and paternal incarceration) is less pronounced than in other work in this area that uses excellent, although not broadly representative, data. For example, 14 of the 15 cases (93 %) that Arditti et al. (2010) considered included both maternal and paternal incarceration. It is, however, consistent with other research using the FFCW data (e.g., Geller et al. 2009:1199).

also control for three child traits: gender, low birth weight, 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 with the focal child. Maternal substance abuse problem is measured by an affirmative response to any of the following: drinking or drugs interfered with day-to-day life; drinking or drugs interfered with personal relationships; and 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 statements: 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; and 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 dummy variables 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 main analyses proceed in five stages. In the first stage, we use data from the 2002 Survey of Inmates in Local Jails and the 2004 Survey of Inmates in State and Federal Correctional Facilities to show the similarities and differences between FFCW incarcerated mothers and women with young children currently incarcerated in local jails, state prisons, and federal prisons.

In the second 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 1 and 9 and those who did not. We also consider descriptive differences in these two groups across all control variables.

In the third analytic stage, we estimate a series of ordinary least squares (OLS) models that progressively adjust for characteristics that may alter the association between maternal incarceration and children's caregiver- and teacher-reported behavioral problems. The analyses proceed in a similar manner for caregiver- and teacher-reported behavioral problems. 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. In subsequent models, we adjust for a 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 similar paternal behaviors (Model 5).

In the fourth analytic stage, we implement propensity score models. Propensity score matching is one way to diminish concerns about preexisting 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. It is also useful given the relatively small number of children who had mothers incarcerated during this period ($n = 287$ for those with caregiver-reported measures, and $n = 178$ for those with teacher-reported measures). We generate a propensity score for each observation that estimates the probability of maternal incarceration on the basis of all controls included in the final models presented in the OLS models from the previous stage of the analysis. 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; we rely on an Epanechnikov kernel and a bandwidth of .006, although results were robust to using other kernel types, bandwidths, and model specifications.

Finally, in the fifth analytic stage, 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 correspond to those used in the third analytic stage.

Main Results

Descriptive Statistics

We first present descriptive statistics showing how incarcerated mothers in the FFCW compare with mothers currently incarcerated in local jails, state prisons, and federal prisons. These results, shown in Table 1, provide insight into how appropriate the FFCW data are for considering the effects of maternal incarceration on children. For nearly all the characteristics we consider, the FFCW mothers who experience incarceration are similar to mothers with small children who experience incarceration. Most consequentially, both types of mothers (1) are disproportionately black, ranging from 44.9 % for mothers in federal prisons to 55.7 % for FFCW mothers; (2) have similar levels of high school dropout, ranging from 36.2 % for mothers in federal prisons to 47.0 % for mothers in jails; and (3) are unlikely to be married, ranging from 14.9 % married for FFCW mothers to 37.2 % for mothers in federal prisons. Thus, FFCW incarcerated mothers are demographically similar to representative samples of incarcerated mothers according to Table 1, even though unobserved differences—such as varying criminal propensities—may exist.

Table 1 Descriptive statistics for recently incarcerated mothers in Fragile Families, compared with mothers in jails, state prisons, and federal prisons who have comparably aged children

	Fragile Families Mothers		Mothers in Jail		Mothers in State Prison		Mothers in Federal Prison	
	(2001–2002)		(2002)		(2004)		(2004)	
Variables	Mean or %	SD	Mean or %	SD	Mean or %	SD	Mean or %	SD
Race (%)								
Non-Hispanic white	21.0		29.0		24.2		13.6	
Non-Hispanic black	55.7		45.4		48.4		44.9	
Hispanic	20.3		20.0		21.0		32.6	
Non-Hispanic other race	3.1		5.6		6.4		9.0	
Foreign-born (%)	3.8		10.7		8.7		29.1	
Age	24.416	(5.797)	27.394	(6.035)	28.570	(6.920)	30.270	(6.852)
Education (%)								
Less than high school	43.0		47.0		44.0		36.2	
High school diploma or GED	32.6		43.3		44.9		41.9	
More than high school	24.4		9.6		11.1		21.9	
Married (%)	14.9		23.8		23.5		37.2	
N	287		382		686		164	

Notes: Descriptive statistics for Fragile Families mothers are from the one-year survey (e.g., when their children were approximately 1 year old). Descriptive statistics for mothers in jail come from the Survey of Inmates in Local Jails (2002) and are restricted to mothers with children between the ages of 1 and 9. Descriptive statistics for mothers in state prison come from the Survey of Inmates in State Correctional Facilities (2004) and are restricted to mothers with children ages 1 to 9. Descriptive statistics for mothers in federal prison come from the Survey of Inmates in Federal Correctional Facilities (2004) and are restricted to mothers with children between the ages of 1 and 9.

We next present descriptive differences between the FFCW mothers (and their children) who do experience incarceration and those who do not. We first show descriptive statistics of children's behavioral problems (Table 2). As noted earlier, 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 7 of the 11 caregiver-reported outcomes and all 10 of the teacher-reported outcomes, which is consistent with other research showing large descriptive differences between children with and those without incarcerated mothers (e.g., Cho 2009b:779; Huebner and Gustafson 2007:289).

