

Redefining Relationships:
Countervailing Consequences of Paternal Incarceration for Parenting *

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ABSTRACT

In response to dramatic increases in imprisonment, a burgeoning literature considers the consequences of incarceration for family life, almost always documenting negative consequences. But the effects of incarceration may be more complicated and nuanced and, in this paper, we consider the countervailing consequences of paternal incarceration for both fathers' and mothers' parenting. Using longitudinal data from the Fragile Families and Child Wellbeing Study and a rigorous research design, we find recent paternal incarceration sharply diminishes the parenting behaviors of residential fathers but not nonresidential fathers. Furthermore, virtually all of the association between incarceration and parenting among residential fathers can be explained by changes in fathers' relationships with their children's mothers. The consequences for mothers' parenting, however, are inconsistent and weak, as recent paternal incarceration is not associated with any measure of maternal parenting across all modeling strategies. Our findings also show recent paternal incarceration sharply increases the probability a mother will repartner, potentially offsetting some losses in the involvement of the biological father while simultaneously leading to greater family complexity. Taken together, the collateral consequences of paternal incarceration for family life are complex and countervailing.

In response to dramatic increases in imprisonment, a burgeoning literature considers the consequences of incarceration for the employment, family life, and civic engagement of formerly imprisoned men, almost always documenting negative consequences (Wakefield and Uggen 2010). Yet mass imprisonment may not be solely consequential for the men who churn through the criminal justice system. A new wave of research suggests it is also relevant – and mostly detrimental – for those connected to the incarcerated who experience the cycle of imprisonment and release with them (Braman 2004; Comfort 2007, 2008; Hagan and Dinovitzer 1999; Murray and Farrington 2008a, 2008b; Wakefield and Uggen 2010; Western and Wildeman 2009; Wildeman, Schnittker, and Turney 2012; Wildeman and Western 2010). For some families, incarceration may be a new form of instability that is distinct from other demographic trends in family life (Cherlin 2010).

But the consequences of incarceration on family life may be more complicated than this existing literature suggests (Sampson 2011). Indeed, much qualitative research on the effects of incarceration presents a nuanced picture, likely because it often considers consequences for multiple family members simultaneously. In one of the most vivid accounts, Nurse (2002:52-54) documents how incarceration socializes men to handle conflict rapidly and with extreme violence. Yet at the same time, Nurse (2002:117) also documents potential benefits by showing how incarceration gives some women the opportunity to repartner with men who may be more engaged fathers (and romantic partners) than biological fathers. In a similar vein, Braman (2004:198) describes how a romantic partner's incarceration can lead to crushing depression for women left behind. Yet Comfort (2008:193) shows how, for individuals living in communities bereft of social services, the incarceration of an addicted romantic partner can lead to short-term

improvements in relationship quality and may even curtail abuse for some women (Comfort 2008:162; Western 2006:159).

Existing research, thus, leaves us with a quandary. Much research points toward incarceration harming family life. But other research—often qualitative research considering broad aspects of family life—paints a nuanced portrait in which incarceration sometimes undermines family life, sometimes improves it, and sometimes has no effect on it (Sampson 2011). These seemingly disparate findings suggest that, to fully understand the likely complex and countervailing effects of incarceration on family life, it is important to consider the consequences of incarceration for all those involved. In this study, we heed the findings from the qualitative research and add nuance to the quantitative research by considering the consequences of paternal incarceration for one aspect of family life, parenting. We consider how the incarceration of a father influences his parenting, the parenting of his child's mother, and the likelihood the mother will repartner, thereby leaving the biological father behind. We also consider how pre-incarceration residential status moderates the association between paternal incarceration and parenting. By considering multiple aspects of family life, we provide a thorough assessment of the complex and countervailing effects of incarceration, a task necessary for constructing an incarceration ledger (Sampson 2011).

The emphasis on parenting behaviors is ideal for four reasons. First, both high-quality paternal (Amato and Gilbreth 1999; Choi and Jackson 2011; Furstenberg, Morgan, and Allison 1987; Hawkins et al. 2007; King 1994; Whitaker, Orzol, and Kahn 2006) and maternal (Amato and Fowler 2002; Simons et al. 1994) parenting are more strongly associated with child wellbeing than parenting quantity (i.e., whether the father has contact with the child). Second, although some research considers how incarceration affects parenting quantity (Geller and

Garfinkel 2012; Swisher and Waller 2008; Waller and Swisher 2006), none that utilizes a broadly representative longitudinal sample has considered the quality of parenting (for research using select samples, see Bronte-Tinkew and Horowitz 2010; Modecki and Wilson 2009). Third, nearly all accounts of the harmful effects of paternal incarceration on children speculate changes in parenting behaviors partially mediate this association (e.g., Wildeman 2010). Finally, research on poor families residing in urban areas (Furstenberg 1995; Seltzer and Brandreth 1994) strongly suggests the changes in family life connected to incarceration should diminish fathers' parenting behaviors but provide little hint about how it should affect mothers.

In considering the consequences of paternal incarceration for family life, we use data from the Fragile Families and Child Wellbeing Study, a longitudinal survey of 4,898 mostly unmarried parents of children born in urban areas between 1998 and 2000. These data provide a unique opportunity to examine how paternal incarceration is linked to parenting among fathers and mothers. First, because they were designed to examine the capabilities of unmarried parents, parents who have a disproportionate amount of contact with the criminal justice system (e.g., Chung 2011), they include a large number of ever-incarcerated men (45% of fathers in our sample). Second, they include repeated indicators of both incarceration and parenting, making it possible to carefully consider the time-ordering of the dependent, explanatory, and control variables and employ rigorous modeling strategies that more closely isolate the effects of incarceration than prior research. Finally, these data include a wealth of information about multiple adults connected to the focal child, as well as information about the children, making it possible to adjust for pre-existing differences between families that have and have not experienced paternal incarceration. By using these data to consider how paternal incarceration shapes the parenting of both fathers and mothers, our study provides the first quantitative

evidence of the ways in which the incarceration of a biological father could diminish, enhance, and have no effect on the parenting contexts of disadvantaged children.

BACKGROUND

Mass Imprisonment and the American Family

The American incarceration rate has risen dramatically since the mid-1970s, increasing the number of families affected by the criminal justice system. In 2009, 2.3 million U.S. residents were incarcerated in prisons or jails (West 2010), and an additional 5.1 million adults were on probation or parole (Glaze and Bonzcar 2009). Incarceration, though, is not evenly distributed across the population and this phenomenon has especially transformed the life course of minority men (Pettit and Western 2004; Western and Wildeman 2009) living in neighborhoods of concentrated disadvantage (Sampson and Loeffler 2010). Thus, in an era where incarceration is both common and enormously unequally distributed, mass imprisonment may have substantial implications for racial and class inequality (Pettit and Western 2004; Sampson and Loeffler 2010; Wakefield and Uggen 2010; Western and Wildeman 2009).

High incarceration rates among poor, minority men were initially seen as problematic mostly to the degree that they exacerbated earnings inequality (e.g., Western 2002), but recent research documents myriad consequences of incarceration. Prior incarceration diminishes earnings (Western 2002, 2006), leads to the accumulation of legal debt (Harris, Evans, and Beckett 2010), impedes political participation (Uggen, Manza, and Thompson 2006; Weaver and Lerman 2010), compromises health (e.g., Massoglia 2008a, 2008b; Schnittker and John 2007), and increases the risk of union dissolution (e.g., Lopoo and Western 2005; Massoglia, Remster, and King 2011), to name just a few negative outcomes. And even the few benefits of

incarceration, such as the mortality reduction while incarcerated (e.g., Mumola 2007; Patterson 2010), are offset by the dramatically elevated mortality risks faced upon release (e.g., Binswanger et al. 2007).

