Despair by Association?
The Mental Health of Mothers with Children by Recently Incarcerated Fathers[1]

Christopher Wildeman
Yale University

Jason Schnittker
University of Pennsylvania

Kristin Turney
University of Michigan

03.02.2011

Word Count: 13,546

[1] Direct mail to Christopher Wildeman, Yale University, Department of Sociology, PO Box 208265, New Haven, CT 06520. Direct email to christopher.wildeman@yale.edu. Funding for this research was provided by postdoctoral fellowships from the Robert Wood Johnson Foundation Health & Society Scholars Program to Wildeman and Turney and a Robert Wood Johnson Foundation Investigator Award in Health Policy Research to Schnittker. We are grateful to Hedy Lee and the *ASR* reviewers and editors for helpful feedback on an earlier version of this manuscript.

ABSTRACT

A burgeoning literature considers the consequences of mass imprisonment for the well-being of adult men and—albeit to a lesser degree—their children. Yet virtually no quantitative research considers the consequences of mass imprisonment for the well-being of the women who form the link between (former) prisoners and their children. This article extends research by considering the association between recent paternal incarceration and maternal depression and life dissatisfaction using longitudinal data from the Fragile Families and Child Wellbeing Study. Results show that recent paternal incarceration increases a mother's risk of a major depressive episode and her level of life dissatisfaction, net of a variety of influences including prior mental health. Furthermore, the empirical design lends confidence to a causal interpretation. For one, these effects persist—and even intensify—when the sample is limited to mothers attached to ever-incarcerated men, providing a stronger empirical test of the relationship and suggesting particularly strong effects of having a partner churn through the penal system. The empirical design is also comprehensive in that, after isolating key mechanisms anticipated in the extant literature, we reduce the relationship between paternal incarceration and maternal mental health dramatically and to statistical insignificance. Taken together, these results imply that the penal system may have important effects on the well-being of poor women beyond increasing their economic insecurity, compromising their marriage markets, or magnifying their risk of divorce.

Although inequalities in family life have long existed in the United States (DuBois [1899] 1996; Liebow [1967] 2003; Patterson 1998; Stack 1974; Office of Policy Planning and Research, U.S. Department of Labor 1965), these inequalities have increased dramatically since the 1960s (Cherlin 2010; Ellwood and Jencks 2004; McLanahan 2004), embodied most notably in rising socioeconomic inequalities in family instability, especially single parenthood and nonmarital fertility. Despite a substantial body of research documenting the rise of family instability, its root causes are still up for debate (Ellwood and Jencks 2004:60), as are its consequences for mothers and children (Amato, Loomis, and Booth 1995; Cherlin 1999; Fomby and Cherlin 2007; Jaffee et al. 2003; McLanahan and Sandefur 1994; Meadows, McLanahan, and Brooks-Gunn 2008). Part of the explanation for these increases in inequalities in family instability may lie in the declining economic prospects of minority and poorly-educated men, suffering from deindustrialization and the resulting poor local labor market conditions (e.g., Lichter et al. 1992; Wilson 1987). But despite how these trends have been characterized by researchers, the poor economic prospects of marginal men may have other implications for family life that have not been widely considered.

In this vein, some scholars have drawn explicit connections between deindustrialization, urban joblessness, and the onset of mass imprisonment (Wacquant 2001:105; Western 2006:78). Imprisonment is now sufficiently common among poorly educated and minority men to represent a fundamental reorientation of the life course for these men (Pettit and Western 2004), damaging their economic prospects (Pager 2003; Western 2002, 2006), health (Massoglia 2008; Schnittker and John 2007), and union stability (Lopoo and Western 2005). Incarceration might affect others as well. In particular, it may undermine the well-being of the family members inmates leave behind. This possibility could put incarceration squarely within the family instability literature, but at this point far more is known about the effects of families on crime (Laub, Nagin, and

Sampson 1998; Laub and Sampson 2001; Sampson and Laub 1990, 1993; Warr 1998) than the effects of crime and incarceration on families (Comfort 2007; Hagan and Dinovitzer 1999). Some research considers the effects of paternal incarceration on children (Comfort 2007; Geller et al. 2009, *Forthcoming*; Hagan and Dinovitzer 1999; Murray and Farrington 2008; Wakefield and Uggen 2010; Wakefield and Wildeman *Forthcoming*; Wildeman 2010; Wildeman and Western 2010), but little research examines the mothers of these children, who are perhaps more immediately subject to the spillover effects of incarceration and, moreover, form a crucial link between these men and their children (Carlson, McLanahan, and Brooks-Gunn 2008).

The nature of these spillover effects is unclear, even regarding its direction. A small number of qualitative studies of parents suggests that the incarceration of fathers diminishes the well-being of mothers (Braman 2004a; Comfort 2008; Daniel and Barrett 1981; Fishman 1990; Lowenstein 1984; Morris 1965; Nurse 2002; Schwartz and Weintraub 1974).[2] There are good reasons for this relationship. Incarceration involves, at a minimum, a forced separation from partners and often sharply diminished socioeconomic resources, both during and after a sentence (Geller, Garfinkel, and Western 2011; Swisher and Waller 2008). Incarceration also involves considerable stigma, much of which spreads to those associated with inmates (Braman 2004a). In these ways, the effects of paternal incarceration on mothers may be a direct extension of the effects of incarceration on the incarcerated men. But the parallels are imperfect and it remains unclear whether the consequences for mothers are as overwhelmingly negative as research suggests they are for fathers. Even apart from whether the father is abusive, some mothers express relief when a difficult or distant father is incarcerated (Comfort 2008). Some also use the event as a turning point, realizing a new sense of independence and purpose (Edin, Nelson, and

[2] Not all of these studies consider only parents, but the majority of couples studied have children together.

Paranal 2004; Nurse 2002). The consequences of incarceration are asymmetric between mothers and fathers in other ways as well. For example, some mothers re-partner (Nurse 2002) and, thereby, shed the stigma of incarceration in ways that are nearly impossible for former inmates.

To fully understand how paternal incarceration affects the well-being of the women with whom they have children, especially within a mix of complex and countervailing influences, it is important to consider the characteristics of the mother, the inmate, and their relationship, all in the context of a longitudinal design that allows for sequential analysis. To our knowledge, no study has done these things completely. Most research employs select samples, such as juveniles (Nurse 2002) or women who visit their incarcerated partners often (Comfort 2008), or is taken from contexts with very different incarceration patterns than those currently found in the United States (e.g., Morris 1965; Lowenstein 1984). Moreover, quantitative research in this area has focused more on the effects of incarceration on women's marriage markets (Charles and Luoh 2010), union stability (Lopoo and Western 2005), and material hardship (Schwartz-Soicher, Geller, and Garfinkel *Forthcoming*) than on their well-being as it relates to family life.

In this study we investigate the mental health effects of incarceration on the mothers of inmates' children using data that are uniquely well-suited to the task, the Fragile Families and Child Wellbeing Study. We estimate the association between paternal incarceration and two related but distinct indicators of maternal mental health, major depression and life dissatisfaction, outcomes that have been linked to additional impairments throughout the life course (Miech and Shanahan 2000; Teitler and Reichman 2008; Yu and Williams 1999) and to child well-being (King and Heard 1999; Turney 2011), thereby making mental health an important conceptual bridge between many literatures. We also pay particular attention to the mechanisms underlying the association between paternal incarceration and maternal mental health. The Fragile Families

data allow us to explore the effects of paternal incarceration using a large, diverse sample; a longitudinal design; an established measure of major depression; a variety of characteristics about both parents; and unusually rich information about their relationship. Furthermore, these data facilitate better estimates than available in prior research by allowing comparison between women attached to men who were recently incarcerated with women attached to men with a history of incarceration but no recent incarceration. Together these design features provide a considerable improvement over previous studies, allowing us to evaluate the consequences of paternal incarceration with greater sensitivity to both social selection processes and mechanisms.

THE COLLATERAL CONSEQUENCES OF MASS IMPRISONMENT

After a long period of mild fluctuation, the imprisonment rate began a steep, steady climb in 1973, reaching an unprecedented rate of more than 500 per 100,000 in 2007 (Uggen, Manza, and Thompson 2006; Wakefield and Uggen 2010) and producing a yearly outflow of nearly 700,000 inmates (West and Sabol 2009). It is by now well known that the burden of mass imprisonment has been disproportionately borne by minority men with little education for whom imprisonment has become a modal event in the life course (Pettit and Western 2004), suggesting that the penal system may have important effects on racial and socioeconomic inequalities more broadly.

As the incarceration rate has risen, so too has the number of incarcerated parents. Between 1991 and 2007, the number of parents held in prison increased nearly 80% to 357,300, affecting an estimated 1,706,600 children (Glaze and Maruschak 2008). Prisoners with young children are, in fact, the norm: Given the young age of most inmates, many have a child under the age of 8 (Glaze and Maruschak 2008; Mumola 2000). Furthermore, the rates of paternal incarceration among African-American children far exceed those of white children: One in four

African-American children born in 1990 could expect to have a parent imprisoned during their childhood, and only one in twenty-five white children could expect to experience this event (Wildeman 2009). These risks, furthermore, are especially elevated for African-American children residing in large U.S. cities; 26% of such children had a father incarcerated by their third birthday (Geller et al. 2009:1190). Because the mean length of a prison sentence is several years, many inmates are absent during key developmental periods of their children's lives.

For incarceration to have consequences for racial inequalities, however, it would need to be not only common and unequally distributed, but also harmful for the adult men who cycle through the system. And for effects on social inequality to linger, the effects of incarceration would have to be transferred across generations. Differentiating the effects of incarceration from pre-existing disadvantages is difficult, of course (Wakefield and Uggen 2010:400-401), but a burgeoning literature suggests substantial negative effects on the economic prospects, health, and family life of ever-incarcerated men (Wakefield and Uggen 2010:393-399). Based on this literature, even if only some of these associations represent causal relationships, the effects of mass imprisonment on former inmates are likely to be overwhelmingly negative and substantial.