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 with –0.015, $p < .01$). Children with incarcerated mothers also had more attention problems (0.155 compared with –0.015, $p < .01$), social problems (0.193 compared with –0.018, $p < .001$), rule-breaking problems (0.099 compared with –0.009, $p < .05$), thought problems (0.104, compared with –0.010, $p < .05$), externalizing

Table 2 Descriptive statistics of children's behavioral problems (standardized)

	Maternal Incarceration		No Maternal Incarceration	
Behavioral Problems	Mean	SD	Mean	SD
Caregiver-Reported[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	(1.048)	–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	(1.001)*
Total problems	0.124	(0.965)	–0.012	(1.002)*
Teacher-Reported[b]				
Oppositional problems	0.195	(1.044)	–0.017	(0.994)**
Cognitive problems/inattention	0.183	(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	(1.005)***
Self-control problems	0.337	(0.922)	–0.030	(1.001)***
Internalizing problems	0.110	(0.851)	–0.010	(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.

[a] Among children with valid caregiver-reported behavioral problems, 287 experienced maternal incarceration between the one- and nine-year surveys, and 3,043 did not.

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

*$p < .05$; **$p < .01$; ***$p < .001$

problems (0.143 compared with –0.014, $p < .05$), and total problems (0.124 compared with –0.012, $p < .05$). Children of incarcerated mothers were significantly disadvantaged across all teacher-reported behavioral problems. Furthermore, some of the differences in teacher-reported outcomes between children with and without incarcerated mothers are large, translating into between one-ninth (e.g., internalizing problems) and one-third (e.g., self-control problems) of a standard deviation difference.

Of course, the differences in behavioral problems between children with and without incarcerated mothers, significant and large as they are, 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 in many ways (Table 3). 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 finish high school, compared with 29 % of other mothers ($p < .001$). Recently incarcerated mothers were less likely to be married to the child's father (15 % compared with 30 %, $p < .001$) and had lower income-to-poverty ratios ($p < .001$) and greater material hardship ($p < .001$). They were also significantly less likely to be the caregiver who reported on children's behavioral problems (70 % compared with 95 %, $p < .001$). Differences in maternal behaviors are also striking. For example, 30 % of incarcerated mothers but only 11 % of other mothers reported using drugs or drinking alcohol while pregnant. Incarcerated mothers were also more likely to have a substance abuse problem ($p < .05$), to be depressed ($p < .05$), or to have been incarcerated before ($p < .05$). In addition, fathers who share children with incarcerated mothers, compared with other fathers, are disadvantaged in a variety of ways. For example, 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 ($p < .001$). Although 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 with 31 %, $p < .001$).

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 4, we present a series of regression models that gradually adjust for individual-level characteristics of mothers, fathers, and children.

Model 1, which adjusts only for whether both parents were missing at each of the interviews and which caregiver reported the children's behavioral problems, shows results somewhat dissimilar to the descriptive statistics presented in Table 2. For 1 of the 11 outcomes (social problems), children of incarcerated mothers have significantly more behavioral problems than their counterparts. However, when we adjust for demographic characteristics in Model 2, the association between maternal incarceration and social problems becomes small and statistically insignificant, diminishing by 71 % from Models 1 to 2 (0.052, nonsignificant). Although each of the maternal characteristics considered partially explains these reductions, more than one-half of the decline is explained by including mother's income-to-poverty ratio and material hardship, suggesting that the economic plight of incarcerated mothers alone explains much of the behavioral problems of their children.

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

Table 3 Descriptive statistics of additional variables used in analyses

	Full Sample		Maternal Incarceration		No Maternal Incarceration	
Variables	Mean or %	SD	Mean or %	SD	Mean or %	SD
Mother Incarceration (%)	8.7		100.0		0.0***	
Parental Incarceration (%)						
Both parents incarcerated	4.7		54.3		0.0***	
Only father incarcerated	31.9		0.0		34.9***	
Only mother incarcerated	4.0		45.7		0.0***	
Neither parent incarcerated	59.4		0.0		65.1***	
Both Parents Missing (%)						
One-year interview	4.5		1.7		4.8**	
Three-year interview	5.0		1.7		5.3**	
Five-year interview	4.5		3.8		4.6	
Nine-year interview	1.3		2.4		1.2*	
Caregiver Reporting (%)						
Mother	92.4		70.1		94.5***	
Father	3.9		16.8		2.7***	
Other	3.7		13.1		2.8***	
Mother Race (%)						
Non-Hispanic black	50.1		55.7		49.6*	
Non-Hispanic white	20.8		21.0		20.8	
Hispanic	25.6		20.3		26.1*	
Non-Hispanic other race	3.5		3.1		3.5	
Mother Immigrant (%)	13.7		3.8		14.6***	
Mother Age (mean)	25.035	(5.978)	24.416	(5.797)	25.094	(5.991)
Mother Education (%)						***
Less than high school	30.3		43.0		29.1***	
High school diploma or GED	28.7		32.6		28.3	
Post-secondary education	41.1		24.4		42.6***	
Mother Lived With Both Biological Parents at Age 15 (%)	41.3		30.3		42.3***	
Mother Income-to-Poverty Ratio (mean)	1.791	(2.204)	1.159	(1.286)	1.852	(2.264)***
Mother Hardship (mean)	1.168	(1.615)	1.855	(2.059)	1.102	(1.551)***
Mother Living With Child's Grandparent (%)	19.2		19.3		19.2	
Mother Relationship Status With Child's Father (%)						***
Married	28.4		14.9		29.7***	
Cohabiting	28.1		28.6		28.0	
Nonresidential romantic relationship	11.3		10.0		11.5	
No relationship	38.0		50.2		36.8***	
Mother Repartnered (%)	4.9		7.2		4.7	
Mother Relationship Quality (mean)	2.776	(1.396)	3.203	(1.402)	2.735	(1.389)***
Mother Number of Children in Household (mean)	2.308	(1.333)	2.558	(1.455)	2.283	(1.319)**
Mother Parenting Stress (mean)	2.221	(0.681)	2.347	(0.710)	2.209	(0.677)***