Research on the consequences of incarceration for family life arrives at a number of confounding conclusions, however. On the one hand, much research considering the effects of paternal incarceration on children links paternal incarceration with elevated mental health and behavioral problems (Geller et al. 2012; Wakefield and Wildeman 2011; Wildeman 2010), as well as higher risks of high school dropout (Foster and Hagan 2007, 2009), delinquency (Roettger and Swisher 2011), drug use (Roettger et al. 2011), obesity (Roettger and Boardman 2012), and a host of other problems later in adulthood (Murray and Farrington 2005, 2008a, 2008b). Even absent findings that show negative effects on children, results tend to suggest null effects for some outcomes but not others (e.g., Geller et al. 2012; Murray, Loeber, and Pardini 2012) or protective effects only for some groups of children (e.g., Wildeman 2010). Quantitative research on how paternal incarceration affects current and former romantic partners echoes these findings, as research finds women attached to previously incarcerated men, compared to their counterparts, have more mental health problems (Wildeman et al. 2012), increased financial hardships (Schwartz-Soicher, Geller, and Garfinkel 2011), and lower levels of social support (Turney, Schnittker, and Wildeman forthcoming).

But qualitative research paints a sometimes disparate picture of how paternal incarceration affects family life, possibly because it more often considers multiple family members, for whom the consequences of incarceration may vary somewhat dramatically depending on the outcome. Although most studies emphasize the average negative effects of incarceration on family life (e.g., Braman 2004; Comfort 2008; Nurse 2002), some suggest null

effects (Giordano 2010:147-150) and most acknowledge the incarceration of a family member entails a number of complex and often countervailing effects on family life (see especially Comfort 2007, 2008; see also Braman 2004). Indeed, as Braman (2004:42) notes, for many families, incarceration is bittersweet, providing short-term solace from a possibly destructive family member while also generally damaging family life in the long term.

Effects of Paternal Incarceration on Fathers' Parenting

A focus on the relationship between paternal incarceration and fathers' parenting is especially important since research suggests a number of channels through which incarceration might directly and indirectly influence parenting. The *direct* effects of current incarceration on fathers' parenting are perhaps most obvious. During incarceration, fathers are unable to engage with their children, potentially leading to long-term reductions in involvement as fathers and their children grow accustomed to this separation (Swisher and Waller 2008). Such effects are paradoxical since qualitative research on nonresident (Edin, Nelson, and Paranal 2004) and juvenile (Nurse 2002) fathers experiencing incarceration suggest time away from children often increases fathers' desire for involvement. Despite these intentions, time apart often has the opposite effect, reducing paternal involvement (Nurse 2002). In this regard, incarceration is comparable to other prolonged absences (such as military deployment [Massoglia et al. 2011]), as the extended time away from children may inhibit future paternal involvement even in the absence of other changes in family life.

In addition to the direct effects of paternal incarceration, the relationship between paternal incarceration and fathers' parenting may operate through a number of indirect channels. First, incarceration may diminish fathers' parenting behaviors by disrupting his relationship with

his child's mother. Although incarceration allows some couples to regroup, finding their relationship stride in ways they had been unable to outside of prison walls (Comfort 2008), the preponderance of evidence suggests changes in the structure and quality of romantic relationships are more often negative than positive. Whether because of stigma or time apart (Massoglia et al. 2011), incarceration dramatically increases the risk of divorce and separation (Apel et al. 2010; Lopoo and Western 2005).

Beyond family instability, qualitative evidence suggests incarceration poisons relationship dynamics. Nurse (2002) documents how prolonged father absence associated with incarceration leads to changes in routines among fathers and mothers alike that damage their relationship. For fathers, prolonged exposure to the harsh prison environment socializes men to use violence to resolve problems (Nurse 2002:52-54), which could make a tumultuous transition from prison to home even rockier. With respect to mothers, Nurse (2002:109) highlights how many young women gain independence during their partner's incarceration (as we discuss in detail later), leading them to grow further apart after his release. Beyond this, for fathers on parole, this liminal status further shifts power dynamics toward the mother (Goffman 2009:348; Nurse 2002:110), potentially leading to greater instability in already strained romantic relationships. Given that much of fathers' involvement is contingent on his relationship with the child's mother, such resulting relationship instability is likely associated with fathers' parenting challenges.

Beyond changes in romantic relationships, a number of additional consequences of incarceration could diminish fathers' parenting. On the most basic level, incarceration limits men's abilities to garner employment (Pager 2003) and, contingent upon employment, is associated with lower earnings (Western 2002, 2006). Thus, recently incarcerated fathers,

compared to their counterparts, may simply be less able to prioritize involvement with their children, consistent with research documenting that economically marginalized fathers are less likely than their counterparts to be engaged parents (e.g., Nelson 2004).

Finally, the association between paternal incarceration and fathers' parenting may operate indirectly through fathers' health and wellbeing. The toll incarceration takes on men's physical health is widely established, in that incarceration is associated with functional limitations (Schnittker and John 2007), infectious and stress-related diseases (Massoglia 2008a), and poor self-rated health (Massoglia 2008b). And research suggests that, stemming from the psychological stresses associated with confinement, incarceration is associated with a wide array of mental health problems (Haney 2006). Thus, these physical and mental health problems stemming from incarceration may mean recently incarcerated fathers are less able than their counterparts to actively participate in their children's lives, as health problems may lead to less favorable parenting (e.g., Davis et al. 2011).

There are also reasons to expect the consequences of paternal incarceration for parenting differ depending on fathers' pre-incarceration residential status. For one, although the little existing quantitative research suggests global negative consequences for fathers' involvement (Geller and Garfinkel 2012; Waller and Swisher 2006; though see Swisher and Waller 2008 for a focus on nonresident fathers), a close inspection of the qualitative literature shows that, in most instances when paternal incarceration diminishes fathers' involvement, fathers are living with children prior to incarceration (Braman 2004; Nurse 2002). Speaking generally, research on residential fathers suggests incarceration may dramatically depress fathers' parenting by increasing the probability of union dissolution (Apel et al. 2010; Lopoo and Western 2005), taxing the relationship between parents who stay together (Nurse 2002), and causing a difficult

to repair rift between fathers and children (Braman 2004; Nurse 2002). To the degree fathers' relationships with children's mothers link paternal incarceration with decreased involvement, associations will be concentrated among residential fathers.

Research on nonresidential fathers also suggests average negative effects, although some of this evidence is restricted to juveniles (Nurse 2002; though see Swisher and Waller 2008). Beyond the concentration of harm, of the few examples that suggest incarceration increases paternal involvement, most such cases involved fathers nonresidential prior to incarceration (Edin et al. 2004). None of this is to suggest, however, that incarceration should not decrease paternal involvement *somewhat* among nonresidential fathers, as negative effects on nonresidential fathers are plausible. Nonetheless, in light of the limited existing research, we expect the consequences to be largest for residential fathers.

Effects of Paternal Incarceration on Mothers' Parenting

Fathers do not exist in isolation. Like all fathers, ever-incarcerated fathers are embedded in social networks comprised of, among others, current and former romantic partners, and there is mounting evidence incarceration has spillover effects on these partners (e.g., Comfort 2007). Mothers experience a multitude of hardships during and after the incarceration of a romantic partner. For example, paternal incarceration is linked to depression and life dissatisfaction among mothers (Wildeman et al. 2012), even if a loved one's incarceration may provide a respite for women whose partners are troubled or violent (Comfort 2008). Given that maternal mental health problems diminish aspects of parenting (Turney 2011), the relationship between paternal incarceration and maternal parenting may operate indirectly through mothers' health and wellbeing. Other changes resulting from paternal incarceration, such as decreases in fathers'

financial contributions (Geller, Garfinkel, and Western 2011) and increases in mothers' material hardship (Schwartz-Soicher et al. 2011) also suggest harm.