Of course, incarceration could damage the life chances of adult men but still *improve* the life chances of their children. Indeed, some researchers presume positive effects on children and, therefore, assume a spurious relationship in the presence of substantial negative associations (for reasons for skepticism, see Giordano 2010:147-150). Even so, the preponderance of evidence suggests negative effects on children and, in the case of positive relationships, conditional relationships (Comfort 2007; Geller et al. 2009, *Forthcoming*; Hagan and Dinovitzer 1999; Murray and Farrington 2008; Wakefield and Uggen 2010; Wakefield and Wildeman *Forthcoming*; Wildeman 2010; Wildeman and Western 2010). For example, recent quantitative

research suggests children whose fathers are abusive or incarcerated for a violent offense suffer far less from paternal incarceration than do other children (Wildeman 2010), a finding consistent with some speculation (Murray and Farrington 2008) and ethnographic research (Comfort 2008).

Virtually all of this research, however, leaves out the partners of the incarcerated. This is surprising given that arrest, incarceration, and release are all likely to be stressful events for these women (Comfort 2007; Hairston 2005; Haney 2003; Morris 1965) and that these women form a bridge between incarcerated men and their children, potentially blunting or accentuating any negative effects. Understanding associations of this sort necessitates considering, in equal measure, the characteristics of both parents, as well as characteristics of the parent's relationship before and after the sentence. As difficult as it is to evaluate the effects of incarceration on men, it is perhaps even more difficult to evaluate the effects of paternal incarceration on mothers, as such spillover effects involve multiple agents, complex pathways, and countervailing influences.

PATERNAL INCARCERATION AND MATERNAL MENTAL HEALTH

Understanding the Effects of Paternal Incarceration on Mothers

For several reasons, the incarceration of fathers likely has a negative effect on the mental health of mothers. Much of the literature highlights the uncertainty and isolation associated with even short spells of incarceration. Daniel and Barrett (1981), for example, find that distress and loneliness among wives of inmates is particularly high, and Fishman (1990) describes the time while husbands are behind bars as one of crisis and anxiety. Implicit in these studies is a vision of incarcerated fathers as committed to both their children and their children's mothers, which may be a reflection of these studies' underlying samples. Because much prior research begins with intact or even thriving partnerships, sustained by regular visits, these findings may not

generalize to the situation of all former inmates (Comfort 2008). However research using more representative samples also finds broad evidence of commitment among incarcerated fathers, at least in principle. In a large-scale interview-based study, Edin, Nelson, and Paranal (2004:50) find that most incarcerated fathers were saddened by the loss of their relationship with their children's mother and expressed regret for missing key milestones in their children's lives. The behavior of incarcerated fathers is often consistent with these sentiments. Most fathers try to maintain contact with their children while in prison (Glaze and Maruschak 2008; Kazura 2000) and, after release, many fathers are involved in co-parenting (Carlson et al. 2008). Given this dedication to their children, incarceration is presumably in many cases a loss for those they leave behind (Braman 2004a), but other mechanisms have the potential to make matters even worse.

In an ethnography of wanted men, Goffman (2009) describes how wanted status leads, in some instances, to partners using the threat of calling the police as a form of social control. For men involved with the criminal justice system, then, partners may be more threatening than they are for those not involved with it, thereby undermining trust (see also Nurse 2002:111). Even when not leveraging their partner's status to achieve certain ends, women often feel complicit in their partner's behavior and, indeed, may be pressured by police to report on their partners' whereabouts, prompting many former inmates to cultivate unpredictability among friends and family (Goffman 2009:351). Under these conditions, even ordinary signs of commitment to family life such as witnessing the birth of a child assume a threatening edge (Goffman 2009).

For their part, mothers often struggle with managing their households in the fathers' absence. Incarceration does more than simply reduce the real and potential support available to mothers. There is considerable research, for example, suggesting that having an incarcerated father adversely affects the behavior of children, which might redouble back to mothers. The

children of incarcerated parents experience the trauma of having a parent arrested, the stress of losing a caretaker, and the stigma of having an incarcerated parent (Comfort 2007; Parke and Clarke-Steward 2002). For all these reasons, they suffer from a range of problems, including but not limited to hyperactivity, aggression, and delinquency (Foster and Hagan 2007, 2009; Gabel 1992; Geller et al. 2009, *Forthcoming*; Murray and Farrington 2005, 2008; Wakefield and Uggen 2010; Wakefield and Wildeman *Forthcoming*; Wildeman 2010). These changes increase the difficulties of parenting, especially when there are fewer adults to share supervision. Moreover these difficulties are unlikely to be resolved when the father is released, as their relationships with their children may be permanently harmed, preventing even the most motivated fathers from helping out (Swisher and Waller 2008). To cope with the stigma of being involved with an incarcerated man, mothers may also try to form new relationships (Edin 2000; Nurse 2002) and/or shield their child from knowledge of the father's situation (Hairston 2005), but these strategies rarely resolve their difficulties and sometimes make them worse (Nurse 2002:114).

Adding to these problems is the diminished socioeconomic resources available to mothers, both while the father is incarcerated and after release. Indeed, as a matter of emphasis some studies target the socioeconomic consequences of incarceration as the root from which many other difficulties grow (Morris 1965; Noble 1995; Richards et al. 1994). Nearly 70% of those in federal prison report they contributed financially to their children prior to incarceration and slightly more than half of fathers in state prison said they provided primary financial support to their minor children prior to arrest (Glaze and Maruschak 2008). Indeed, for many inmates, criminal activities are not inconsistent with these commitments, as they are often a supplement to traditional employment (Edin 2000). When fathers are incarcerated legitimate and illegitimate earnings cease entirely or are diminished substantially. At the same time, incarceration itself

increases some expenses. While fathers are incarcerated, for example, mothers face the expense of providing personal items for the inmate and of maintaining contact (Hairston 2005), which is considerable given the distance to many prison facilities and the unusually high phone service fees of many prisons (Braman 2004b; Comfort 2008). One study estimates the mean total cost of monthly visitation to be just under $300 and finds that the poorest women spend 26% of their income on maintaining contact (Grinstead et al. 2001). The economic costs of imprisonment extend further still. Recent work suggests that the legal debt formerly incarcerated individuals accrue dramatically increases their monthly expenditures (Harris, Evans, and Beckett 2010).

Thus existing research suggests that father's incarceration may harm the mental health of their partners. Although little research differentiates between the effects of first incarcerations and higher order incarcerations, there are indications that the "churning" of men through the penal system is more detrimental to family well-being than an isolated stint (Braman 2004a:59; Wildeman 2010:301). Since men who experience incarceration once have elevated risks of future incarceration, moreover, it would be useful to know whether higher order incarcerations have a more negative effect on the mental health of their romantic partners than isolated stints do.

Evidence for Social Selection

It is easy to envision the difficulties of sharing a child with an incarcerated man, but all of the effects of incarceration could simply reflect selection forces. Many mothers who share children with or are in relationships with incarcerated men may suffer from high levels of stress whether or not the father was incarcerated. Incarceration remains concentrated among poorly educated persons living in disadvantaged communities where depression is more common (Kessler et al. 1995; Mair, Diez Roux, and Galea 2008; Ross 2000). Furthermore, the damaging characteristics

associated with current and former prisoners, including erratic behavior and patterns of abuse, may have been present before their first sentence (Gottfredson and Hirschi 1990). A more direct form of selection is possible. Depression has been linked to a variety of negative outcomes, suggesting that depression itself may be associated with the behavior of mothers involved with incarcerated men. In particular, affective disorders, such as major depression, more than double the odds of premarital parenthood, reduce the likelihood of marriage among single mothers (Teitler and Reichman 2008), and increase the likelihood of divorce (Kessler, Walters, and Forthofer 1998), perhaps because of low self-esteem and attachment to partners with poor employment prospects and self-control (Kessler et al. 1997; Mollborn and Morningstar 2009).

Despite all of the reasons to expect that incarceration is distressing for mothers, the incarceration of some fathers could yield benefits. The incarceration rate has risen over time, but so too has detachment from family life among inmates (Western, Pattillo, and Weiman 2004:8-10). Furthermore even dedicated fathers need not be good partners: Inmates are often abusive in their relationships, even when not convicted of violent offenses (Johnson and Waldfogel 2004; Western and Wildeman 2009). For all these reasons, some families report relief when a troublesome partner is incarcerated (Comfort 2008), but there is more to this possibility than incapacitation. For some mothers, this event serves as a transitional moment, prompting greater independence and a more discerning approach to new partners (Nurse 2002). Considering the full set of potential influences, the effects of the incarceration of a partner are uncertain.

Requirements of an Adequate Research Design

Although excellent ethnographic accounts document the effects of partner incarceration on women's mental health (Braman 2004a; Comfort 2008), there are, to our knowledge, no

quantitative studies of this relationship. This may reflect the steep requirements of an adequate survey research design, which necessitates the following: longitudinal data; information on both parents and potential mechanisms, including the characteristics of their relationship and parenting-related stress; a sufficiently large sample to avoid unusual sample composition issues; and a group of individuals who are truly at risk of incarceration but not recently incarcerated.

Addressing the well-being of mothers also requires sensitivity to the measurement of distress. Because the psychological consequences of incarceration are not well established, it is particularly important to consider multiple manifestations of distress and, to this end, we use both a categorical and dimensional measure. For the former, we explore major depression, using a survey instrument premised on the diagnostic criteria established by the American Psychiatric Association's Diagnostic and Statistical Manual (see our detailed discussion below). For the latter, we explore life dissatisfaction, asked in a global fashion and measured on a four-point scale. These two measures are correlated, but differ in crucial respects and shed light on different aspects of well-being. Whereas major depression is more affective, revealing a severe emotional reaction with syndrome-like features, life dissatisfaction is more cognitive, revealing a reflexive judgment and life summary, albeit one influenced by current emotions (Headey, Kelley, and Wearing 1993; Schwarz and Strack 1999). Because life dissatisfaction is continuous, it may be more sensitive to social influences and, indeed, some sociologists focus on continuous measures of well-being for this reason (Mirowsky and Ross 2002). Yet the literature reviewed above suggests that incarceration may have strong psychological consequences for mothers, leading not only to an increase in distress but also to an increase in the risk for major depression. By using both categorical and dimensional measures, we are able to assess this possibility directly, as well as assess whether the effects of paternal incarceration are consistent across the range of distress,

which is directly relevant to some of our concerns (see Kessler 2002). Major depression may, for example, be more sensitive to social selection than life dissatisfaction, especially if the former has more severe behavioral consequences than the latter, further increasing the value of a design that is comprehensive with respect to both its independent and dependent variables.