Table 3 (continued)

	Full Sample		Maternal Incarceration		No Maternal Incarceration	
Variables	Mean or %	SD	Mean or %	SD	Mean or %	SD
Mother Residing With Child (%)	98.4		95.3		98.6*	
Maternal Engagement (mean)	4.826	(1.511)	4.699	(1.603)	4.838	(1.502)*
Child Male (%)	52.5		54.0		52.4	
Father Race (%)						
Non-Hispanic black	52.1		58.4		51.5*	
Non-Hispanic white	18.1		15.8		18.3	
Hispanic	25.6		21.6		26.0	
Non-Hispanic other race	4.2		4.1		4.2	
Father Immigrant (%)	15.5		7.6		16.3	
Father Age (mean)	27.549	(7.197)	27.532	(7.653)	27.551	(7.152)
Father Education (%)						*
Less than high school	35.1		39.5		34.7	
High school diploma or GED	33.4		36.8		33.0	
Post-secondary education	31.5		23.7		32.2*	
Mother Smoked During Pregnancy (%)	19.3		45.0		16.8***	
Mother Used Drugs or Drank Alcohol During Pregnancy (%)	12.8		30.2		11.1***	
Mother Substance Abuse Problem (%)	1.4		4.1		1.1*	
Mother Self-control (mean)	3.472	(0.484)	3.277	(0.552)	3.491	(0.473)***
Mother Depressed (%)	15.6		20.9		15.1*	
Mother Prior Incarceration (%)	0.7		2.7		0.5*	
Child Born Low Birth Weight (%)	9.2		13.1		8.9*	
Child Temperament (mean)	0.568	(0.128)	0.553	(0.136)	0.569	(0.128)
Father Self-control (mean)	3.204	(0.807)	2.833	(0.870)	3.240	(0.792)***
Father Substance Abuse Problem (%)	18.4		32.0		17.1***	
Father Engaged In Domestic Violence (%)	7.9		21.8		6.6***	
Father Employed (%)	63.5		57.7		64.0*	
Father Prior Incarceration (%)	32.5		49.8		30.8***	
N	3,330		287		3,043	

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.

*$p < .05$; **$p < .01$; ***$p < .001$

Model 5, all but one of the maternal incarceration coefficients are negative, suggesting that the statistical insignificance is not driven by the relatively small number of incarcerated mothers. More interestingly, in the final model, maternal incarceration is associated with significantly fewer rule-breaking behaviors (–0.135; $p < .05$), showing that with respect to caregiver-reported problems, the limited evidence of unique effects suggests that maternal incarceration decreases rather than increases children's behavioral problems.

Table 4 Results from OLS regression models estimating children's caregiver-reported behavioral problems as a function of maternal incarceration

Caregiver-Reported Behavioral Problems	Model 1	Model 2	Model 3	Model 4	Model 5
Aggressive	0.109	–0.016	–0.016	–0.068	–0.091
	(0.063)	(0.063)	(0.063)	(0.064)	(0.064)
Withdrawn/Depressed	0.083	–0.006	0.005	–0.046	–0.042
	(0.064)	(0.064)	(0.064)	(0.065)	(0.065)
Anxious/Depressed	0.030	–0.023	–0.022	–0.041	–0.049
	(0.064)	(0.064)	(0.064)	(0.065)	(0.065)
Attention Problems	0.095	–0.014	–0.014	–0.047	–0.067
	(0.064)	(0.063)	(0.063)	(0.064)	(0.064)
Social Problems	0.178**	0.052	0.052	0.002	–0.009
	(0.064)	(0.064)	(0.064)	(0.064)	(0.065)
Rule-Breaking Behavior	0.057	–0.071	–0.072	–0.118	–0.135*
	(0.064)	(0.063)	(0.063)	(0.064)	(0.064)
Somatic Complaints	0.097	0.022	0.019	0.003	0.002
	(0.064)	(0.064)	(0.064)	(0.065)	(0.066)
Thought Problems	0.054	–0.038	–0.038	–0.072	–0.083
	(0.064)	(0.064)	(0.064)	(0.065)	(0.065)
Internalizing Problems	0.079	–0.004	–0.004	–0.034	–0.037
	(0.064)	(0.064)	(0.064)	(0.065)	(0.065)
Externalizing Problems	0.098	–0.036	–0.037	–0.090	–0.112
	(0.064)	(0.063)	(0.063)	(0.064)	(0.064)
Total Problems	0.098	–0.024	–0.024	–0.071	–0.086
	(0.064)	(0.064)	(0.064)	(0.064)	(0.065)
N	3,330	3,330	3,330	3,330	3,330

Notes: Each row comprises a separate regression model. Model 1 includes only maternal incarceration as well as information on when (if ever) both parents were missing from any survey wave and 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, whether the mother was living with the child, maternal engagement, 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 are in parentheses.