Yet there are also reasons to expect null—or even positive—effects. For one, the literature on paternal incarceration provides little guidance. Existing research focuses mostly on parenting of fathers (Nurse 2002), romantic relationships between mothers and their incarcerated partners (Comfort 2008), and family life more broadly (Braman 2004) rather than maternal parenting. When women are the focus, emphasis is placed squarely on their relationships (e.g., Comfort 2008) and wellbeing (e.g., Wildeman et al. 2012) rather than their parenting. Therefore, knowing exactly what to expect with respect to mothers' parenting is difficult. And despite the negative consequences of paternal incarceration for women left behind, there are multiple reasons to expect mothers to hold their parenting behaviors constant. For one, a vast qualitative literature on the extensive familial and kin support in low-income black communities (Aschenbrenner 1973; Stack 1974), precisely the communities in which incarceration is so common (Sampson and Loeffler 2010; Wakefield and Uggen 2010), suggests that this familial safety net may buffer mothers from experiencing negative effects (though see Desmond 2012; Turney et al. forthcoming). Also in favor of null, or even positive, effects is the fact that the incarceration of a romantic partner, especially one struggling with addiction, may provide respite—albeit in only a fleeting way—for some women (e.g., Comfort 2008). Or, if they seek to offset the potentially harmful effects of paternal incarceration on their children, women may compensate by increasing the quantity and quality of time spent with children.

Paternal Incarceration and the Emergence of a New (Social) Father

Thus, much research on incarceration and family life suggests paternal incarceration is likely associated with substantial declines in fathers' parenting, and associations with mothers' parenting are more uncertain. In light of this prior research, children of incarcerated fathers likely experience a less favorable "package" of parenting (e.g., Carlson and Berger 2010), as the (sometimes) dramatic loss in fathers' parenting is unlikely offset by comparable improvements in mothers' parenting.

Yet for some children of incarcerated parents, paternal incarceration will result in the dissolution of their parents' relationships (Apel et al. 2010; Lopoo and Western 2005; Massoglia et al. 2011). As noted earlier, the effects of relationship dissolution for biological fathers' parenting may be severe. Yet since relationship dissolution may increase the chance mothers will repartner (Nurse 2002), some of these children will also have a social father added into their "package" of parenting. Such changes are relevant for the full parenting contexts children are exposed to because mothers who become involved in new romantic relationships after the birth of a child, on average, repartner with men who are more advantaged than their children's biological fathers, possibly improving their children's parenting contexts (Bzostek, McLanahan, and Carlson 2012; also see Cherlin 2009). It is not clear, though, as to whether these repartnerships would benefit children, as relationship instability more broadly is associated with negative outcomes for mothers (Cooper et al. 2009) and children (Cooper et al. 2011).

Despite the many reasons to expect the incarceration of a biological father would increase the likelihood the child has a social father and the equally long list of reasons to expect such a change to be relevant for the parenting contexts children experience, no quantitative study has rigorously investigated this relationship. In addition to considering how the incarceration of a

biological father affects the parenting behaviors of both biological parents, we also expect incarceration will increase the probability a mother repartners.

Selection into Incarceration

Despite these reasons to expect that paternal incarceration compromises the parenting of fathers, positively or negatively affects the parenting of mothers, and increases the likelihood mothers find new romantic partners who are more engaged fathers, it may also be the case that any statistical relationships detected result from social selection processes. For instance, incarcerated fathers are almost certainly less likely involved with their children than other fathers, on average, given the many obstacles they face to effective parenting. Likewise, women who share children with these men confront a number of obstacles to effective parenting, meaning they will likely experience more stress and less engagement with their children regardless of whether the fathers are incarcerated. Finally, the portrait of relationships prior to incarceration is often one of instability (e.g., Giordano 2010:147-150), suggesting many mothers would leave their children's fathers and move on to new partners regardless of incarceration (e.g., Nurse 2002). These sources of social selection suggest that absent a dataset allowing us to adjust for extensive time-varying and fixed covariates, it is difficult to believe any relationship shown here—whether positive, negative, or null—does not result from selection processes.

DATA, MEASURES, AND ANALYTIC STRATEGY

Data

We use data from the Fragile Families and Child Wellbeing Study, a longitudinal survey of 4,898 new and mostly unmarried parents in 20 U.S. cities with populations greater than

200,000 (Reichman et al. 2001). Between February 1998 and September 2000, mothers completed an in-person interview at the hospital after the birth of their child. Fathers were interviewed as soon as possible after the focal child's birth. Mothers and fathers were re-interviewed when their children were about one, three, five, and nine years old. We use data from the first four survey waves and focus on parenting when children are five years old, given the critical importance of this life course stage (Entwisle and Alexander 1989). An additional advantage to examining parenting at the five-year survey is that it allows us to examine changes in incarceration and parenting over a short time span (between the three- and five-year surveys).

The analytic sample comprises 3,571 of the 4,898 families in the baseline sample. We made efforts to preserve as many respondents as possible. We first dropped the 1,051 observations in which the mother did not participate in the three- or five-year surveys, and we excluded an additional 276 observations missing data on any of our outcome variables.¹ We used multiple imputation to preserve observations missing other values (Royston 2007), including variables related to the research questions or to the likelihood of being missing in the imputation model (Allison 2002). The analytic sample is generally more advantaged than the full sample, as parents in the analytic sample are less likely to be racial minorities, more likely to have education beyond high school, and more likely to be married at baseline.

Measures

Dependent variables. Our key outcome variables include measures of fathers' and mothers' parenting at the five-year survey. We examine four indicators of fathers' parenting:

¹ Our examination of fathers' parenting stress includes only 2,334 observations, as this outcome was only reported by fathers (as opposed to other measures of fathers' parenting that were reported by mothers). Because a relatively large percentage of fathers (35%) did not complete the five-year survey, we did not want to restrict all outcomes to this limited sample. However, in supplemental analyses not presented, findings for other parenting outcomes are robust to dropping observations in which the father did not participate in the five-year survey.

engagement, shared responsibility in parenting, cooperation in parenting, and parenting stress. Consistent with much other research on fathers' parenting (Berger et al. 2008; Guzzo 2009; Swisher and Waller 2008; Tach, Mincy, and Edin 2010) and to avoid censoring by attrition of uninvolved fathers, we present results using maternal reports of fathers' outcomes (with the exception of fathers' parenting stress, which was only reported by the father).² First, mothers were asked how often fathers engaged in various activities with the focal child including singing songs, reading stories, or telling stories (0 = *never* to 7 = *seven days a week*), and our final measure of engagement averages these responses. Shared responsibility in parenting comprises the average of mothers' responses to questions about how often the father does things such as look after the child (1 = *never* to 4 = *often*). Cooperation in parenting comprises the average of mothers' responses to questions about how often the father does things such as respects the schedules and rules she makes for the child (1 = *never* to 4 = *always*). Finally, parenting stress is measured by fathers' responses to questions that tap into stresses associated with the parental role (1 = *strongly disagree* to 4 = *strongly agree*). We also examine two parallel indicators of maternal parenting, engagement and parenting stress (in addition to shared responsibility in parenting and cooperation in parenting, which are arguably about both fathers' and mothers' parenting).³ In some multivariate models, we adjust for parenting at the three-year survey.⁴ See Table A1 for a description of all variables.

² Both mothers and fathers reported on fathers' engagement with the focal child. The correlation between mothers' and fathers' reports was .55 for engagement. Supplemental analyses (described below) show findings are robust to using father-reported outcomes.

³ Only some fathers reported on mothers' shared responsibility in parenting and cooperation in parenting at the five-year survey. Fathers were asked about mothers' shared responsibility in parenting if he had primary or joint custody of the child and were asked about mothers' cooperation in parenting if the mother had any contact with the child. Given these skip patterns and attrition among fathers, we do not examine these outcomes.

⁴ Because parental engagement with children may vary by the children's developmental age, the measure of engagement does not comprise identical questions at the three- and five-year surveys.