DATA, MEASURES, AND ANALYTIC STRATEGY

Data

Data from the Fragile Families and Child Wellbeing Study, a longitudinal cohort examination of about 5,000 children born in urban areas between 1998 and 2000, provide all elements necessary to examine the link between paternal incarceration and maternal mental health (Reichman et al. 2001). The sampling frame included hospitals in 20 U.S. cities with populations greater than 200,000, which were stratified by labor market conditions, welfare generosity, and child support policies. Unmarried mothers were oversampled. Initial interviews were conducted with mothers in hospitals shortly after they gave birth and with fathers either in hospitals after the birth or elsewhere as soon after the birth as possible. Parents were then interviewed by telephone about one, three, and five years after the birth.[3] Of the mothers who participated at baseline, about 90%, 88%, and 87% completed the survey at the one-, three-, and five-year waves respectively (Bendheim-Thoman Center for Research on Child Well-being 2008).

In constructing our analytic sample, we drop observations in which the mother did not complete both the three- and five-year survey (n = 1051). We also drop observations missing values for either dependent variable at the five-year survey (n = 121). Few observations were missing data on the independent variables, and we use multiple imputation to preserve as many

[3] What we call three-year interviews started 2.5 years after the birth, but most took place closer to three years after.

observations as possible in the analytic sample. We impute data with the ICE procedure in Stata 11.0, producing 20 datasets (Royston 2007). Rubin (1987) suggested that ten datasets are sufficient to produce valid and stable inferences, but others now suggest that more datasets are preferable (Graham, Olchowski, and Gilreath 2007). In the imputation model, we include variables related to the research questions or to the likelihood of being missing (Allison 2002). Our final analytic sample represents 77% of the original sample (N = 3,826). Although the multiply-imputed models preserve observations and may reduce bias, models based on listwise deletion revealed virtually identical findings (available upon request from the authors).

The data have a number of notable features. First, and most importantly, they include a large number of women who have a child with an ever-incarcerated man. This is vital because it allows us to construct a better reference group—women attached to ever-incarcerated but not recently incarcerated men—than possible in other data sources, thereby strengthening causal inference (LaLonde 1986; Leamer 1983; Li, Propert, and Rosenbaum 2001). Second, because unmarried parents were oversampled, many women in the sample are young, not educated beyond high school, from disadvantaged racial and ethnic groups, and residing in areas of concentrated poverty. Third, the women in the sample are all mothers with young children. Thus, although the effects of having a partner incarcerated are important in their own right, any effects on the mothers' mental health also have implications for their children (Turney 2011). Fourth, given high rates of depression, life dissatisfaction, and paternal incarceration among mothers in the sample, Fragile Families is the only broadly representative dataset with enough variation to generate reliable estimates of the relationship of interest. Finally, the data include a wealth of information about both parents, making it possible to adjust for pre-existing differences between mothers who have and have not experienced the incarceration of their child's father. This is the

key difference between Fragile Families and the National Longitudinal Survey of Youth 1979 (NLSY79), which is the other dataset regularly used to consider the effects of incarceration (e.g., Lopoo and Western 2005; Massoglia 2008; Schnittker and John 2007; Western 2002).

Measures

Maternal Mental Health. We examine two indicators of maternal mental health, depression and life dissatisfaction, both measured at the three- and five-year surveys. DSM-IV diagnoses of major depressive episodes come from mothers' responses to the Composite International Diagnostic Interview Short Form (CIDI-SF) Version 1.0 November 1998 (Kessler et al. 1998; see also Kessler and Ustun 2004). Mothers were asked if, at some time during the past year, they had feelings of depression or were unable to enjoy things that were normally pleasurable. Those who experienced at least one of these conditions most of the day, every day, for a two-week period were asked additional questions (about losing interest in things, feeling tired, experiencing a change in weight of at least 10 pounds, having trouble sleeping, having trouble concentrating, feeling worthless, or thinking about death), and those who answered affirmatively to three or more of these questions are considered to have Major Depressive Disorder (MDD). These are not lifetime measures of MDD, but instead refer to current or 12-month MDD (1 = *presence of MDD*, 0 = *absence of MDD*).[4] Although there are some limitations stemming from the abbreviated form of the CIDI-SF relative to the full version (Link 2002), it is used often in community surveys to estimate the prevalence of depression, especially when the administration of the full CIDI is not feasible (Aalto-Setala et al. 2002). About 21% of mothers reported symptoms sufficient for a diagnosis of major depression at the three-year interview; 17%

[4] Because the CIDI-SF is premised on lay interviews, respondents who reach the criteria for MDD in our study need not have been diagnosed with the condition by a mental health professional, another noteworthy benefit of using it.

reported depression at the five-year interview. Mothers were also asked to report how satisfied they were with their life, given the options from (1) very satisfied to (4) very dissatisfied. The mean values of life dissatisfaction at the three- and five-year interviews were 1.708 and 1.685.

Recent Paternal Incarceration. Our explanatory variable is recent paternal incarceration, which we define as the father having been incarcerated between the three- and five-year interviews or being incarcerated at the five-year interview. Fathers incarcerated at the three-year interview are considered not recently incarcerated even if they reported subsequent incarceration, which allows us to be certain that we only identify new incarcerations.[5] Although this coding allows us to only identify the short-term effects of incarceration, we consider providing a stronger empirical test of the effects of recent incarceration preferable to providing insight into both the short- and long-term effects of incarceration under a weaker empirical design. We also control for prior incarceration, measured as having ever been incarcerated at any point up to and including the three-year interview. For both measures, we rely on both the mother's and father's reports of incarceration, and assume the father was incarcerated if at least one report is affirmative, as relying solely on either paternal or maternal reports of incarceration leads to overly conservative estimates of incarceration (e.g., Geller et al. 2011).[6] In this sample, nearly 20% of mothers were connected to a man who experienced recent incarceration, and a staggering 39% were attached to a man who had ever been incarcerated by the three-year interview.

Controls. The analyses control for a host of characteristics likely associated with both paternal incarceration and maternal mental health. Crucially, all controls were measured at or

[5] Results were robust to considering (1) fathers incarcerated at the three-year interview who reported incarceration between the three- and five-year interviews as recently incarcerated and (2) fathers currently incarcerated at the five-year interview not recently incarcerated, the latter of which guarantees appropriate time-ordering of the variables.
[6] Although this definition does not require agreement, we believe it provides the most accurate representation of paternal incarceration history. Even so, the correlation between the reports was high: 89% of parents agreed about prior incarceration; 82% agreed about recent incarceration. We ran robustness checks in which we coded paternal incarceration history several different ways, which yielded only small differences from results presented here.

before the three-year interview, preserving appropriate time-ordering between the dependent, explanatory, and control variables. Many of these characteristics were measured for both mothers and fathers. Race is represented by a series of dummy variables: white, African American, Hispanic, and other race. Immigrant status is a dummy variable indicating whether the respondent was born outside of the United States. Age is measured in years. Educational attainment is measured with a series of dummy variables: less than high school diploma, high school diploma or GED, and post-secondary education. We control for the parents' relationship status at the three-year interview: married, cohabiting, in a non-residential romantic relationship, and no longer romantically involved. We also note whether a social father is present at the three-year interview since many mothers in the sample repartnered by then (9.8%). Additionally, to account for the potential direct intergenerational transmission of mental health (Cummings and Davies 1994; Silberg and Rutter 2002), we include a dummy variable indicating whether at least one of the mother's biological parents experienced a two-week period of feeling depressed, down in the dumps, or blue, a sensitive if not specific indicator of a history of major depression.

We also control extensively for economic well-being and family functioning at the three-year interview by adjusting for maternal reports of income-to-poverty ratio, material hardship, relationship quality with the child's father, parenting stress, co-parenting, paternal engagement, and parenting stress. The income-to-poverty ratio is the ratio of the total household income to the official poverty thresholds established by the U.S. Census Bureau. Poverty thresholds correspond to the year before the interview, and are based on reports of household size and composition. Mothers were also asked if, at some point in the past year, they experienced up to 12 proffered events because there was not enough money (e.g., received free food or meals, did not pay the full amount of rent or mortgage payment, or borrowed money from friends or family to help pay

the bills). Answers to these questions were summed to create a scale of material hardship that ranges from 0 to 12. Relationship quality is based on maternal reports of her relationship with the father (1 = *excellent* to 5 = *poor*). Two indicators of co-parenting, shared responsibility in parenting and cooperation in parenting, are consistent with prior research (Carlson et al. 2008). First, mothers were asked how often the father assisted with the following (1 = *never* to 4 = *often*): looking after child when you need to do things; running errands for you like picking up things from the store; fixing things around your home, painting, or helping make it look nicer in other ways; and taking your child places he or she needs to go, such as to daycare or the doctor ($\alpha = 0.934$). This final measure of shared responsibility is the average of mothers' responses, with higher values indicating greater levels of shared responsibility. Second, mothers were asked to respond to six statements about the father (1 = *never* to 4 = *always*): when he is with your child, he acts like the father you want for your child; you can trust him to take good care of your child; he respects the schedules and rules you make for your child; he supports you in the way you want to raise your child; you and him talk about problems that come up with raising your child; and you can count on him to help when you need someone to look after your child for a few hours ($\alpha = 0.956$). Cooperation in parenting is the average of mothers' responses to the six questions, with higher values indicating greater cooperation. Mothers were also asked how many days per week the father did activities with the focal child such as sing songs, read stories, or hug or show physical affection ($\alpha = 0.681$). The final paternal engagement measure is the average of these responses and ranges from 0 to 7, where higher values indicate more engagement. Fathers who did not see the child more than once during the past month are coded 0. Parenting stress comprises responses to the following (1 = *strongly disagree* to 4 = *strongly agree*): being a parent is harder than I thought it would be; I feel trapped by my responsibilities as a parent;

taking care of my children is much more work than pleasure; and I often feel tired, worn out, or exhausted from raising a family ($\alpha = 0.699$). The measure of parenting stress is the average of responses to these questions, with higher values indicating more parenting stress.