*$p < .05$; **$p < .01$;

Estimating Effects on Teacher-Reported Behavioral Problems

We consider the association between maternal incarceration and teacher-reported behavioral problems in Table 5, and these models progress in the same manner as

Table 5 Results from OLS regression models estimating children's teacher-reported behavioral problems as a function of maternal incarceration

Teacher-Reported Behavioral Problems	Model 1	Model 2	Model 3	Model 4	Model 5
Oppositional Problems	0.189*	0.090	0.094	0.072	0.056
	(0.081)	(0.079)	(0.079)	(0.079)	(0.080)
Cognitive Problems/Inattention	0.155	0.020	0.026	0.014	0.025
	(0.081)	(0.079)	(0.079)	(0.080)	(0.080)
Hyperactivity	0.181*	0.095	0.098	0.081	0.060
	(0.081)	(0.079)	(0.079)	(0.079)	(0.080)
ADHD	0.182*	0.073	0.079	0.062	0.045
	(0.081)	(0.078)	(0.078)	(0.078)	(0.079)
Cooperation Problems	0.239**	0.120	0.128	0.103	0.081
	(0.081)	(0.077)	(0.077)	(0.078)	(0.079)
Social Problems	0.220**	0.101	0.106	0.096	0.078
	(0.081)	(0.079)	(0.079)	(0.080)	(0.081)
Assertion Problems	0.261***	0.135	0.141	0.118	0.106
	(0.081)	(0.079)	(0.079)	(0.079)	(0.080)
Self-control Problems	0.330***	0.206**	0.212**	0.189*	0.166*
	(0.081)	(0.077)	(0.077)	(0.078)	(0.079)
Internalizing Problems	0.096	0.004	0.005	0.003	-0.006
	(0.082)	(0.082)	(0.082)	(0.083)	(0.084)
Externalizing Problems	0.252**	0.148*	0.154*	0.141	0.121
	(0.081)	(0.078)	(0.078)	(0.078)	(0.079)
N	2,173	2,173	2,173	2,173	2,173

Notes: Each row comprises a separate regression model. Model 1 includes only maternal incarceration, as well as information on when (if ever) both parents were missing from any survey wave and 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, whether the mother was living with the child, maternal engagement, 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 are in parentheses.

*$p < .05$; **$p < .01$; ***$p < .001$

those presented in Table 4. Model 1 shows that maternal incarceration is associated with all but two teacher-reported outcomes. After adjusting for maternal demographic characteristics in Model 2, all maternal incarceration coefficients are reduced in size, ranging from a 38 % decrease (self-control) to a 96 % decrease (internalizing). Additionally, with the exception of self-control and externalizing, all maternal incarceration coefficients fall to insignificance, suggesting that these traits account for the association between maternal incarceration and teacher-reported behavioral problems.

In the remainder of Table 5, 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 4, our results show that the relationship between maternal incarceration and children's behavioral problems is null for 19 of 21 outcomes, negative for one outcome (self-control), and positive for one outcome (rule-breaking), suggesting that the average effects of maternal incarceration are null.

Propensity Score Models

We further consider the relationship between maternal incarceration and children's behavioral problems with propensity score models (Table 6), which provide a more rigorous test of this relationship by matching children who experience maternal incarceration and those who do not. These results show that with two exceptions, maternal incarceration is not associated with caregiver- and teacher-reported behavioral

Table 6 Results from propensity score matching models estimating the consequences of maternal incarceration for children's caregiver- and teacher-reported behavioral problems

Behavioral Problems	Coefficient	SE	*t* Statistic
Caregiver-Reported			
Aggressive	–0.056	(0.071)	–0.79
Withdrawn/depressed	0.002	(0.070)	0.03
Anxious/depressed	0.003	(0.068)	0.05
Attention problems	–0.057	(0.071)	–0.81
Social problems	0.041	(0.072)	0.57
Rule-breaking behavior	–0.136	(0.064)	–2.11*
Somatic complaints	0.040	(0.071)	0.56
Thought problems	–0.046	(0.069)	–0.66
Internalizing problems	0.018	(0.069)	0.26
Externalizing problems	–0.088	(0.069)	–1.28
Total problems	–0.044	(0.068)	–0.65
Teacher-Reported			
Oppositional problems	0.082	(0.092)	0.89
Cognitive problems/inattention	0.000	(0.087)	0.00
Hyperactivity	0.045	(0.092)	0.49
ADHD	0.023	(0.091)	0.25
Cooperation problems	0.082	(0.086)	0.94
Social problems	0.090	(0.082)	1.10
Assertion problems	0.108	(0.083)	1.30
Self-control problems	0.172	(0.084)	2.05*
Internalizing problems	–0.017	(0.080)	–0.21
Externalizing problems	0.147	(0.088)	1.67

Note: Propensity score models use kernel matching. Standard errors are in parentheses.

*$p < .05$

problems. The two significant outcomes go in opposite directions, with results suggesting beneficial effects for one outcome (caregiver-reported rule-breaking behaviors) and deleterious effects for another (teacher-reported self-control). Overall, consistent with Tables 4 and 5, the propensity score models suggest that the association between maternal incarceration and children's behavioral problems is null. Also consistent with Tables 4 and 5, the coefficients are small; thus, this null relationship is not driven by sample size.

Considering Effects of Maternal and Paternal Incarceration Simultaneously

Finally, in Table 7, we consider the combination of maternal and paternal incarceration. We turn first to caregiver-reported behavioral problems. Maternal incarceration, whether only the mother or both the mother and the father experience incarceration, is not significantly associated with any of the 11 caregiver-reported behavioral problems after we include the full range of controls from Model 5 of Tables 4 and 5; the same is true of having both parents incarcerated. However, paternal incarceration, compared with no parental incarceration, is associated with more behavioral problems. Paternal incarceration is a significant predictor for all outcomes except somatic complaints.