Explanatory variable. Our key explanatory variable is recent paternal incarceration. Fathers experienced recent incarceration if they were incarcerated between the three- and five-year surveys or at the five-year survey. We rely on maternal and paternal reports of incarceration, and assume the father was incarcerated if either report is affirmative.⁵ Though these data provide an exceptional opportunity to examine how incarceration affects family life, and are commonly used to answer such questions, the measure of recent incarceration is limited with respect to the duration and type of incarceration. It is likely incarceration lasting one week is differentially associated with parenting than incarceration lasting one year, and it is possible being in prison is differentially associated with parenting than being in jail. We discuss this in more detail below.

Control variables. The multivariate analyses adjust for individual-level characteristics that may render the association between recent paternal incarceration and parenting spurious, all measured at or before the three-year survey and, thus, prior to recent paternal incarceration. We control for race, immigrant status, age, education, number of children, multi-partnered fertility, fathers' importance of childrearing tasks, and fathers' parenthood beliefs. We control extensively for parents' relationship (relationship status, presence of a new partner, relationship quality, and mothers' trust in the father), economic wellbeing (employment, income-to-poverty ratio, and material hardship), and health and wellbeing (fair or poor health and major depression) at the three-year survey. Our multivariate models also adjust for four paternal characteristics repeatedly linked to incarceration: impulsivity, domestic violence, substance abuse, and prior incarceration (a dummy variable indicating the father was ever incarcerated at or before the three-year survey,

⁵ Robustness checks in which paternal incarceration is coded using (1) only fathers' reports or (2) only mothers' reports provides substantively similar results.

according to the mother or father). Finally, the multivariate analyses control for three child characteristics (gender, age, and temperament).

Mechanisms. In some analyses, we examine three sets of mechanisms that may explain the relationship between recent paternal incarceration and parenting: changes in parents' relationship, changes in fathers' economic wellbeing, and changes in fathers' health. Changes in parents' relationship includes parents' relationship status at the five-year survey, change in relationship quality between the three- and five-year surveys, change in mothers' trust in the father between the three- and five-year surveys, and a dummy variable indicating the mother refused to let the father see the child in the past two years.⁶ Economic wellbeing includes changes in employment, changes income-to-poverty ratio, and changes in material hardship between the three- and five-year surveys. Finally, parental health includes changes in fair/poor health and depression between the three- and five-year surveys.

Analytic Strategy

We consider the following four sets of analyses: (1) the association between recent paternal incarceration and fathers' parenting; (2) the association between recent paternal incarceration and mothers' parenting; (3) the mechanisms underlying the association between recent paternal incarceration and fathers' parenting; and (4) the association between recent paternal incarceration and mothers' repartnering.

Recent paternal incarceration and fathers' parenting. In the first analytic stage (Table 3), we use three methods to estimate fathers' parenting as a function of recent paternal

⁶ Reasons for refusal include the following: child did not want to visit father; father not good with child; father drunk, violence, abusive; father incarcerated; father does not show; court order/custody battle; safety, housing, lifestyle; father's new family; parents don't get along; and no child support. Other reasons for refusal, such as a time conflict or a sick child, are coded as 0. It is not possible to measure change in this measure, as this question was not asked prior to the five-year survey.

incarceration: (1) ordinary least squared (OLS) regression models; (2) fixed-effect models; and (3) propensity score models. Each methodological strategy provides useful information on its own and, taken together, they provide a robust examination of the association between recent incarceration and fathers' parenting. We consider findings that hold up across all three modeling strategies to be the most robust. Because residential and nonresidential fathers parent across vastly different contexts and we expect any consequences of incarceration to be most pronounced for residential fathers, we present analyses separately for residential fathers and nonresidential fathers at the three-year survey (prior to our measurement of recent incarceration).

In estimating fathers' parenting, Model 1 adjusts for a wide array of control variables that precede recent incarceration, including prior incarceration (see table note for details). Model 2 includes these controls and also adjusts for a lagged dependent variable. In this model, any remaining association between recent paternal incarceration and parenting at the five-year survey is *net* of parenting at the three-year survey. In Model 3, we restrict the sample to fathers who reported prior incarceration (incarceration at or prior to the three-year survey). By examining only those who experienced prior incarceration, we restrict the sample to fathers at risk of incarceration and, thus, diminish unobserved heterogeneity and strengthen causal inference (LaLonde 1986). Readers should keep in mind that limiting the sample to previously incarcerated men necessitates estimating the link between an *additional* incarceration and parenting. These and all models include city fixed-effects because observations were clustered in 20 cities.

Then, we take two additional steps to diminish observed and unobserved heterogeneity. In Model 4, we present fixed-effects models that estimate how entry into recent incarceration is associated with changes in fathers' parenting between the three- and five-year surveys, net of unobserved stable characteristics and observed time-varying characteristics. By examining

within-person changes, we account for the possibility that some individuals may simply have a greater stable propensity for criminal activity. Finally, in Model 5, we present results from propensity score matching models estimating *changes* in parenting. Propensity score matching is a way to diminish concerns about pre-existing differences between groups by matching individuals on the distribution of their observed covariates (Morgan and Harding 2006; Rosenbaum and Rubin 1983). This method approximates an experimental design by using observed variables to comprise a treatment group (in this case, recently incarcerated fathers) and a control group (not recently incarcerated fathers). Though propensity score matching does not eliminate bias due to unobserved variables, it makes the treatment and control groups as similar as possible, which is especially beneficial given the stark differences between recently incarcerated fathers and not recently incarcerated fathers.⁷

Recent paternal incarceration and mothers' parenting. In the second analytic stage, we consider the association between recent paternal incarceration and mothers' parenting (Table 4). We again use OLS regression models, fixed-effect models, and propensity score models to triangulate the association between recent paternal incarceration and parenting. These models proceed in a similar fashion as those estimating fathers' parenting, though we generally adjust for mothers' characteristics instead of fathers' characteristics (see table note for details).

⁷ When generating the propensity score, we include all control variables included in the OLS regression models. After generating propensity scores for each observation and ensuring the treatment and control groups are balanced, we match observations on the probability of experiencing recent incarceration. We restrict the analysis to regions of common support and use three types of matching procedures: nearest neighbor matching, radius matching, and kernel matching (Morgan and Harding 2006). We use nearest neighbor matching with replacement, meaning each control observation can be matched to more than one treatment observation. Radius matching compares each treatment observation with control observations within a specific radius (caliper = .005). Kernel matching compares each treatment observation with all control observations, but weights these observations according to their distance from treatment cases (bandwidth = .006; kernel = Gaussian). All propensity score analyses were conducted using Stata (Becker and Ichino 2002). Because the Stata commands for estimating propensity score models cannot be used appropriately with multiple imputed data sets, we estimate these models for the first imputed data set. The results presented are robust to using different single data sets. Though we only present results from kernel matching in Table 3, we present results from additional matching procedures in Table A4.

Explaining the association between recent paternal incarceration and fathers' parenting. In the third analytic stage, we explain the relationship between recent paternal incarceration and fathers' parenting with OLS models to establish appropriate time ordering between incarceration and parenting (Table 5). All models include the full set of control variables included in Model 2 of Tables 3 and 4. In Model 1 of Table 5, we present the recent incarceration coefficient from these models to use as a starting point for understanding mechanisms. We individually add in three sets of mechanisms: changes in parents' relationship between the three- and five-year surveys (Model 2), changes in fathers' economic wellbeing between the three- and five-year surveys (Model 3), and changes in fathers' health between the three- and five-year surveys (Model 4). Model 5 includes all mechanisms.

Recent paternal incarceration and mothers' repartnering. The fourth and final analytic stage, which is primarily descriptive, considers mothers' relationships with new partners. We use multinomial logistic regression models to estimate mothers' relationship status at the five-year survey as a function of fathers' recent incarceration. We consider the probability of both *separating from the father and remaining single* and *separating from the father and repartnering*, compared to staying with the father. These analyses are restricted to mothers living with the focal child's father at the three-year survey. Model 1 adjusts for a wide array of control variables (see table note for details) and Model 2 includes these controls and restricts the sample to women attached to biological fathers who experienced prior incarceration.