Finally, we control for three paternal characteristics that have been repeatedly linked to incarceration and family life: impulsivity, domestic violence, and drug or alcohol abuse (e.g., Gottfredson and Hirschi 1990). By adjusting for these variables, we diminish the concern that a father's antisocial behavior drives both his incarceration and his partner's mental health. Impulsivity is measured by an abbreviated form of Dickman's (1990) impulsivity scale. We average fathers' responses to six questions (1 = *strongly disagree* to 4 = *strongly agree*): often, I don't spend enough time thinking over a situation before I act; I often say and do things without considering the consequences; I often get into trouble because I don't think before I act; many times, the plans I make don't work out because I haven't gone over them carefully enough in advance; and I often make up my mind without taking the time to consider the situation from all angles ($\alpha = 0.976$). Higher values indicate greater impulsivity. We consider fathers to have engaged in domestic violence if the mother reported that he hit, slapped, or kicked her at any point up to and including the three-year interview. Fathers have a drug or alcohol problem if, at any point up to and including the three-year interview, he or the mother reported that drugs or alcohol interfered with the father's work or that drugs or alcohol made it difficult for him to get a job or get along with friends or family.[7] About 8% of mothers reported that the father engaged in domestic violence; 18% of mothers or fathers indicated the father abused drugs or alcohol.

Although these variables are extensive and control for the most important features of social selection, we also control for prior depression and life dissatisfaction in order to control

[7] Unfortunately, the five-year interview does not contain clinical indicators of drug or alcohol dependence.

for more direct forms of selection. We do so by including three-year interview values in models predicting five-year interview values. We adjust for prior depression and life dissatisfaction only in a final specification, allowing the reader to discern the influence of other control variables before controlling for a variable that presumably has the strongest correlation with the outcome.

Mechanisms. We examine three sets of mechanisms that may explain the association between paternal incarceration and maternal mental health: economic well-being, relationship type and quality, and parenting quality and stress. Economic well-being is represented by the change in the mother's income-to-poverty ratio and material hardship between the three- and five-year interviews. Relationship type and quality comprise the second set of mechanisms. Relationship type is measured at the five-year interview, and includes the same dummy variables used as controls.[8] We also include a dummy variable indicating a social father moved into the mother's household between the three- and five-year interviews, as well as a measure of change in relationship quality between the three- and five-year interviews. The third set of mechanisms includes maternal reports of changes in shared responsibility ($\alpha = 0.934$), cooperation in parenting ($\alpha = 0.958$), father engagement ($\alpha = 0.941$), and parenting stress ($\alpha = 0.699$).[9]

Sample Description

In Table 1, we present descriptive statistics of all variables, first for the full sample and then by paternal incarceration history. Most importantly, descriptive statistics show that mothers who

[8] We did not consider change in relationship type because doing so yielded more categories (i.e., cohabiting to married, cohabiting to separated) and did not significantly alter the recent paternal incarceration coefficients.

[9] Changes in children's behavioral problems could also mediate the association between paternal incarceration and maternal mental health, as paternal incarceration is associated with increases in children's behavioral problems (see the review of Wildeman and Western 2011). Unfortunately, we could not examine these mediators without losing at least 1,377 observations because only 2,449 families completed both in-home surveys that asked about children's behavioral problems at the three- and five-year waves. Nonetheless, in a series of robustness checks, we considered this relationship in the limited sample. Results from these analyses (available upon request) suggest that changes in children's behavioral problems do little to mediate the relationship, even before including any other mediators.

had a child with a recently incarcerated man were about 60% more likely to report depression at the five-year survey than were all other mothers, and they also reported more life dissatisfaction. However, having a child with a recently incarcerated man may not necessarily have caused their distress, as these mothers were also severely disadvantaged relative to other mothers in a host of domains, including both prior mental health and paternal antisocial behaviors.

[Insert Table 1 about here.]

Analytic Strategy

Throughout the analysis, we rely on relatively straightforward models—logistic regression models for estimates of depression and ordinary least squared (OLS) models for estimates of life dissatisfaction.[10] Because observations were drawn from 20 cities, we use robust standard errors and include city fixed effects. Our analysis proceeds in two stages, each of which involves several models. In the first stage, we describe the relationship between paternal incarceration and maternal mental health. We then consider the robustness of these relationships by introducing covariates associated with the dependent and explanatory variables. The most rigorous model in this stage also adjusts for depression and life dissatisfaction at an earlier survey wave.

Unfortunately, there is no way to ensure all mothers treated as "controls" were actually at risk of paternal incarceration, which may potentially lead to bias (LaLonde 1986; Leamer 1983; Li et al. 2001). In order to more effectively deal with this threat to causal inference, we split the sample into women attached to men who had ever and never been incarcerated by the three-year

[10] Given the perils of comparing logistic regression coefficients across nested models (e.g., Winship and Mare 1984), we also used a linear probability model to consider effects on depression. The pattern of results and changes in the coefficients across models were nearly identical in the two different types of models. In the linear probability model, the proportion of the relationship explained in Tables 2 and 4 was .51 and .71, slightly different from the .43 and .79 found using logistic regression models. Nonetheless, the linear probability results highlighted the robustness of our findings. Because the life dissatisfaction scale is ordinal, we also estimated life dissatisfaction with ordered logistic regression models. Results were comparable using this alternative method, again suggesting robustness.

interview, and then estimated maternal mental health for these subsamples.[11] Examining the sample of mothers attached to ever-incarcerated fathers provides a superior test of the effects of recent paternal incarceration by diminishing unobserved heterogeneity and increasing confidence that the "control" group was actually at risk of experiencing paternal incarceration, a prerequisite for providing a plausible causal test (LaLonde 1986; Leamer 1983; Li et al. 2001).[12] Furthermore, comparing results across the subsamples provides insight into whether having a child's father churn through the system (ever-incarcerated sample) has different effects on mother's mental health than does his first incarceration (never-incarcerated sample).

In the second stage of our analysis, we consider mechanisms that might attenuate the relationship between paternal incarceration and maternal mental health. Although our models in both of these stages do not yield perfect estimates of causal effects, they nonetheless provide a strong empirical test of the collateral consequences of mass incarceration for mothers.

RESULTS

The Relationship Between Paternal Incarceration and Maternal Mental Health

We first present logistic regression models that estimate maternal mental health as a function of recent paternal incarceration. Turning first to Table 2, Model 1 considers the association between recent paternal incarceration and maternal depression controlling only for prior paternal incarceration. It indicates that recent paternal incarceration is significantly associated with a

[11] We also could have compared the coefficients of recent and prior paternal incarceration in the full model presented in Model 4 of Tables 2 and 3. Because these models could potentially have produced biased estimates of both recent and prior paternal incarceration, we opted for the more rigorous test in which we split the sample.
[12] In the appendix, we show results from propensity score models with Mantel-Haenszel bounds generated using STATA-compatible software designed by Becker and Caliendo (2007) and Leuven and Sianesi (2003). Results from these models suggest that paternal incarceration is associated with substantial, statistically significant increases in maternal depression and life dissatisfaction (Table A1) and that any unobserved selection forces would have to be quite substantial to render the relationships statistically insignificant (Table A2), again suggesting robustness.

greater likelihood of depression. For mothers who had a child with a recently incarcerated man, the odds of being depressed are more than 50% ($e^{.434}$) higher than for women who had a child with a man not recently incarcerated ($p < .001$). A history of paternal incarceration by the three-year interview is also significantly associated with an elevated risk of maternal depression, but the magnitude of the relationship is about 40% smaller (Odd Ratios of 1.54 and 1.31).

Although findings from Model 1 suggest that recent paternal incarceration is associated with a substantial and statistically significant increase in the risk of depression, this model does not control for factors associated with both recent paternal incarceration and maternal depression other than prior paternal incarceration. The remaining models do so in a progressive fashion. In Model 2, we adjust for a host of maternal characteristics. Taking into account these characteristics, the relationship between recent paternal incarceration and maternal depression continues to be statistically significant ($p < .01$), and the magnitude of the coefficient diminishes by 23%, suggesting the observed maternal characteristics explain some, but certainly not all, of the association between recent paternal incarceration and mother's increased risk of depression. Interestingly, adjusting for maternal characteristics renders the relationship between prior paternal incarceration and maternal depression statistically insignificant, and diminishes the size of the coefficient by nearly two-thirds.

In Model 3, we consider the possibility that paternal characteristics may also diminish the association between recent paternal incarceration and maternal depression. Adjusting for paternal characteristics—most relevantly, antisocial behaviors—diminishes the statistical significance of the recent paternal incarceration-maternal depression relationship ($p < .05$). Nonetheless, compared to Model 2, it only diminishes the magnitude of the relationship by 15%. After

adjusting for paternal characteristics, the relationship between prior paternal incarceration and maternal mental health declines again substantially—down 43% from Model 2 to .055.

In Model 4 of Table 2, we provide a more rigorous test of this relationship by also adjusting for maternal depression at the three-year interview. After doing so, the association between recent paternal incarceration and maternal mental health is no longer statistically significant at the conventional level ($p = .053$), which provides some but not overwhelming evidence that the relationship may not be as robust as suggested by the earlier models. More interestingly, the association between recent paternal incarceration and maternal depression diminishes 43% from Model 1 to Model 4, suggesting conditions associated with both paternal incarceration and poor maternal mental health explain more than two-fifths of the relationship.

To this point, we have proceeded as though mothers attached to men who have never been incarcerated are an appropriate reference group, but many of these women were at minimal risk of experiencing recent paternal incarceration, resulting in potentially biased estimates. To diminish this concern, we chose a different reference group: women attached to men ever incarcerated by the three-year interview but without incarceration between the three- and five-year interviews. Since their history of incarceration suggests these men may be at risk of experiencing incarceration again, they provide a more appropriate reference group than do never-incarcerated men. Results from Model 5, which limits the sample to men ever incarcerated by the three-year interview, provide strong support for the hypothesis that recent paternal incarceration damages maternal mental health, as recent paternal incarceration is associated with a significant ($p < .05$) increase in the risk of maternal depression. Furthermore, the relationship is substantial. Net of observed background characteristics and prior maternal depression, the odds of

experiencing a major depressive episode are nearly 40% higher for mothers attached to recently incarcerated men than for mothers attached to men with prior but not recent incarceration.