We turn next to teacher-reported behavioral problems. Children who experienced maternal incarceration, compared with those with no parental incarceration, are disadvantaged only in their self-control problems ($p < .05$) after we include the full range of controls from Model 5 of Tables 4 and 5. Additionally, paternal incarceration is associated with some teacher-reported behavioral problems. Paternal incarceration, compared with no parental incarceration, is associated with more oppositional (0.154, $p < .01$), hyperactivity (0.143, $p < .05$), ADHD (0.109, $p < .05$), social (0.172, $p < .001$), assertion (0.127, $p < .05$), self-control (0.130, $p < .05$), internalizing (0.113, $p < .01$), and externalizing problems (0.166, $p < .01$). Furthermore, experiencing both maternal and paternal incarceration is consequential for children's teacher-reported behavioral problems because these children, compared with those experiencing no parental incarceration, are significantly more hyperactive (0.293, $p < .01$), exhibit more ADHD behaviors (0.281, $p < .01$), and have more externalizing behaviors (0.224, $p < .05$). These substantial and significant associations provide far stronger evidence that having both parents incarcerated increases behavioral problems than that maternal incarceration has any independent effect on behavioral problems. Indeed, as with the previous analyses, we find only limited evidence of an independent effect of maternal incarceration, although some of the maternal incarceration coefficients are large enough to merit further investigating despite their insignificance.

Supplementary Results

Robustness Checks

In a series of robustness checks, we also considered how the following affects results presented in the previous section: (1) limiting the analytic samples to only those families in which at least one parent participated in additional surveys beyond the baseline and nine-year in-home interviews, (2) using ordered logistic regression instead

Table 7 Results from OLS regression models estimating children's caregiver- and teacher-reported behavioral problems as a function of maternal and paternal incarceration

	Parental Incarceration		
Behavioral Problems	Both	Only Father	Only Mother
Caregiver-Reported			
Aggressive	0.016	0.209***	0.008
	(0.087)	(0.044)	(0.092)
Withdrawn/depressed	–0.007	0.147***	0.076
	(0.089)	(0.044)	(0.093)
Anxious/depressed	0.051	0.127**	–0.031
	(0.088)	(0.044)	(0.093)
Attention problems	0.014	0.234***	0.090
	(0.086)	(0.043)	(0.091)
Social problems	0.051	0.151***	0.083
	(0.087)	(0.044)	(0.092)
Rule-breaking behavior	–0.037	0.194***	–0.041
	(0.087)	(0.044)	(0.092)
Somatic complaints	0.051	0.073	0.023
	(0.089)	(0.045)	(0.094)
Thought problems	0.020	0.188***	–0.001
	(0.088)	(0.044)	(0.093)
Internalizing problems	0.044	0.136**	0.016
	(0.088)	(0.044)	(0.093)
Externalizing problems	–0.001	0.218***	–0.009
	(0.086)	(0.043)	(0.091)
Total problems	0.022	0.199***	0.002
	(0.087)	(0.044)	(0.092)
Teacher-Reported			
Oppositional problems	0.175	0.154**	0.077
	(0.108)	(0.053)	(0.116)
Cognitive problems/inattention	0.199	0.044	–0.142
	(0.108)	(0.054)	(0.116)
Hyperactivity	0.293**	0.143**	–0.074
	(0.108)	(0.053)	(0.116)
ADHD	0.281**	0.109*	–0.129
	(0.106)	(0.053)	(0.114)
Cooperation problems	0.152	0.057	0.055
	(0.106)	(0.052)	(0.113)
Social problems	0.180	0.172***	0.139
	(0.109)	(0.054)	(0.116)
Assertion problems	0.143	0.127*	0.198
	(0.108)	(0.054)	(0.116)

Table 7 (continued)

Behavioral Problems	Parental Incarceration		
	Both	Only Father	Only Mother
Self-control problems	0.201	0.130*	0.265*
	(0.106)	(0.052)	(0.114)
Internalizing problems	0.058	0.113**	0.038
	(0.113)	(0.056)	(0.121)
Externalizing problems	0.224*	0.166**	0.175
	(0.107)	(0.053)	(0.114)

Notes: Each row comprises a separate regression model. Models include all controls from Model 5 of Tables 4 and 5. Standard errors are in parentheses.

*$p < .05$; **$p < .01$; ***$p < .001$

of OLS (and coding our dependent variables so that they are ordinal, as opposed to recoding and standardizing them), (3) limiting all analyses to children having nonmissing data on all teacher- and caregiver-reported measures of behavioral problems, and (4) using a narrower incarceration measure. The results are available upon request.

We first discuss the robustness checks that suggested our analytic strategy had no influence on the results. Neither limiting the analytic samples to only families in which at least one parent participated in the one-, three-, or five-year interviews nor using an ordered logistic regression model instead of an OLS regression model affected the results in any noteworthy way.

Analyses that (1) considered the effects of maternal incarceration for caregiver-reported behavioral problems using the second analytic sample and (2) used a narrower measure of maternal incarceration differed in some ways from presented results. First, in results using the second analytic sample for estimates of caregiver-reported behavioral problems, maternal incarceration was associated with significant decreases in 4 of the 11 outcomes. Second, in a separate robustness check, we constructed a measure that considered mothers to have been incarcerated only if we had direct or indirect evidence that they were incarcerated during that period; therefore, they were not considered incarcerated if they switched from never-incarcerated to ever-incarcerated with no additional direct or indirect confirmation. Using this more conservative measure, 4 of 10 teacher-reported behavioral problems were associated with significantly more behavioral problems. Taken together, altering our analyses in these ways would have led us to conclude that maternal incarceration is associated with significantly more behavioral problems (for the narrower incarceration measure) or fewer behavioral problems (for the limited sample); this is consistent with the main analyses, suggesting that there is no robust, significant association between maternal incarceration and children's behavioral problems.

Moderators

In addition to these robustness checks, we also considered three theoretically interesting moderators of the relationship between maternal incarceration and children's behavioral problems: (1) child sex; (2) maternal residence and engagement; and (3) race/ethnicity.