Sample Description

In Table 1, we present descriptive statistics of all variables, by parents' residential status. Consistent with expectations, fathers' parenting varies by residential status. For example,

residential fathers spend an average of 3.2 days per week engaged in various activities with their five-year-old children, while nonresidential fathers spend an average of 1.0 day engaged in such activities ($p < .001$). Compared to nonresidential fathers, residential fathers have greater shared responsibility in parenting ($p < .001$) and cooperation in parenting ($p < .001$). They report slightly less parenting stress ($p < .10$). Further, recent incarceration is common among fathers, especially nonresidential fathers. About 8% of residential and 30% of nonresidential fathers experienced incarceration between the three- and five-year surveys.

[Table 1 about here.]

RESULTS

Bivariate Relationship between Recent Paternal Incarceration and Parenting

In Table 2, we present descriptive statistics of fathers' and mothers' parenting by recent paternal incarceration, separately by parents' residential status at the three-year survey. These descriptive statistics demonstrate substantial differences in parenting between residential fathers with and without recent incarceration. For example, recently incarcerated residential fathers report less engagement with their five-year old children. Recently incarcerated residential fathers spend, on average, 1.8 days a week engaging in activities with their children, compared to their counterparts who spend an average of 3.3 days a week engaging in these activities ($p < .001$). Recently incarcerated residential fathers also have less shared responsibility in parenting (2.318, compared to 3.326, $p < .001$), less cooperation in parenting (3.140, compared to 3.691, $p < .001$), and more parenting stress (2.120, compared to 2.006, $p < .10$). The descriptive differences by recent incarceration persist for nonresidential fathers. Recently incarcerated nonresidential

fathers have significantly less engagement ($p < .001$), less shared responsibility in parenting ($p < .001$), less cooperation in parenting ($p < .001$), and more parenting stress ($p < .001$).

[Table 2 about here.]

With respect to mothers' parenting, there are some descriptive differences between mothers attached and not attached to recently incarcerated men. Mothers attached to recently incarcerated residential fathers, compared to their counterparts, report more parenting stress ($p < .001$), and these patterns persist for mothers attached to nonresidential fathers. With respect to mothers' engagement, though, no descriptive differences exist.

Estimating Fathers' Parenting as a Function of Recent Paternal Incarceration

Residential fathers. The descriptive differences in fathers' parenting by recent paternal incarceration are substantial, though these differences may be spurious. Thus, in Table 3, we present multivariate results estimating fathers' parenting as a function of recent paternal incarceration. We turn first to residential fathers (Panel A). Each row represents a different regression model and the coefficients shown are for recent paternal incarceration.⁸ In Model 1 estimating fathers' engagement, which adjusts for a wide array of control variables, recent paternal incarceration is associated with about 1.3 fewer days of engagement ($p < .001$). When we adjust for a lagged dependent variable in Model 2, the size of the recent incarceration coefficient decreases slightly and remains statistically significant (-1.262, $p < .000$). In Model 3, which includes all covariates from Model 3 but restricts the sample to fathers with prior incarceration, recent paternal incarceration is associated with about one fewer day of engagement (-.996, $p < .001$).

⁸ See Tables A2 and A3 for full models estimating paternal engagement, and full tables for other outcomes are available upon request.

In the remaining models, we use two additional modeling strategies—fixed-effects and propensity score models—to triangulate our finding that recent incarceration is associated with less engagement among residential fathers. The coefficient from the fixed-effects model (Model 4) is smaller in magnitude than the coefficient from the most conservative OLS model (Model 3), suggesting the importance of time-invariant unobserved characteristics and time-varying observed characteristics. This coefficient, though, is substantively meaningful, as it translates into more than two-fifths of a standard deviation ($-.725, p < .001$). Propensity score models (Model 5) also suggest that recent incarceration is associated with less engagement, and this coefficient translates into more than two-thirds of a standard deviation ($-1.153, p < .001$).

[Table 3 about here.]

We next estimate shared responsibility in parenting among residential fathers. Model 1 shows a statistically significant association between recent paternal incarceration and shared responsibility in parenting ($-.812, p < .001$), and this association persists in Model 2 (when we adjust for a lagged dependent variable [$-.763, p < .001$]) and in Model 3 (when we limit the sample to previously incarcerated fathers [$-.629, p < .001$]). The coefficients from the fixed-effects model (Model 4) and the propensity score model (Model 5) are slightly smaller in magnitude, translating, respectively, into nearly half of a standard deviation ($-.404, p < .001$) and more than three-quarters of a standard deviation ($-.679, p < .001$). Taken together, these alternative modeling strategies lend further confidence in our findings.

The estimates of residential fathers' cooperation in parenting are consistent. Recent paternal incarceration is associated with less cooperation in parenting, net of both individual characteristics and prior cooperation in parenting, and this association persists in the most conservative OLS model (Model 3) ($-.306, p < .01$). Again, these findings persist across different

modeling strategies. The coefficient from the fixed-effects model (Model 4) translates into nearly one-third of a standard deviation ($-.183, p < .001$), and the coefficient from the propensity score model (Model 5) translates into more than one-half of a standard deviation ($-.321, p < .001$).

Parenting stress comprises our final outcome. The OLS models (Models 1 through 3) and the propensity score model (Model 5) show no statistically significant association between recent incarceration and fathers' parenting stress. The fixed-effect model (Model 4) suggests that recently incarcerated fathers, net of unobserved time-invariant characteristics and observed time-varying characteristics, have less parenting stress given their fixed traits ($-.146, p < .05$).⁹

Nonresidential fathers. We next turn to nonresidential fathers (Panel B). For the first outcome, engagement, the OLS models show recent paternal incarceration is associated with less engagement. According to the most conservative OLS model (Model 3), recently incarcerated fathers engage with their children nearly one-half of a day less than their counterparts. This translates to about one-quarter of a standard deviation ($-.424, p < .001$). Contrary to results for residential fathers, the recent incarceration coefficient falls from statistical significance and substantially decreases in magnitude in Model 4 ($-.070, n.s.$), suggesting nearly all of the association between recent paternal incarceration and engagement among nonresidential fathers results from unobserved time-invariant characteristics. The coefficient from the propensity score model (Model 5) is smaller in magnitude than the OLS models and larger in magnitude than the fixed-effects model. Recent paternal incarceration is similarly associated with shared

⁹ Prior research finds race/ethnic differences in the association between incarceration and fathers' contact with children (Swisher and Waller 2008). Further, previous research suggests domestic violence or incarceration history may moderate the association between incarceration and child wellbeing (Wildeman 2010). In supplemental analyses (available upon request), we tested interactions between recent incarceration and race/ethnicity, between recent incarceration and domestic violence, and between recent incarceration and incarceration history (father incarcerated previously). There is no evidence the association between fathers' incarceration and parenting vary by race/ethnicity or domestic violence, and limited evidence that the association between recent incarceration and parenting vary by incarceration history. For residential fathers, the association between recent incarceration and engagement are stronger for fathers experiencing a first-time incarceration than for fathers experiencing a higher order incarceration.

responsibility in parenting and cooperation in parenting. Recent incarceration is associated with less shared responsibility in parenting and cooperation in parenting in the OLS models (Models 1 through 3) and in the propensity score model (Model 5), but the association falls to statistical insignificance in the fixed-effects model (Model 4). With respect to the final outcome, all models show recent incarceration is not associated with parenting stress among nonresidential fathers.

Taken together, compared to findings among residential fathers, findings among nonresidential fathers are not robust across modeling strategies. Post-hoc tests of equality lend confidence to this interpretation. For engagement, shared responsibility in parenting, and cooperation in parenting, the association between recent incarceration and parenting are statistically different for residential and nonresidential fathers across nearly all models.