By restricting the analytic sample to women attached to men with a high risk of incarceration, we are able to reduce some threats to causal inference. Restricting the sample also allows us to consider the hypothesis that parenting with a man who is churning through the system—as measured by multiple bouts of incarceration—is especially damaging to maternal mental health. In Model 5, all recent bouts of incarceration were indicative of higher order incarcerations, which indicate that churning is indeed damaging to maternal mental health. In Model 6, we consider the association between recent paternal incarceration and maternal mental health in a sample of women who had children with men who had never been incarcerated by the three-year interview. In this model, the effects of incarceration are statistically insignificant and small—less than 15% of the size of the coefficient shown in Model 5. Taken together, results from Models 5 and 6 suggest that having a romantic partner cycle through the system is keenly detrimental to maternal depression and that first incarceration bouts may be less so.

[Insert Table 2 about here.]

We consider life dissatisfaction, a potentially more sensitive measure than depression, in Table 3. Consistent with the comparison model in Table 2, Model 1 shows that women who have a child with a recently incarcerated man report more life dissatisfaction than women attached to men who have never been incarcerated. In Model 1, the coefficients of recent and prior incarceration are indistinguishable. In Models 2 and 3, which respectively adjust for maternal and paternal characteristics, only recent paternal incarceration is associated with more life dissatisfaction ($p < .01$). Even in Model 4 in Table 3, which adjusts for earlier life dissatisfaction, recent paternal incarceration is associated with more life dissatisfaction. Interestingly, adjusting

for other covariates more substantially diminishes the association between recent paternal incarceration and maternal life dissatisfaction than for depression; in the final model for the full sample (Model 4), the association is reduced by about 60% compared to Model 1.

In Models 5 and 6, we provide the same sample restrictions as in Table 2. In Model 5, which restricts the sample to women attached to ever-incarcerated men, recent paternal incarceration is associated with more life dissatisfaction ($p < .05$). Similar to the results for depression, the coefficient for recent incarceration is larger in magnitude in Model 5 than in Model 4, further buttressing the case for a causal link between recent paternal incarceration and maternal mental health. In the sample of women attached to never-incarcerated men, however, the coefficient of recent incarceration was again statistically insignificant and small in magnitude, suggesting that having a child with a man churning through the penal system may be especially damaging for maternal mental health.

[Insert Table 3 about here.]

Mechanisms Underlying the Paternal Incarceration-Maternal Mental Health Relationship

Beyond demonstrating a robust relationship between paternal incarceration and maternal mental health, we are interested in factors that explain this relationship, which we address in Tables 4 and 5. In these tables, we consider several possible mediators, focusing on changes in economic well-being and hardship, relationship status and quality, and parenting quality and stress.[13]

We first turn to estimates of maternal depression in Table 4, focusing our discussion on how the coefficient for recent paternal incarceration in Table 4 differs from this coefficient in

[13] Results from models for the ever-incarcerated sample were similar. In the full model including all mechanisms, the effects of recent paternal incarceration on maternal mental health were reduced to statistical nonsignificance, explaining 40 percent of the association with depression and 60 percent of the association with life dissatisfaction.

Table 2 (Model 4; 0.248). Model 1 suggests that changes in economic well-being between the three- and five-year interviews dramatically diminish the magnitude (by 40%) of the association between recent paternal incarceration and maternal depression. Models 2 and 3 indicate that changes in the relationship- and parenting-related mediators also explain a substantial share of the association (31 and 45%, respectively). The final model (Model 4) considers all mechanisms simultaneously. In this model, the relationship between paternal incarceration and maternal depression is, unsurprisingly, far smaller than in any other model. The magnitude of the association is diminished by about 79% relative to Model 4 in Table 2. Taken together, changes in economic well-being, relationship type and quality, and parenting quality and stress are the primary mechanisms linking paternal incarceration to maternal depression, with economic well-being and parenting characteristics playing a relatively more important role than relationship characteristics, though these also play a nontrivial role in mediating this relationship.

[Insert Table 4 about here.]

In Table 5, we examine the mechanisms underlying the association between paternal incarceration and maternal life dissatisfaction. As our starting point, we again use the coefficient for recent paternal incarceration in Model 4 of Table 3 (.078). Adjusting for changes in economic well-being in Model 1 renders the relationship between recent paternal incarceration and maternal life dissatisfaction only marginally significant, diminishing the association by around 27%. Results from Model 2, which considers whether relationship type and quality mediate the association, tell a similar story. Changes in relationship characteristics explain about 42% of the association and render it statistically insignificant. Parenting characteristics, included in Model 3, mediate 41% of the association and render it statistically insignificant. Thus, parenting stress and quality are powerful mediators of the effects of paternal incarceration on maternal life

dissatisfaction. In contrast to estimates of major depression, relationship and parenting characteristics may be more important mechanisms than economic well-being. In the final model, we consider all the mechanisms simultaneously. The relationship is reduced by 69% and statistically insignificant, again suggesting the importance of these mediators.

[Insert Table 5 about here.]

Racial and Ethnic Variations in These Relationships

Results to this point have yielded insight into the robustness of the relationship between recent paternal incarceration and maternal mental health as well as the mechanisms that mediate the relationship. However, we have not yet examined how the consequences of recent paternal incarceration for maternal mental health may vary by mother's race/ethnicity.

In a series of models examining interactions between incarceration and race/ethnicity (results not presented but available upon request from the authors), three important findings emerged. First, after adjusting for all controls in the final models of Tables 2 and 3, there is no association between paternal incarceration and maternal depression for white or African American women. However, Hispanic women who share children with recently incarcerated men have a greater likelihood of depression than those attached to men not recently incarcerated. Second, the negative effects of paternal incarceration hold for life dissatisfaction among both white and Hispanic mothers. For African American mothers, however, recent paternal incarceration is not associated with a significant increase in life dissatisfaction in the full or ever-incarcerated sample. One interpretation is that African American mothers better cope with the cycling patterns of incarcerated fathers, although more research is needed to test this idea. Finally, the mechanisms do not fully explain the association between paternal incarceration and

maternal depression for Hispanic women, which suggests there must be another pathway through which paternal incarceration affects Hispanic women. One possibility is social support. It may be that incarceration reduces women's support networks, and given that Hispanics are more likely than other groups to receive support from a broad network (Roschelle 1997; Haxton and Harknett 2009), they may experience more distress when their networks no longer exist. Although we found no support for this in the data, there are at least two other possibilities. First, the stigma of being attached to an incarcerated man might be greatest for Hispanic women. Although this is a possibility, there is significant debate surrounding racial and ethnic variations in the stigma attached to incarceration (Braman 2004a; Clear 2007, 2008), so this is unlikely to be the sole mechanism. Second, the high levels of familism among Hispanics relative to other groups may make the incarceration of a partner most harmful for the mental health of Hispanic women since they might rely on their partners for emotional support more or attach greater significance to their relationship with the father of their children (for related examples, see Desmond and López-Turley 2009; Wilcox and Wolfinger 2007). Regardless of the specific mechanism, these findings suggest future research should pay greater attention to the Hispanic community when considering the collateral consequences of mass imprisonment.

DISCUSSION

This study helps to fill a large gap on the collateral consequences of incarceration, bridging the literature on the effects of incarceration on current and former inmates with the smaller literature on the effects of incarceration on children and families by focusing on the situation of mothers, who have been largely—although not entirely—overlooked. These seemingly disparate literatures have more in common than might first appear, as our results suggest that the negative

effects of incarceration on mothers stem in no small part from the well-known socioeconomic effects of incarceration on fathers (e.g., Pager 2003; Western 2002, 2006). Yet the results reveal a number of additional dimensions to the effects of incarceration, suggesting the collateral consequences of incarceration are not simply a matter of financial instability.

In the first stage of our analyses, we reveal a significant negative association between recent paternal incarceration and maternal mental health. Starting with depression, we find that recent paternal incarceration significantly increases the likelihood of major depression. In the fully specified model, the coefficient of recent paternal incarceration (.248) is most comparable to the coefficient of domestic violence history (.286), suggesting that the destabilizing effects of imprisonment on maternal depression are as substantial as domestic violence. Depression in at least one of the mother's parents is also significantly associated with maternal depression and reveals the importance of family background, but it is unclear whether this association reflects the direct inheritance of depression or whether it reflects other risk factors correlated with depression among both parents and their offspring. In either case, this finding encourages an intergenerational approach to the study of depression, union formation, and incarceration.

The relationship between recent paternal incarceration and maternal depression is also related to characteristics of the father, but to a lesser extent. Among the paternal traits included in our models, none apart from incarceration is related to maternal depression. Paternal race, education, and impulsivity, despite their importance to incarceration, are not associated with maternal depression. Because recent incarceration matters most in a sample limited to women attached to ever-incarcerated men, recidivism may be the key to understanding the link between recent paternal incarceration and maternal mental health, but recidivism may be important not for what it reveals about the father's characteristics as what it reveals about the mother's situation.

Research on coping suggests that multiple events may be more difficult to cope with than isolated events, owing in part to the unpredictability multiple events entail (Thoits 1995). Multiple events tend to overwhelm coping resources more than single events, and the same may be true of incarceration. If the imprisonment of the father is an isolated incident, it may be easier to cope with than the uncertainty of repeated prison terms. The current study supports the idea that higher order incarcerations may be especially damaging (Braman 2004a; Wildeman 2010).

The results for life dissatisfaction are similar with respect to magnitude, but they are not with respect to statistical significance, as the effect of recent paternal incarceration maintains significance at the conventional .05 level in the full specification for life dissatisfaction but not for depression. Most importantly perhaps, the effects of recent paternal incarceration on maternal depression and life dissatisfaction are substantial and significant in a sample limited to mothers who had a child with an ever-incarcerated man, a group at high risk of incarceration. Because of this improved reference group, these models provide the strongest evidence of a causal effect.

Our analyses also go a long way to showing key mechanisms behind these associations. All the mechanisms identified in the literature play a role: Economic well-being and parenting characteristics explain much of the association with maternal depression, and relationship characteristics and parenting characteristics explain much of the effects on life dissatisfaction. In the final models, which include all the mediating variables, recent incarceration is statistically insignificant and much smaller (at least 69%) than in models only accounting for selection (in Tables 2 and 3). Altogether these patterns reveal that some of the strongest negative effects of incarceration on the well-being of those left behind stem from the three sources we speculated would be most vital: financial instability, deteriorating relationships, and parenting difficulties.