In terms of sex-specific effects, for 0 of the 21 outcomes that we considered, boys and girls responded significantly differently to maternal incarceration. However, the interaction coefficient was more often (although not always) in the direction of worse effects for boys.

In terms of maternal residence and engagement, it is vital to note that all research in this regard focuses on family life immediately before incarceration (e.g., Hanlon et al. 2005a, b), which we cannot measure because too few mothers were incarcerated between each of the survey waves. Instead, we measured these features of family life at the one-year interview and ran two sets of analyses. First, we included interactions between maternal incarceration and (1) maternal residence and (2) maternal engagement, finding insignificant and small coefficients for the interaction term in both cases. Second, we limited the sample to mothers living with their children at the one-year interview, finding results consistent with what we found in the full sample. Thus, we find no evidence that maternal pre-incarceration residence or engagement moderate these effects.

In Table 8, we also consider how race/ethnicity moderates this relationship by replicating the full models shown in Tables 4 and 5 for non-Hispanic black, Hispanic, and non-Hispanic white mothers. Results show no significant effects of maternal incarceration on children for blacks, which is consistent with our broader story. For Hispanics, there is one significant effect, with these children responding to maternal incarceration with 0.483 standard deviations more somatic complaints than their counterparts ($p < .01$). There are nearly significant but substantial consequences for internalizing behaviors among Hispanics, according to both caregiver (0.281) and teacher (0.335) reports, indicating that in a larger sample, children of incarcerated Hispanic mothers might experience a resulting increase in internalizing behaviors. Finally, for whites, maternal incarceration is associated with significantly fewer caregiver-reported aggressive (–0.357), attention (–0.306), social (–0.307), rule-breaking (–0.376), thought (–0.270), internalizing (–0.278), externalizing (–0.385), and total (–0.370) behavioral problems, strongly suggesting that maternal incarceration may actually enhance child well-being for white children—at least according to caregiver reports. Although this finding may seem surprising to some, we find it broadly consistent with the argument that the more select the mothers who experience incarceration, the more likely the positive effects on children. Because white women are far less likely to experience incarceration than black women (Wildeman 2009), we would expect their incarceration to be least harmful—and maybe helpful—to the children they leave behind.

Testing for Effects at Age 5

In the final stage of our supplementary analyses, we show how maternal incarceration between ages 1 and 5 shapes children's caregiver-reported behavioral problems at age 5. For this stage of the analysis, we present only caregiver-reported problems available in both the five- and nine-year data. Teacher reports were not included in the five-year interview. As with our main analyses, and consistent with prior research on the dramatic behavioral problems of children with incarcerated mothers, descriptive results from Table 9 suggest that these children, compared with others, exhibit significantly more behavioral problems at age 5 on seven of the eight measures.

In Table 10, we present results from models paralleling the final model shown in Table 4 (where we consider maternal incarceration only) as well as the models

Table 8 Results from OLS regression models estimating children's caregiver- and teacher-reported behavioral problems as a function of maternal incarceration for blacks, Hispanics, and whites

	Race/Ethnicity		
Behavioral Problems	Black	Hispanic	White
Caregiver-Reported			
Aggressive	–0.057	0.157	–0.357*
	(0.089)	(0.132)	(0.149)
Withdrawn/depressed	–0.018	0.124	–0.164
	(0.087)	(0.151)	0.140
Anxious/depressed	0.034	0.114	–0.306
	(0.081)	(0.154)	(0.160)
Attention problems	–0.091	0.154	–0.306*
	(0.086)	(0.137)	(0.152)
Social problems	–0.015	0.259	–0.307*
	(0.086)	(0.144)	(0.144)
Rule-breaking behavior	–0.130	0.014	–0.376***
	(0.094)	(0.147)	(0.111)
Somatic complaints	–0.095	0.483**	–0.196
	(0.093)	(0.155)	(0.114)
Thought problems	–0.113	0.173	–0.270*
	(0.088)	(0.153)	(0.134)
Internalizing problems	–0.025	0.281	–0.278*
	(0.087)	(0.156)	(0.130)
Externalizing problems	–0.086	0.115	–0.385**
	(0.090)	0.137	(0.137)
Total problems	–0.064	0.208	–0.370**
	(0.089)	(0.147)	(0.131)
N	1,668	853	694
Teacher-Reported			
Oppositional problems	0.130	–0.240	0.107
	(0.138)	(0.136)	(0.127)
Cognitive problems/inattention	0.004	–0.015	0.083
	(0.120)	(0.182)	(0.153)
Hyperactivity	0.014	–0.157	0.239
	(0.128)	(0.152)	(0.159)
ADHD	–0.004	–0.120	0.170
	(0.121)	(0.162)	(0.158)
Cooperation problems	0.114	–0.081	0.197
	(0.114)	(0.173)	(0.159)
Social problems	0.064	0.096	0.039
	(0.130)	(0.159)	(0.145)
Assertion problems	0.166	0.014	0.155
	(0.118)	(0.170)	(0.167)

Table 8 (continued)

	Race/Ethnicity		
Behavioral Problems	Black	Hispanic	White
Self-control problems	0.224	–0.135	0.361*
	(0.119)	(0.165)	(0.159)
Internalizing problems	–0.115	0.335	–0.143
	(0.123)	(0.181)	(0.171)
Externalizing problems	0.187	–0.125	0.171
	(0.134)	(0.142)	(0.134)
N	1,038	538	519

Notes: Each row comprises a separate regression model. Models include all controls from Model 5 of Tables 4 and 5. Standard errors are in parentheses.