Alternative specifications. We consider the robustness of our results with two alternative specifications. In the first, we restrict the sample to observations in which the father had at least some contact with the focal child in the past 30 days at the five-year survey. This specification allows us to examine how recent paternal incarceration is associated with parenting, conditional on *any* involvement at the five-year survey, as even fathers residential at the three-year survey may not see their child at the five-year survey. Across most models for residential fathers, this alternative specification produced substantively similar, though smaller, findings (available upon request).¹⁰ In the second alternative specification, we replace mothers' reports with fathers' reports when possible (available upon request). For the outcome that has both

¹⁰ In the most conservative OLS model estimating engagement among residential fathers (Model 3 of Table 3, Panel A), the recent incarceration coefficient was -.490 (compared to -.996 in the full sample). Similarly, for residential fathers, the recent incarceration coefficient was -.478 (compared to -.629) for shared responsibility in parenting and -.260 (compared to -.306) for cooperation in parenting. In the most conservative OLS model estimating engagement among nonresidential fathers (Model 3 of Table 3, Panel B), the recent incarceration coefficient was -.455 (compared to -.424 in the full sample) for engagement, -.250 (compared to -.181) for shared responsibility in parenting, and -.291 (compared to -.198) for cooperation in parenting.

mothers' and fathers' reports, engagement, results are robust to using fathers' reports, suggesting the findings are not driven by mothers' reporting bias.¹¹

Estimating Mothers' Parenting as a Function of Recent Paternal Incarceration

Mothers with residential fathers. We examine the association between recent paternal incarceration and mothers' parenting in Table 4, first among mothers living with the child's father at the three-year survey (Panel A). Consistent with descriptives, recent paternal incarceration is not associated with mothers' engagement in any of the three OLS models or the propensity score model. However, in the fixed-effect model (Model 4), recent incarceration is associated with a statistically significant *increase* in mothers' engagement (.279, $p < .01$). This coefficient translates into about one-fourth of a standard deviation and suggests mothers may increase their engagement with their children when fathers are recently incarcerated.

[Table 4 about here.]

We next estimate mothers' parenting stress as a function of recent paternal incarceration. The OLS models suggest recent paternal incarceration is associated with more parenting stress among mothers and fathers living together at the three-year survey. The fixed-effect (Model 4) and propensity score (Model 5) models show no association between recent incarceration and parenting. Given the relatively small magnitude of the OLS coefficients (Model 3 translates to one-fifth of a standard deviation) and the statistical insignificance of the more stringent modeling strategies, we conclude this relationship is not robust.

¹¹ Supplemental analyses show that, in the most conservative OLS model for residential fathers (Model 3 of Table 3, Panel A), the recent incarceration coefficient for father-reported engagement was -.705 (compared to -.996 for mother-reported engagement). In the most conservative OLS models for nonresidential fathers (Model 4 of Table 3, Panel B), the recent incarceration coefficient for father-reported engagement was -.682 (compared to -.424 for mother-reported engagement).

Mothers with nonresidential fathers. We next consider the association between recent paternal incarceration and mothers' parenting among mothers not living with the child's father at the three-year survey (Panel B). Across both outcomes and models, there is no association between recent paternal incarceration and mothers' parenting.

Explaining the Recent Paternal Incarceration-Fathers' Parenting Relationship

Taken together, the results presented above suggest recent paternal incarceration is robustly associated with fathers' engagement, shared responsibility in parenting, and cooperation in parenting among residential—but not nonresidential—fathers. It was never consistently associated with mothers' parenting, however. In the next analytic stage, we focus on explaining the relationship between recent paternal incarceration and these three aspects of residential fathers' parenting. In Table 5, as in the prior multivariate tables, each row represents a separate regression model and we present only the recent incarceration coefficients. The first model, which is the equivalent of Model 2 from Table 3, provides a baseline estimate for the subsequent models.

[Table 5 about here.]

Residential fathers. We turn first to estimates of engagement among residential fathers. We adjust for changes in the parents' relationship between the three- and five-year surveys in Model 2. We include all four indicators of parents' relationship simultaneously in the model, as a chi-square test revealed joint significance ($F=287.20, p < .001$). The recent incarceration coefficient falls by 71% from Model 1, though the coefficient remains statistically significant ($-.363, p < .05$). When we enter each mechanism individually, we find 64% of the association is explained by parents' relationship status and 36% is explained by change in mothers' trust in the

father. Mothers' refusal to let the father see the child and change in relationship quality explain less of the association (13% and 17%, respectively). We adjust for changes in fathers' economic wellbeing in Model 3 and changes in fathers' health in Model 4, neither of which substantially reduce the magnitude of the recent incarceration coefficient. In the final model, which includes all potential mechanisms, recent paternal incarceration is reduced but still associated with engagement among residential fathers ($-.390, p < .05$), suggesting some direct effects.

We next turn to explaining the association between recent paternal incarceration and shared responsibility in parenting. Similar to our estimates of engagement, adjusting for changes in parents' relationship explains a substantial portion—80%—of the association between recent incarceration and shared responsibility in parenting, and the coefficient falls to marginal significance ($-.149, p < .10$). Again, entering in each of the four measures individually shows that relationship status and change in mothers' trust in the father are responsible for much of the decrease in the recent incarceration coefficient (explaining 71% and 38% of the association, respectively). Changes in fathers' economic wellbeing (Model 3) and changes in fathers' health (Model 4) explain 0% and 5% of the association, respectively. In the final model, the association between recent incarceration and shared responsibility in parenting is small and marginally significant ($-.145, p < .10$). The estimates of cooperation in parenting are similar to those of shared responsibility in parenting, with changes in parents' relationship explaining 93% of the association, with changes in fathers' economic wellbeing and changes in father's health explaining little of this association, and with all mechanisms reducing the recent incarceration coefficient to statistical insignificance ($.024, n.s.$). Taken together, these findings suggest much

of the negative association between incarceration and parenting among fathers results from changes in his relationship with children's mothers.¹²

Estimating Mothers' Repartnership as a Function of Recent Paternal Incarceration

The above analyses show recent paternal incarceration is robustly associated with fathers' parenting, especially among residential fathers, and also show much of the relationship between recent paternal incarceration and mothers' parenting results from processes of social selection. But mothers' lives may be affected in other ways and, for some, the incarceration of a child's father may give mothers an opportunity to repartner, which we consider in Table 6. These analyses are restricted to mothers living with the child's biological father at the three-year survey ($n = 1,894$). The first set of results estimates the odds of separating from the father and remaining single compared to staying with the father. In Model 1, which adjusts for a wide array of control variables, we find recent incarceration is associated with a greater likelihood of separating from the father and remaining single ($1.500, p < .001$ [OR = 4.48]). This association persists in Model 2, which restricts the sample to mothers attached to fathers who experienced prior incarceration, with mothers attached to recently incarcerated fathers having 3.42 times the odds of breaking up with the father and remaining single, compared to staying with the father ($1.229, p < .001$).

[Table 6 about here.]

The second set of results estimate the odds of separating from the father and repartnering compared to staying with the biological father. Again, recent incarceration is associated with a

¹² The above analyses use mothers' reports of fathers' parenting. It is possible mothers experiencing substantial changes in relationships with fathers are simply more likely to report lower father engagement, regardless of fathers' actual engagement. In analyses not presented (available upon request), we substitute fathers' reports of engagement and find that changes in the parents' relationship substantially reduces the association between recent paternal incarceration and engagement. For example, including indicators of change in the parents' relationship reduces the recent incarceration coefficient by 57%, which is less than the 71% explained when using mothers' reports of engagement but still quite substantial.

greater likelihood of breaking up with the father and repartnering, and this association persists across both models. In the most conservative model (Model 2), the coefficient shows mothers attached to recently incarcerated men have 7.63 times the odds of separating from the father and repartnering (2.032, $p < .001$). Supplemental analyses (not presented) show that, in this most conservative model, the coefficients for remaining single and for repartnering are marginally different from one another, such that mothers attached to recently incarcerated men are more likely to repartner than to remain single ($p < .10$).¹³