It is important to emphasize that the cross-sectional relationship between paternal incarceration and maternal mental health is greatly inflated by selection. In Table 2, for example, the basic selection factors presented in Models 2 through 4 explain 43% of the apparent effect of recent paternal incarceration presented in Model 1. This reveals an important feature of this population: Among the Fragile Families mothers, depression is common regardless of whether the father of their children is incarcerated or not, and consistent with this, our results suggest that much of the apparent risk of incarceration reflects factors other than incarceration. This suggests a more holistic view than research in this area has often taken, an idea firmly endorsed by some who have been critical of this broader research program (Giordano 2010:147-150).

Limitations

Although our models help to disentangle the mechanisms linking paternal incarceration to maternal mental health, certain features of our design leave some questions unresolved. For one, there is uncertainty regarding the nature of paternal incarceration. Our coding of incarceration allows us to partially distinguish prison histories, and our results, indeed, reveal meaningful differences between those who cycle through the prison system and those with more isolated sentences. But it remains unclear what these differences reflect, for which there are at least three possibilities. First, they could reflect the characteristics of fathers, including the severity of their offense, which may be related, in turn, to potential mediating mechanisms, including stigma. Related to this, these differences could reflect a proclivity for recidivism and this proclivity may also be related to how these inmates behave as husbands and fathers. Second, these differences could reflect contextual influences related to the local community and its criminal justice system. Fathers with multiple prison sentences may reside in areas with stronger judicial systems, stricter

parole violation policies, closer police supervision, or more criminal opportunities, all of which could affect the well-being of mothers independent of the situation of fathers. Many of these influences are, to be sure, eliminated by controlling for the city the respondent resides in, but within-city heterogeneity may be crucial and imperfectly related to between-city heterogeneity. Third, as mentioned above, these differences may reflect different coping processes, but given how incarceration is measured, stress and coping are difficult to disentangle, as identifying the timing of events is crucial to understanding the stress events entail. Because of this, future research should discern how much of the apparent heterogeneity is due to differences in stress and how much is due to differences in coping, especially as interventions will likely focus on coping. Finally, despite our best efforts to establish appropriate time-ordering of the variables, to adjust for a host of covariates associated with both paternal incarceration and maternal mental health, and to utilize an appropriate reference group, our results might still be driven by selection into incarceration based on unobserved anterior factors. In supplementary analyses (Table A2), we show that in a precisely matched sample, such selection forces would have to be substantial to render the associations we estimate above insignificant, but this is always a concern.

Related to this are two additional dimensions of unobserved heterogeneity. First, Fragile Families does not contain information regarding the circumstances surrounding the father's arrest or imprisonment, both of which may influence mental health. Some evidence suggests, for example, that those who witness an arrest of a family member experience distress and trauma as a result (Comfort 2007). Similarly, separation may be more or less distressing depending on the ease with which the relationship can be maintained during a sentence. Comfort (2008) describes the obstacles women experience when visiting their partners in prison, stemming from the long distance many have to travel, unusually large phone bills, and the strict supervision of visitation

by prison guards. The distress of having an incarcerated partner may be less when the visitation process is easier and less costly. For their part, some incarcerated fathers may suffer less as a result of the policies and practices of the institution they are sentenced to and, as a result, be more effective fathers upon release. Second, the source of parenting stress is unclear, and different sources imply very different processes. Increased parenting stress could imply less adult supervision, more difficulty with work-family balance, or changes in the behavior of children that make parenting more difficult. Although the data utilized allow us to shed some light on mechanisms, future research should further investigate the stressors that drive this relationship.

Finally, it is worth reiterating that our analyses may be subject to threats to causal inference. Our design includes all the relevant influences discussed in the literature, features appropriate time-ordering of variables, and utilizes a reference group at risk of paternal incarceration, increasing our confidence in light of sophisticated studies that have collected many forms of data and speculated broadly. But it is still possible that some unmeasured factors increase distress and the likelihood of incarceration or that some of our covariates are measured with sufficient error to decrease their power as control variables. Although it is appropriate to be cautious about causal inference, we would also like to encourage more empirical research on a topic that does not naturally lend itself to an experimental approach. Given the unprecedented rise in incarceration, the risks of not understanding its consequences are more severe than the risks of occasionally overstating its effects. Moreover, without a complete understanding of whether and how incarceration matters, the risk of over-controlling can be as great as that of under-controlling. For example, some of our control variables, such as education or impulsivity, could be outcomes of incarceration as much as determinants, meaning that thinking of them in terms of selection can lead to overly conservative conclusions. Similarly, an incomplete

understanding of the situation of the mothers of their children could lead to an overly restrictive approach. For example, given that many of the mothers in the sample re-partner with new men (Bzostek, McLanahan, and Carlson 2010), some of whom have experienced incarceration themselves, our results may underestimate the consequences of incarceration by focusing only on the incarceration history of biological fathers. Other aspects of the results lend confidence to our controls. Given the broad and severe behavioral consequences of depression, major depression is likely more sensitive to selection than is life dissatisfaction. Yet controlling for major depression is, in general, no more consequential for the incarceration coefficients than is controlling for prior life dissatisfaction, lending further support for an effect rather than an association.

Conclusion

Our results suggest that paternal incarceration, particularly when fathers cycle through the penal system, harms the mental health of the mothers of their children. In this sense, our study adds to a growing body of research on the collateral consequences of incarceration and, like much of that research, highlights the centrality of incarceration's socioeconomic effects. At a more general level, our study reveals that inmates are embedded in networks comprised of partners and children, among whom incarceration exerts demonstrable effects. Like inmates themselves, the families of inmates may have a difficult time adjusting to incarceration, even if for them the impact of incarceration is more indirect and its effects seemingly more avoidable. Researchers of contemporary American families may therefore do well to incorporate incarceration alongside other forms of family instability, as the influence of incarceration on economically insecure families is pervasive and transmittable in ways social scientists are only beginning to understand.

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APPENDIX A: RESULTS FROM PROPENSITY SCORE MODELS

Although limiting the sample to the romantic partners of ever-incarcerated men is one way to ensure an appropriate "control" group, propensity score models are becoming an especially common—and potentially better—method for doing so (for relevant discussions, see especially Li et al. 2001; Massoglia 2008; Morgan and Winship 2007). To ensure the results presented in the main text are robust to this potentially more rigorous test, we present results from a series of propensity score models.[14] Following suggestions put forth by Morgan and Winship (2007:113), we relied on a model including a dummy indicating whether the father had ever been incarcerated by the three-year interview, centered measures of maternal and paternal age, dummies indicating whether the mother had dropped out of high school and the father had dropped out of high school, a dummy indicating whether the father was African American, a dummy indicating whether the father had ever abused drugs or alcohol by the three-year interview, the family's income-to-poverty ratio at the three-year interview, second- and third-order polynomials on all continuous measures, and all possible two-way interactions using software designed by Leuven and Sianesi (2003). This model fit the data reasonably well, explaining 22% of the variance (results available upon request from the authors).

After ensuring the "treatment" and "control" groups were balanced, we limited the analysis to the region of common support and estimated effects using three propensity score models: a radius model with a caliper of .005; a nearest neighbor model with five nearest neighbors and a caliper of .005; and a kernel model with an Epanechnikov kernel and a bandwidth of .06. Results are shown in Table A1. Results suggested strong, consistent,

[14] Although all models discussed in the text utilized 20 multiply-imputed datasets, results from these robustness checks rely on only 1 multiply-imputed dataset because the MICOMBINE command used for multiply imputed data computes only estimated effects for the groups off support, which is undesirable for a number of reasons. Nonetheless, given the magnitude of the relationships shown and the generally small change in point estimates resulting from using more or less datasets, our results are likely robust to using the full 20 datasets.

damaging, statistically significant effects of recent paternal incarceration on maternal mental health. Thus, results from these propensity score models indicate that the results demonstrated in this paper were robust to alternate modeling strategies such as propensity score models.

[Insert Table A1 about here.]

Nonetheless, because propensity score models cannot diminish concerns that unobserved heterogeneity may be driving the results, we also present results from a series of Mantel-Haenszel bounds. Put simply, Mantel-Haenszel bounds quantify how large unobserved factors driving us to overestimate the "treatment" effect would have had to be to render the relationship between recent paternal incarceration and maternal mental health statistically insignificant. In so doing, they yield insight into how large unobserved selection forces would have to be to undo our findings. These analyses were conducted using STATA-compatible software designed by Becker and Caliendo (2007). These results are shown in Table A2. In general, results suggest that such selection forces would have had to increase the odds of receiving the "treatment" of recent paternal incarceration between 30 percent and 70 percent to render the relationships statistically insignificant. Thus, any unobserved selection force would need to have quite a substantial role in shaping the risk of recent paternal incarceration to undo our results.

[Insert Table A2 about here.]

In a final robustness check, not presented but available upon request from the authors, we ran the same series of propensity score models with Mantel-Haesnzel bounds in a sample limited to mothers connected to ever-incarcerated men at the three-year interview. (The measure of having ever been incarcerated by the three-year interview and all interactions with it were dropped from the model.) These models yielded coefficients similar to the earlier models, which further suggests that the relationship is quite robust to alternate specifications.