*$p < .05$; **$p < .01$; ***$p < .001$

presented in Table 7 (where we consider parental incarceration more broadly). In terms of maternal incarceration, the results are remarkably consistent with the results displayed in Table 4. In the results considering parental incarceration more broadly, however, the pattern is slightly different: we find no significant effects of experiencing both paternal and maternal incarceration, but experiencing only maternal incarceration is associated with a statistically significant—and substantial—increase in children's withdrawn/depressed behaviors. Experiencing only paternal incarceration is associated with significant increases in aggressive, externalizing, and total behavioral problems among young children. Thus, the results from Table 10 are consistent with our main results, although they suggest that maternal incarceration may increase the withdrawn/

Table 9 Descriptive statistics of children's behavioral problems at five years (standardized)

	Maternal Incarceration		No Maternal Incarceration	
Caregiver-Reported Behavioral Problems[a]	Mean	SD	Mean	SD
Aggressive	0.276	(1.018)	–0.022	(0.995)***
Withdrawn/Depressed	0.265	(1.084)	–0.009	(0.942)***
Anxious/Depressed	0.113	(1.017)	–0.009	(0.998)
Attention Problems	0.236	(1.051)	–0.019	(0.993)***
Social Problems	0.248	(1.039)	–0.019	(0.994)***
Internalizing Problems	0.188	(1.078)	–0.015	(0.992)**
Externalizing Problems	0.301	(1.027)	–0.024	(0.994)***
Total Problems	0.298	(1.027)	–0.023	(0.994)***

Note: Asterisks indicate significance levels based on two-sided *t* tests comparing children who experienced maternal incarceration and children who did not.

[a] Among children with valid caregiver-reported behavior problems, 197 experienced maternal incarceration between the one- and five-year surveys, and 2,508 did not.

**$p < .01$; ***$p < .001$

Table 10 Results from OLS regression models estimating children's caregiver-reported behavioral problems at age 5 as a function of parental incarceration

		Parental Incarceration		
Caregiver-Reported Behavioral Problems	Maternal	Both	Only Father	Only Mother
Aggressive	–0.007	0.081	0.108*	–0.001
	(0.073)	(0.106)	(0.049)	(0.098)
Withdrawn/Depressed	0.112	–0.002	0.055	0.253**
	(0.072)	(0.103)	0.048	(0.096)
Anxious/Depressed	–0.057	–0.155	0.025	0.047
	(0.074)	(0.108)	(0.050)	(0.099)
Attention Problems	0.029	0.103	0.076	0.023
	(0.075)	(0.108)	(0.050)	(0.099)
Social Problems	0.082	0.040	0.030	0.142
	(0.075)	(0.109)	(0.050)	(0.100)
Internalizing Problems	0.004	–0.117	0.045	0.143
	(0.074)	(0.107)	(0.049)	(0.099)
Externalizing Problems	0.006	0.087	0.109*	0.020
	(0.073)	(0.106)	(0.049)	(0.098)
Total Problems	0.010	0.014	0.098*	0.081
	(0.073)	(0.105)	(0.048)	(0.097)
N	2,705	2,705	2,705	2,705

Notes: Results for the Maternal column are based on a model that included only maternal incarceration. Results from the Both, Only Father, and Only Mother columns are based on a model including all three measures of parental incarceration simultaneously. All models include the full controls shown in Model 5 of Tables 4 and 5. Standard errors are in parentheses.

*$p < .05$; **$p < .01$

depressed behaviors of younger children, although they have no effect on these behaviors at age 9.

Discussion

In this article, we extended research on the consequences of mass imprisonment for children and the causes of inequality in child well-being by providing a uniquely strong and broad test of the consequences of maternal incarceration for children's well-being and development. We used data from the Fragile Families and Child Wellbeing Study and a series of OLS and propensity score models to consider the effects of maternal incarceration on 21 caregiver- and teacher-reported child behavioral problems. These data are uniquely suited to this task because of (1) the large number and proportion of mothers who experience incarceration, (2) the inclusion of information about paternal incarceration, (3) the vast array of potentially confounding variables, and (4) the measurement of well-established caregiver- and teacher-reported behavioral problems.

Results provide support for three conclusions. First, children of incarcerated mothers experience a host of disadvantages relative to other children (Table 3) and exhibit very high levels of behavioral problems (Tables 2 and 9), consistent with existing qualitative (e.g., Arditti 2012a; Giordano 2010; Siegel 2011) and quantitative (e.g., Cho 2009a, b; Hagan and Foster 2012) research on children of incarcerated mothers. Indeed, given the descriptive differences between children with and those without incarcerated mothers, it is no surprise that much research has focused primarily on highlighting the marginalization of these children (e.g., Arditti 2012a).

Second, although our descriptive findings are consistent with nearly all related previous research, our findings linking maternal incarceration to children's behavioral problems diverge from the branch of existing research suggesting that maternal incarceration is a key contributor to the problems these children face. Results from OLS and propensity score models strongly suggest that the average effects of maternal incarceration on children's behavioral problems are more often null than positive or negative (Tables 4, 5, 6, and 10). Despite reasons to expect maternal incarceration to have positive (e.g., Siegel 2011:76–93) or negative (e.g., Arditti 2012a) effects, our analyses suggest that the effects—at least for the young children in our sample—are instead null, which is consistent with arguments about selection made by criminologists (e.g., Giordano 2010:147–150; Sampson 2011) and econometric analyses of the consequences of maternal incarceration for children (e.g., Cho 2009a, b). These null effects were not uniform, however: children of non-Hispanic white incarcerated mothers displayed significantly fewer caregiver-reported behavioral problems than their counterparts without incarcerated mothers, and non-Hispanic black and Hispanic children of incarcerated mothers generally followed the pattern of null results (Table 8). This finding is especially interesting given that many accounts most skeptical of maternal incarceration's negative effects come from samples in which non-Hispanic whites are the majority (e.g., Giordano 2010:39; Phillips et al. 2006:683), and those that find harmful effects are drawn from communities with greater representations of non-Hispanic blacks and Hispanics (e.g., Arditti et al. 2010:146). This implies that researchers studying the consequences of maternal incarceration for children must be attentive both to whom their sample is representative of and the selectivity of the incarcerated women in their sample.