DISCUSSION

In an era where incarceration is increasingly common and enormously unequally distributed, a burgeoning body of literature suggests incarceration may exacerbate social inequalities not only among adult men who increasingly cycle through the penal system but also for those attached to them, including their children and the women with whom they share children (Comfort 2007; Wakefield and Uggen 2010; Wildeman and Western 2010). When this widening social inequality is combined with the fact that the crime-fighting benefits of imprisonment have declined substantially since the early 1990s (Johnson and Raphael

¹³ Though we find strong evidence that the incarceration of a partner is associated with relationship dissolution and that some women go on to repartner, the above analyses tell us nothing about the men with whom these women repartner. Examining the parenting among these new partners may provide an especially insightful portrait of these social fathers and, in Table A5, we present descriptive statistics of biological father and social father parenting at the five-year survey, by biological fathers' recent incarceration status. We turn first to descriptive statistics when the biological father was recently incarcerated. Social fathers, compared to biological fathers, have more favorable engagement and shared responsibility in parenting, though have comparable cooperation in parenting. For example, social fathers are engaged in activities with the focal child nearly four days a week, compared to biological fathers who are engaged less than half a day per week ($p < .001$). These differences between biological and social fathers are similar when biological fathers were not recently incarcerated. Importantly, there are no statistically significant differences in social fathers' parenting based on the biological fathers' recent incarceration. Taken together, these supplemental analyses suggest mothers, regardless of the biological fathers' recent incarceration experiences, go on to find new partners who are involved fathers.

forthcoming), much research points toward an incarceration ledger (Sampson 2011) that suggests mass imprisonment creates a host of social ills while diminishing crime only a small amount.

We add to this growing literature on the collateral consequences of incarceration by considering the consequences of paternal incarceration for one important aspect of family life, parenting. We use longitudinal data from the Fragile Families and Child Wellbeing Study, a data source suited to examine the consequences of incarceration for family life. We also use a rigorous research design that includes multiple methods to consider how recent paternal incarceration is linked to fathers' and mothers' parenting, as well as mothers' opportunity to repartner. In so doing, we present a full, complicated picture of how paternal incarceration influences the broad parenting contexts children experience and thereby lend novel insight into how mass imprisonment improves, hinders, and is not associated with family functioning.

We come to five conclusions about the association between recent paternal incarceration and parenting. First, we find that paternal incarceration is robustly and negatively associated with fathers' engagement, shared responsibility in parenting, and cooperation in parenting but not their parenting stress. Paternal incarceration most strongly affects fathers' engagement with their children and their ability to co-parent with their children's mothers, especially when mothers and fathers live together prior to incarceration. This is consistent with a rich body of qualitative (Braman 2004; Edin et al. 2004; Nurse 2002; Waller and Swisher 2006) and quantitative (Geller and Garfinkel 2012; Modecki and Wilson 2009; Swisher and Waller 2008; Waller and Swisher 2006) research documenting how incarceration disrupts time spent with children. But we find no robust or consistent evidence that paternal incarceration is linked to parenting stress. With respect to parenting stress, the results vary across modeling strategies. The OLS and propensity score models show no link between recent incarceration and parenting stress. This is in contrast

to fixed-effects models showing recently incarcerated fathers report *less* parenting stress, consistent with the notion they are no longer participating in the daily rigors and stresses of parenting. We caution readers from putting too much stock in the differences between the OLS and fixed-effects models, as the OLS models include all fathers and the fixed-effects models include only those experiencing change between the three- and five-year surveys. Regardless, the findings for parenting stress are consistent with the negative consequences incarceration has on other measures of parenting.

Second, we find the associations between recent paternal incarceration and parenting are only robust for residential fathers. Though recent incarceration is robustly associated with three aspects of parenting – engagement, shared responsibility in parenting, and cooperation in parenting – among residential fathers, these findings fall to statistical insignificance when estimating fixed-effects models for nonresidential fathers. Though existing quantitative research provides little guide for how incarceration may differentially affect residential and nonresident fathers, our findings are consistent with guidance provided by qualitative studies (Braman 2004; Edin et al. 2004; Nurse 2002).

Third, virtually all of the association between paternal incarceration and parenting is explained by changes in fathers' relationships with mothers. Changes in the parents' relationship, among parents residential prior to incarceration, explain 71% of the association between incarceration and engagement, 80% of the association between incarceration and shared responsibility in parenting, and 93% of the association between incarceration and cooperation in parenting. These findings are consistent with existing literature. Incarceration dramatically increases the risk of divorce and separation (Apel et al. 2010; Lopoo and Western 2005) and leads to changes in relationship quality and dynamics (Nurse 2002), all of which may decrease

father involvement given the “package deal” of fatherhood (Tach et al. 2010; Townsend 2002). Similarly, research suggests that mothers, based on their assessments of fathers’ suitability as parents, have the power to control fathers’ involvement by restricting fathers’ access to children (Claessens 2007; Daly 1993; Fagan and Barnett 2003; Waller and Swisher 2006). Contrary to expectations, changes in fathers’ economic wellbeing and changes in fathers’ health contribute virtually nothing to the association between recent paternal incarceration and parenting. For one, it is possible that post-incarceration changes in income and employment status have offsetting effects on fathers’ parenting. Recently incarcerated fathers may experience reductions in income that impede parenting but also experience unemployment that increases time availability (e.g., Braman 2004). Similarly, mothers may be more likely to work when residential fathers are unemployed, which may increase fathers’ time spent with children (Raley, Bianchi, and Wang 2012). With respect to health, it is possible the declines in health associated with incarceration are not severe enough for fathers to experience parenting impairments.

Fourth, we find no consistent evidence that paternal incarceration is associated with mothers’ parenting. For example, the OLS models provide no evidence that paternal incarceration is associated with engagement among residential mothers, but the fixed-effects models suggest that paternal incarceration is associated with *more* engagement. Similarly, among residential mothers, the OLS models suggest paternal incarceration is associated with more parenting stress, consistent with expectations (e.g., Wildeman et al. 2012), but these findings fall from statistical significance when we consider within-person changes in the fixed-effects models. Since much of the existing research on the consequences of parental imprisonment for child wellbeing speculates that changes in both paternal and maternal parenting behaviors associated with parental imprisonment explain any negative linkages, these findings are especially relevant

since they suggest that paternal behaviors may be the key driver. Though paternal incarceration is not particularly salient for mothers' parenting, it is indeed consequential for mothers in that it dramatically alters their relationships with fathers.

Finally, our results demonstrate paternal incarceration is associated with a dramatic increase in the probability of breaking up with the biological father and repartnering with a social father. This is consistent with the fact that changes in the parents' relationship drives the association between incarceration and fathers' parenting. The relationship dissolution side of this story is consistent with the broader literature on the consequences of incarceration for relationship stability (Lopoo and Western 2005), yet the repartnering side of the story is new to the quantitative literature. On the one hand, the incarceration of a biological father may improve child wellbeing, as supplemental analyses show social fathers are more involved in parenting across a range of domains and an emerging literature documents that women trade up to better partners and fathers (e.g., Bzostek et al. 2012). On the other hand, repartnering is a form of family instability, which often has negative consequences for both mothers (Cooper et al. 2009) and their children (Cooper et al. 2011). Future research should further unpack these relationships.

Limitations

Several limitations should be kept in mind when interpreting these findings. First, although our key explanatory variable is recent incarceration, a discrete measure of incarceration within the past two years, incarceration experiences are sufficiently complex that we cannot disentangle them all. We do not, for example, have good measures of the timing of prior incarceration, which is why we can only control for prior incarceration. As discussed earlier, we also do not have reliable measures of incarceration duration or type (prison versus jail). Other

features of the incarceration experience—such as experiences surrounding the arrest, visitation from family members, or distance incarcerated from family—remain unmeasured as well.