Table 1. Means and Standard Deviations of Variables Used in Analyses

	Full sample		Recently incarcerated fathers		Not recently incarcerated fathers		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Key variables							
Mother depression (y3)	0.207		0.303		0.185		***
Mother depression (y5)	0.169		0.240		0.152		***
Mother life dissatisfaction (y3)	1.708	(0.736)	1.929	(0.798)	1.655	(0.710)	***
Mother life dissatisfaction (y5)	1.685	(0.722)	1.912	(0.785)	1.630	(0.695)	***
Father recently incarcerated (y3, y5)	0.195		1.000		0.000		***
Father ever incarcerated by 3-year survey (b, y1, y3)	0.390		0.786		0.294		***
Mother race (b)							
Black	0.489		0.639		0.452		***
Hispanic	0.258		0.190		0.275		***
Other race	0.037		0.025		0.040		^
White	0.215		0.145		0.232		***
Mother foreign-born (b)	0.144		0.047		0.168		***
Mother age (b)	25.212	(6.057)	22.975	(5.329)	25.754	(6.098)	***
Mother education (b)							
Less than high school	0.281		0.366		0.261		***
High school diploma or GED	0.250		0.260		0.248		***
Post-secondary education	0.469		0.374		0.492		***
Mother's parent experienced depression (y3)	0.328		0.370		0.318		**
Mother income-to-poverty ratio (y3)	1.935	(2.495)	1.122	(1.121)	2.131	(2.688)	***
Mother material hardship (y3)	0.889	(1.268)	1.229	(1.427)	0.807	(1.212)	***
Mother relationship status with father (y3)							
Married	0.320		0.107		0.372		***
Cohabiting	0.196		0.162		0.204		**
Non-residential relationship	0.057		0.094		0.048		***
Separated	0.427		0.637		0.376		***
Mother involved with new partner (y3)	0.098		0.141		0.088		***
Mother relationship quality with father (y3)	2.878	(1.444)	3.465	(1.391)	2.736	(1.421)	***
Mother parenting stress (y3)	2.727	(0.691)	2.636	(0.732)	2.749	(0.679)	***
Mother report of shared responsibility in parenting (y3)	2.647	(1.156)	2.146	(1.158)	2.768	(1.133)	***
Mother report of cooperation in parenting (y3)	3.189	(1.021)	2.819	(1.091)	3.278	(0.983)	***
Mother report of father engagement (y3)	4.975	(0.929)	4.892	(0.964)	4.994	(0.919)	**
Father race (b)							
Black	0.508		0.670		0.468		***
Hispanic	0.263		0.200		0.278		***
Other race	0.040		0.029		0.043		^
White	0.190		0.101		0.211		***
Father foreign-born (b)	0.161		0.066		0.184		***
Father age (b)	27.857	(7.219)	25.517	(6.789)	28.424	(7.206)	***
Father education (b)							
Less than high school	0.333		0.469		0.300		***
High school diploma or GED	0.304		0.340		0.295		*

Post-secondary education	0.363		0.190		0.405		***
Father impulsivity (y1)	2.168	(0.994)	2.324	(1.032)	2.131	(0.981)	***
Father engaged in domestic violence (b, y1, y3)	0.082		0.174		0.060		***
Father drug or alcohol abuse (b, y1, y3)	0.177		0.355		0.133		***
Change in mother income-to-poverty ratio (y3, y5)	0.007	(1.891)	0.048	(1.054)	-0.004	(2.043)	
Change in mother material hardship (y3, y5)	0.192	(1.221)	0.246	(1.449)	0.178	(1.159)	
Mother relationship status with father (y5)							
Married	0.318		0.066		0.379		***
Cohabiting	0.129		0.087		0.139		***
Non-residential relationship	0.035		0.046		0.032		^
Separated	0.519		0.802		0.450		***
Mother involved with new partner (y5)	0.156		0.251		0.133		***
Change in mother relationship quality with father (y3, y5)	0.169	(1.264)	0.374	(1.503)	0.119	(1.194)	***
Change in mother parenting stress (y3, y5)	0.055	(0.658)	-0.008	(0.712)	0.071	(0.643)	**
Change in mother report of shared responsibility in parenting (y3, y5)	-0.172	(0.901)	-0.359	(1.118)	-0.127	(0.834)	***
Change in mother report of cooperation in parenting (y3, y5)	-0.121	(0.833)	-0.268	(1.100)	-0.085	(0.750)	***
Change in mother report of father engagement (y3, y5)	-2.821	(2.053)	-3.860	(1.918)	-2.570	(2.005)	***
N	3,826		746		3,080		

Notes: b: measured at baseline survey; y1: measured at 1-year survey; y3: measured at 3-year survey; y5: measured at 5-year survey. Asterisks for significance tests comparing fathers recently incarcerated to fathers not recently incarcerated. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2. Logistic Regression Models Predicting Mother's Depression by Father's Incarceration with Controls

	Full sample												Ever incarcerated			Never incarcerated		
	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Father recently incarcerated	0.434	(0.112)	***	0.335	(0.121)	**	0.307	(0.123)	*	0.248	(0.128)	^	0.321	(0.151)	*	0.046	(0.264)	
Father ever incarcerated	0.268	(0.097)	**	0.095	(0.109)		0.055	(0.113)		0.139	(0.117)		---	---		---	---	
Mother race																		
Black				-0.248	(0.139)	^	-0.367	(0.220)	^	-0.468	(0.228)	*	-0.461	(0.340)		-0.536	(0.330)	
Hispanic				-0.393	(0.173)	*	-0.407	(0.211)	^	-0.429	(0.218)	*	-0.631	(0.330)	^	-0.461	(0.300)	
Other race				-0.310	(0.272)		-0.354	(0.314)		-0.364	(0.326)		-0.478	(0.534)		-0.271	(0.421)	
White (reference)				---	---		---	---		---	---		---	---		---	---	
Mother foreign-born				-0.180	(0.174)		0.020	(0.220)		0.011	(0.223)		0.064	(0.389)		0.010	(0.275)	
Mother age				0.011	(0.009)		0.004	(0.012)		0.005	(0.012)		0.009	(0.019)		-0.009	(0.017)	
Mother education																		
Less than high school				0.072	(0.131)		0.087	(0.133)		0.077	(0.137)		0.202	(0.184)		-0.155	(0.211)	
High school diploma or GED				0.146	(0.121)		0.146	(0.122)		0.144	(0.127)		0.313	(0.191)		0.030	(0.177)	
Post-secondary education (reference)				---	---		---	---		---	---		---	---		---	---	
Mother's parent experienced depression				0.854	(0.095)	***	0.851	(0.095)	***	0.636	(0.101)	***	0.619	(0.154)	***	0.676	(0.140)	***
Mother income-to-poverty ratio				-0.024	(0.048)		-0.028	(0.051)		-0.016	(0.047)		-0.134	(0.067)	*	0.005	(0.035)	
Mother material hardship				0.249	(0.035)	***	0.238	(0.035)	***	0.148	(0.038)	***	0.134	(0.055)	*	0.160	(0.054)	**
Mother relationship status with father																		
Married				0.418	(0.188)	*	0.430	(0.189)	*	0.468	(0.197)	*	0.803	(0.295)	**	0.251	(0.269)	
Cohabiting				0.329	(0.186)	^	0.341	(0.187)	^	0.346	(0.194)	^	0.820	(0.261)	**	-0.013	(0.286)	
Non-residential relationship				0.247	(0.239)		0.269	(0.240)		0.397	(0.244)		0.127	(0.350)		0.679	(0.355)	^
Separated (reference)				---	---		---	---		---	---		---	---		---	---	
Mother involved with new partner				-0.053	(0.164)		-0.077	(0.166)		0.042	(0.170)		-0.079	(0.226)		0.221	(0.278)	
Mother relationship quality with father				0.286	(0.057)	***	0.267	(0.058)	***	0.213	(0.060)	***	0.152	(0.088)	^	0.268	(0.085)	**
Mother parenting stress				-0.339	(0.069)	***	-0.348	(0.069)	***	-0.214	(0.071)	**	-0.261	(0.109)	*	-0.184	(0.098)	^
Mother report of shared responsibility in parenting				0.021	(0.081)		0.027	(0.082)		0.010	(0.087)		-0.045	(0.125)		0.032	(0.126)	
Mother report of cooperation in parenting				0.090	(0.080)		0.085	(0.081)		0.083	(0.084)		-0.081	(0.119)		0.272	(0.122)	*
Mother report of father engagement				0.074	(0.051)		0.079	(0.052)		0.095	(0.055)	^	0.044	(0.082)		0.145	(0.074)	*
Father race																		
Black							0.183	(0.234)		0.295	(0.241)		0.238	(0.372)		0.022	(0.338)	

Hispanic			0.078	(0.219)		0.102	(0.225)		-0.118	(0.355)		0.274	(0.298)	
Other race			-0.033	(0.300)		-0.039	(0.313)		0.213	(0.502)		0.256	(0.420)	
White (reference)			---	---		---	---		---	---		---	---	
Father foreign-born			-0.334	(0.235)		-0.326	(0.230)		-0.092	(0.412)		-0.127	(0.270)	
Father age			0.009	(0.009)		0.008	(0.142)		-0.002	(0.015)		-0.401	(0.013)	^
Father education														
Less than high school			-0.060	(0.138)		-0.010	(0.142)		-0.292	(0.204)		0.289	(0.202)	
High school diploma or GED			-0.066	(0.127)		-0.023	(0.132)		-0.037	(0.195)		0.008	(0.184)	
Post-secondary education (reference)			---	---		---	---		---	---		---	---	
Father impulsivity			-0.025	(0.059)		-0.027	(0.062)		0.017	(0.089)		-0.065	(0.085)	
Father engaged in domestic violence			0.336	(0.161)	*	0.286	(0.171)	^	0.080	(0.212)		0.882	(0.302)	**
Father drug or alcohol abuse			0.090	(0.127)		-0.040	(0.134)		-0.216	(0.174)		0.210	(0.215)	
Mother depression (lagged)						1.488	(0.105)	***	1.598	(0.157)	***	1.474	(0.151)	***
Constant	-1.677	-3.033	-2.966			-3.585			-2.046			-4.667		
R-squared	0.021	0.101	0.104			1.630			0.179			0.168		
N	3,826	3,826	3,826			3,826			1,492			2,334		

Notes: All models include city fixed-effects. Standard errors are in parentheses. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3. OLS Regression Models Predicting Mother's Life Dissatisfaction by Father's Incarceration with Controls