A final conclusion, gleaned from our analysis of the joint effects of paternal and maternal incarceration (Table 7), is that although maternal incarceration is rarely independently associated with significant differences in children's behavioral problems (1 of 21 outcomes), paternal incarceration is associated with substantially and significantly more behavioral problems. The second part of this finding is consistent with prior research on the consequences of paternal incarceration for young children. This existing research shows that even after adjusting for a host of background characteristics, some observed and some unobserved, paternal incarceration is robustly associated with deleterious outcomes for young children (e.g., Geller et al. 2012; Wakefield and Wildeman 2011; Wildeman 2010). For 18 of 21 outcomes considered, paternal incarceration was associated with significantly greater behavioral problems, suggesting that the null effects of maternal incarceration are not an artifact of our analytic strategy or sample. There were signs, however, that experiencing both maternal and paternal incarceration is linked with significantly more teacher-reported behavioral problems. Thus, maternal incarceration is detrimental to children's behavior only when the father was also incarcerated in the last eight years.

Our findings in regard to the differences between (1) the effects of paternal and maternal incarceration and (2) the effects of maternal incarceration for whites and non-Hispanic blacks are intriguing and bear additional discussion. Specifically, when combined with estimates of the cumulative risk of parental imprisonment (e.g., Wildeman 2009), these effects suggest that the selectivity of the incarcerated parent may moderate the effect of parental incarceration: the more select the parent experiencing incarceration, the more likely that event is to help (or at least not harm) the child; the less select the parent experiencing incarceration, the more likely it is to harm the child. The incarceration of fathers, for whom this event is now common, does their children substantial harm; the incarceration of all mothers and non-Hispanic black mothers, for whom this event is less common, has no consistent effects on their children; and the incarceration of white mothers, for whom this event is tremendously uncommon, may help their children. Thus, despite consistent claims that the effects of maternal incarceration may dramatically outweigh the effects of paternal incarceration, it instead appears that because the mothers—and especially the white mothers—who enter prisons and jails are so select on a host of traits likely to do their children harm, their absence may (somewhat paradoxically) matter least for their children.

Although these findings are provocative, our study nonetheless has a series of limitations. First, because we lack an exogenous shock in maternal incarceration—a shift in the risk of maternal incarceration not associated with the usual factors that lead to incarceration—it remains unclear whether we have identified a true null effect. Second, nonrandom attrition may also provide an obstacle. 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). Third, findings from our robustness checks suggest that we would have reached different conclusions if we considered only the results from one of those checks. Ultimately, this is a small limitation because the sign and significance of our findings so easily change, which reinforces our argument that these effects are most accurately characterized as null. Fourth, our results are limited to 5- and 9-year-old children, making it difficult to know how they relate to other work in this area that has found significant negative effects on adolescents (Hagan and Foster 2012), even if our results are consistent with other research finding null effects on children (Cho 2009b). Fifth, we were unable to control for the negative parenting behaviors, such as neglect, that might link maternal incarceration to poor child outcomes (Thornberry et al. 2003). Sixth, the results for caregiver-reported behavioral problems often suggested maternal incarceration may improve children's outcomes (although not significantly so), whereas teacher-reported behavioral problems often suggested that maternal incarceration may harm them (again, not significantly so), leaving it for debate whether children with incarcerated mothers behave worse in school or teachers are more biased against these children. Nonetheless, we expect the latter to be the cause in light of strong experimental research showing that maternal incarceration substantially and statistically significantly decreases teacher expectations of their students, implying bias (Dallaire et al. 2010). Finally, and most importantly, our data—although well suited for considering how time-invariant factors moderate the effects of maternal incarceration—are poorly suited for considering how time-varying factors moderate these effects because few mothers experience incarceration between any two waves. Understanding these time-varying moderators is an important direction for future research.

Limitations aside, these conclusions have key implications for research on the effects of mass imprisonment on family life, the factors that shape social inequalities in child well-being, and the well-being of the children of incarcerated mothers. Most importantly, because 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. Indeed, they suggest that the effects of mass imprisonment on family life include a combination of positive, negative, and null effects (e.g., Turney and Wildeman 2013). This stands in stark contrast to some previous research finding massive effects of maternal incarceration on children (e.g., Huebner and Gustafson 2007) and implies that after we adjust for selection into incarceration, there may be no effect of maternal incarceration on children's behavior. Finally and most importantly, our findings suggest that the children of incarcerated mothers are an incredibly vulnerable group—even if, as suggested by others (e.g., Giordano 2010; Johnston 2006), maternal incarceration may not be a cause of those ills. Given the disadvantage these children face and the minimal effects maternal incarceration may have on them, we suggest the implementation of policies that focus not just on the effects of maternal incarceration on children but also on interventions that occur prior to incarceration because such programs may most enhance child well-being and, therefore, diminish inequalities. Merely reducing rates of maternal imprisonment, on the other hand, is unlikely to do so.

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