	Full sample												Ever incarcerated			Never incarcerated		
	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Father recently incarcerated	0.193	(0.034)	***	0.104	(0.033)	**	0.096	(0.033)	**	0.078	(0.031)	*	0.101	(0.040)	*	0.052	(0.051)	
Father ever incarcerated	0.185	(0.026)	***	0.043	(0.027)		0.037	(0.027)		0.030	(0.026)		---	---		---	---	
Mother race																		
Black				0.038	(0.032)		-0.019	(0.055)		-0.031	(0.053)		-0.083	(0.095)		-0.005	(0.063)	
Hispanic				-0.083	(0.039)	*	-0.138	(0.049)	**	-0.105	(0.045)	*	-0.117	(0.083)		-0.115	(0.055)	*
Other race				0.076	(0.062)		0.022	(0.072)		0.011	(0.068)		-0.196	(0.137)		0.098	(0.077)	
White (reference)				---	---		---	---		---	---		---	---		---	---	
Mother foreign-born				-0.155	(0.036)	***	-0.131	(0.046)	**	-0.120	(0.044)	**	-0.081	(0.094)		-0.141	(0.048)	**
Mother age				0.004	(0.002)	^	0.004	(0.003)		0.005	(0.003)	^	0.013	(0.005)	*	0.001	(0.003)	
Mother education																		
Less than high school				0.011	(0.030)		0.016	(0.031)		0.041	(0.030)		0.073	(0.048)		0.004	(0.038)	
High school diploma or GED				0.001	(0.028)		-0.001	(0.029)		0.010	(0.027)		0.015	(0.047)		-0.001	(0.033)	
Post-secondary education (reference)				---	---		---	---		---	---		---	---		---	---	
Mother's parent experienced depression				0.095	(0.024)	***	0.095	(0.024)	***	0.061	(0.023)	**	0.057	(0.040)		0.063	(0.029)	*
Mother income-to-poverty ratio				-0.022	(0.005)	***	-0.022	(0.005)	***	-0.018	(0.005)	***	-0.036	(0.015)	*	-0.012	(0.004)	**
Mother material hardship				0.082	(0.010)	***	0.079	(0.010)	***	0.046	(0.010)	***	0.028	(0.015)	^	0.060	(0.013)	***
Mother relationship status with father																		
Married				0.013	(0.041)		0.020	(0.042)		0.034	(0.040)		0.088	(0.074)		0.034	(0.049)	
Cohabiting				0.118	(0.042)	**	0.119	(0.042)	**	0.093	(0.040)	*	0.098	(0.065)		0.078	(0.051)	
Non-residential relationship				0.113	(0.052)	*	0.117	(0.052)	*	0.090	(0.050)	^	0.034	(0.076)		0.148	(0.069)	*
Separated (reference)				---	---		---	---		---	---		---	---		---	---	
Mother involved with new partner				-0.029	(0.043)		-0.032	(0.043)		0.029	(0.042)		0.046	(0.057)		0.033	(0.062)	
Mother relationship quality with father				0.118	(0.013)	***	0.115	(0.013)	***	0.078	(0.013)	***	0.079	(0.022)	***	0.077	(0.016)	***
Mother parenting stress				-0.129	(0.016)	***	-0.129	(0.016)	***	-0.074	(0.016)	***	-0.064	(0.029)	*	-0.081	(0.019)	***
Mother report of shared responsibility in parenting				0.001	(0.018)		0.001	(0.018)		0.001	(0.018)		0.027	(0.028)		-0.027	(0.023)	
Mother report of cooperation in parenting				0.044	(0.021)	*	0.044	(0.021)	*	0.027	(0.020)		0.009	(0.030)		0.049	(0.027)	^
Mother report of father engagement				-0.057	(0.013)	***	-0.057	(0.013)	***	-0.039	(0.012)	**	-0.037	(0.020)	^	-0.038	(0.015)	*

Father race															
Black				0.089	(0.057)		0.084	(0.055)		0.096	(0.102)		0.056	(0.065)	
Hispanic				0.106	(0.050)	*	0.092	(0.047)	*	0.069	(0.090)		0.099	(0.054)	^
Other race				0.114	(0.065)	^	0.109	(0.063)	^	0.072	(0.115)		0.095	(0.076)	
White (reference)				---	---		---	---		---	---		---	---	
Father foreign-born				-0.046	(0.048)		-0.053	(0.002)		-0.123	(0.097)		-0.020	(0.049)	
Father age				-0.001	(0.002)		-0.001	(0.044)		-0.002	(0.004)		0.001	(0.002)	
Father education															
Less than high school				-0.027	(0.032)		-0.027	(0.030)		-0.080	(0.053)		0.004	(0.037)	
High school diploma or GED				0.003	(0.029)		-0.001	(0.028)		-0.037	(0.053)		0.010	(0.034)	
Post-secondary education (reference)				---	---		---	---		---	---		---	---	
Father impulsivity				-0.029	(0.015)	^	-0.026	(0.015)	^	-0.026	(0.023)		-0.028	(0.017)	
Father engaged in domestic violence				0.020	(0.049)		0.009	(0.047)		-0.055	(0.060)		0.203	(0.076)	**
Father drug or alcohol abuse				0.075	(0.033)	*	0.050	(0.031)		0.049	(0.044)		0.043	(0.044)	
Mother life dissatisfaction (lagged)							0.287	(0.018)	***	0.284	(0.029)	***	0.285	(0.024)	***
Constant	1.566		1.641		1.689			1.151			1.039			1.279	
R-squared	0.047		0.173		0.178			0.242			0.194			0.269	
N	3,826		3,826		3,826			3,826			1,492			2,334	

Notes: All models include city fixed-effects. Standard errors are in parentheses. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4. Logistic Regression Models Predicting Mother's Depression by Father's Incarceration with Mechanisms

	Model 1			Model 2			Model 3			Model 4		
Father recently incarcerated	0.150	(0.131)		0.170	(0.130)		0.136	(0.132)		0.051	(0.140)	
Father ever incarcerated	0.106	(0.119)		0.130	(0.117)		0.119	(0.118)		0.088	(0.122)	
Change in mother income-to-poverty ratio	-0.041	(0.033)								-0.020	(0.031)	
Change in mother material hardship	0.527	(0.044)	***							0.491	(0.045)	***
Mother relationship status with father												
Married				-0.151	(0.229)					-0.003	(0.255)	
Cohabiting				-0.302	(0.223)					-0.204	(0.252)	
Non-residential relationship				0.557	(0.252)	*				0.578	(0.260)	*
Separated				---	---					---	---	
Mother involved with new partner				-0.449	(0.157)	**				-0.346	(0.164)	*
Change in mother relationship quality with father				0.244	(0.051)	***				0.221	(0.063)	**
Change in mother parenting stress							-0.533	(0.081)	***	-0.470	(0.087)	***
Change in mother report of shared responsibility in parenting							-0.045	(0.090)		0.068	(0.107)	
Change in mother report of cooperation in parenting							-0.020	(0.079)		0.069	(0.091)	
Change in mother report of father engagement							-0.091	(0.263)	*	-0.076	(0.046)	^
Constant	-3.660			-4.130			-2.783			(3.807)		
Pseudo R-squared	0.206			0.176			0.180			0.226		
N	3,826			3,826			3,826			3,826		

Notes: All models include covariates from Model 4 of Table 2. Models include city fixed-effects. Standard errors are in parentheses. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5. OLS Regression Models Predicting Mother's Life Dissatisfaction by Father's Incarceration with Mechanisms

	Model 1			Model 2			Model 3			Model 4		
Father recently incarcerated	0.057	(0.031)	^	0.045	(0.032)		0.046	(0.032)		0.024	(0.032)	
Father ever incarcerated	0.022	(0.026)		0.026	(0.026)		0.022	(0.026)		0.015	(0.026)	
Change in mother income-to-poverty ratio	-0.014	(0.005)	*							-0.008	(0.005)	
Change in mother material hardship	0.130	(0.012)	***							0.111	(0.012)	***
Mother relationship status with father												
Married				-0.077	(0.047)					-0.050	(0.050)	
Cohabiting				-0.041	(0.042)					-0.023	(0.046)	
Non-residential relationship				0.051	(0.060)					0.044	(0.059)	
Separated				---	---					---	---	
Mother involved with new partner				-0.180	(0.036)	***				-0.147	(0.035)	***
Change in mother relationship quality with father				0.095	(0.011)	***				0.089	(0.013)	***
Change in mother parenting stress							-0.160	(0.019)	***	-0.136	(0.019)	***
Change in mother report of shared responsibility in parenting							-0.035	(0.019)	^	0.001	(0.020)	
Change in mother report of cooperation in parenting							-0.028	(0.019)		0.020	(0.020)	
Change in mother report of father engagement							0.007	(0.009)		-0.001	(0.009)	
Constant	1.198			0.960			1.480			1.162		
R-squared	0.275			0.269			0.265			0.307		
N	3,826			3,826			3,826			3,826		

Notes: All models include covariates from Model 4 of Table 2. Models include city fixed-effects. Standard errors are in parentheses. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A1. Propensity Score Models Estimating the Effect of Recent Paternal Incarceration on Maternal Mental Health

			Depression			Life dissatisfaction		
	Treatment N	Control N	B	S.E.		B	S.E.	
Nearest neighbor matching	727	2,956	0.061	(0.021)	**	0.131	(0.040)	***
Radius matching	727	2,956	0.056	(0.020)	**	0.141	(0.037)	***
Kernel matching	727	2,956	0.059	(0.020)	**	0.152	(0.036)	***

Notes: Standard errors are in parentheses. ** $p < 0.01$, *** $p < 0.001$.

Table A2. Results from Sensitivity Analysis for Average Treatment Effects (Assuming Overestimation of the Treatment Effect)

Depression						Life dissatisfaction					
Nearest neighbor		Radius		Kernel		Nearest neighbor		Radius		Kernel	
Gamma	P	Gamma	P	Gamma	P	Gamma	P	Gamma	P	Gamma	P
1.0	< 0.001	1.0	< 0.001	1.0	< 0.001	1.0	< 0.001	1.0	< 0.001	1.0	< 0.001
1.1	0.001	1.1	< 0.001	1.1	< 0.001	1.1	< 0.001	1.1	< 0.001	1.1	< 0.001
1.2	0.012	1.2	< 0.001	1.2	< 0.001	1.2	0.006	1.2	< 0.001	1.2	< 0.001
1.3	0.060	1.3	< 0.001	1.3	0.001	1.3	0.044	1.3	< 0.001	1.3	< 0.001
1.4		1.4	0.007	1.4	0.011	1.4	0.173	1.4	< 0.001	1.4	< 0.001
1.5		1.5	0.039	1.5	0.053	1.5		1.5	0.002	1.5	0.001
1.6		1.6	0.130	1.6		1.6		1.6	0.015	1.6	0.011
1.7		1.7		1.7		1.7		1.7	0.070	1.7	0.056
1.8		1.8		1.8		1.8		1.8		1.8	
1.9		1.9		1.9		1.9		1.9		1.9	
2.0		2.0		2.0		2.0		2.0		2.0	

Notes: All p-values are based on one-sided significance tests. Results are based on sensitivity analyses implemented using STATA-compatible software designed by Becker and Caliendo (2007) and Leuven and Sianesi (2003). P-values exceeding .10 have been omitted (unless they were the point where the relationship became statistically insignificant at the .05 level) to make obvious the point where the relationships become statistically insignificant.