Additionally, our measures of parenting are limited in several ways. First, we consider mostly positive dimensions of parenting. This is a data limitation, as information about negative aspects of parenting – such as neglect or more detailed questions about physical assault – only exists for a smaller, select sample of mothers (those who participated in the In-Home survey) and for no fathers. Supplemental analyses (not presented but available upon request) document no robust association between recent paternal incarceration and maternal neglect or physical assault, consistent with our findings about maternal parenting. Similarly, we do not consider feedback loops between our measures of parenting (e.g., Carlson, McLanahan, and Brooks-Gunn 2008) or between the parenting of biological fathers, biological mothers, and social fathers. For example, it is possible that increases in involvement among social fathers – and the mere presence of social father – may increase or decrease engagement of biological fathers (Nurse 2002:115), and future research should consider such feedback effects.

Conclusions

Our findings suggest a nuanced relationship between paternal incarceration and the parenting of mothers and fathers who share children together, consistent with what the richly textured qualitative literature in this area has suggested for years. In so doing, we demonstrate that future quantitative research on the consequences of incarceration on family life must be acutely attentive to the fact that incarceration may affect different individuals in the family in complex—and often countervailing—ways. Indeed, the incarceration of a father may have negative consequences for some family members and either positive or null consequences for

other family members. Without paying significantly more attention to how incarceration affects the full complement of characters involved in family life, our understanding of the consequences of mass imprisonment for inequality in family life will remain limited, as will our ability to construct an incarceration ledger (Sampson 2011).

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Table 1. Descriptive Statistics of All Variables Included in Analyses, by Fathers' Residential Status at Three-Year Survey

	Fathers				Mothers			
	Residential fathers ^a		Nonresidential fathers		Residential fathers		Nonresidential fathers	
	Mean or %	S.D.	Mean or %	S.D.	Mean or %	S.D.	Mean or %	S.D.
<i>Dependent variables</i>								
Engagement (range: 0-7; y3)	4.020	(1.260)	1.183	(1.689)	4.996	(0.884)	4.980	(0.941)
Engagement (range: 0-7; y5)	3.223	(1.667)	1.033	(1.645)	4.634	(1.161)	4.665	(1.165)
Shared responsibility in parenting (range: 1-4; y3)	3.461	(0.547)	1.777	(0.999)	---		---	
Shared responsibility in parenting (range: 1-4; y5)	3.247	(0.876)	1.695	(0.989)	---		---	
Cooperation in parenting (range: 1-4; y3)	3.780	(0.312)	2.546	(1.140)	---		---	
Cooperation in parenting (range: 1-4; y5)	3.648	(0.598)	2.445	(1.185)	---		---	
Parenting stress (range: 1-4; y3)	2.064	(0.676)	2.147	(0.705)	2.211	(0.645)	2.295	(0.696)
Parenting stress (range: 1-4; y5)	2.013	(0.686)	2.059	(0.737)	2.138	(0.656)	2.230	(0.710)
Repartnership (y5)								
Break up with father and remain single	---		---		24.8%		---	
Break up with father and repartner	---		---		24.7%		---	
Stay with father	---		---		50.5%		---	
<i>Explanatory variable</i>								
Recent incarceration (y5) ^b	7.8%		29.6%		---		---	
<i>Control variables</i>								
Race (b)								
White	28.3%		8.6%		30.0%		12.0%	
Black	36.4%		67.6%		34.0%		65.7%	
Hispanic	31.1%		21.0%		31.4%		19.9%	
Other race	4.2%		2.8%		4.6%		2.3%	
Foreign-born (b)	21.6%		9.3%		21.5%		7.4%	
Age (y3)	31.916	(6.995)	29.600	(7.130)	29.560	(6.162)	26.704	(5.538)
Education (y3)								
Less than high school	25.4%		31.8%		24.0%		32.0%	
High school diploma or GED	27.0%		41.2%		23.3%		27.1%	
More than high school	47.6%		27.0%		53.1%		41.0%	
Number of children (y3)	1.876	(1.393)	0.917	(1.383)	2.307	(1.254)	2.321	(1.401)
Multipartnered fertility (y3)	28.7%		61.3%		29.1%		55.7%	
Importance of childrearing tasks (range: 1-3; b)	2.948	(0.130)	2.942	(0.145)	---		---	
Beliefs about fatherhood (range: 1-4; b)	3.758	(0.404)	3.638	(0.480)	---		---	
Relationship status (y3)								
Married	62.5%		0.0%		62.5%		0.0%	
Cohabiting	37.5%		0.0%		37.5%		0.0%	
Nonresidential romantic relationship	0.0%		12.2%		0.0%		12.2%	
Separated	0.0%		87.8%		0.0%		87.8%	
In a new relationship (y3)	0.0%		38.6%		0.0%		37.6%	
Relationship quality (y3)	4.113	(0.921)	2.711	(1.346)	4.028	(0.919)	2.182	(1.281)
Mother trusts father (y3)	---		---		92.3%		41.0%	
Employed (y3)	86.3%		67.6%		55.2%		58.6%	
Income-to-poverty ratio (y3)	2.898	(3.249)	2.299	(2.767)	2.640	(3.105)	1.206	(1.244)
Material hardship (y3)	1.136	(1.389)	1.611	(1.523)	1.294	(1.466)	1.968	(1.751)
Depression (y3)	10.6%		19.5%		15.8%		24.3%	
Fair or poor health (y3)	7.9%		10.0%		9.9%		15.9%	
Impulsivity (y1)	1.936	(0.639)	2.129	(0.696)	---		---	
Domestic violence (y3)	1.4%		14.9%		---		---	
Substance abuse (y3)	3.3%		18.1%		---		---	
Prior incarceration (b, y1, y3) ^c	26.4%		60.6%		---		---	
Child is male (b)	---		---		51.5%		52.3%	
Age of child in months (y5)	---		---		61.587	(2.824)	61.755	(0.499)
Child temperament (range: 1-5; y1)	3.334	(0.735)	3.146	(0.766)	3.462	(0.743)	3.330	0.768
<i>Mechanisms</i>								
Mother refuses to let child see father (y5)	---		---		0.018		0.063	
Change in trust in father (y3, y5)	---		---		-0.071	(0.371)	-0.010	(0.502)
Relationship status (y5)								
Married	60.8%		2.3%		---		---	
Cohabiting	20.6%		5.7%		---		---	
Nonresidential romantic relationship	2.3%		4.9%		---		---	

Separated	16.3%		87.1%		---	---
Change in relationship quality (y3, y5)	-0.191	(1.074)	0.086	(1.334)	---	---
Change in employment (y3, y5)	0.004	(0.399)	0.002	(0.537)	---	---
Change in income-to-poverty ratio (y3, y5)	0.216	(2.583)	-0.098	(2.694)	---	---
Change in material hardship (y3, y5)	0.293	(1.824)	0.355	(2.063)	---	---
Change in depression (y3, y5)	-0.016	(0.361)	-0.029	(0.469)	---	---
Change in fair or poor health (y3, y5)	0.013	(0.314)	0.035	(0.366)	---	---
N	1,894		1,673		1,894	1,673

Notes: b: measured at baseline; y1: measured at one-year survey; y3: measured at three-year survey; y5: measured at five-year survey. With the exception of father's parenting stress, all parenting variables are reported by mothers. N is for all variables except fathers' parenting stress. The N for fathers' parenting stress is 1,592 for residential fathers and 742 for nonresidential fathers.

^a Residential fathers include all fathers living with the mother and focal child at the three-year survey. Nonresidential fathers include all fathers not living with the mother and focal child at the three-year survey.

^b Recent incarceration includes any paternal incarceration taking place after the three-year survey and up to and including the five-year survey.

^c Prior incarceration includes any paternal incarceration taking place up to and including the three-year survey.

Table 2. Descriptive Statistics of Fathers' and Mothers' Parenting at Five-Year Survey, by Recent Paternal Incarceration

Panel A. Residential Fathers^a

	Fathers		Mothers	
	Recent incarceration ^b	No recent incarceration	Recent incarceration	No recent incarceration
	Mean or %	Mean or %	Mean or %	Mean or %
Engagement	1.819	3.342 ***	4.606	4.636
Shared responsibility in parenting	2.318	3.326 ***	---	---
Cooperation in parenting	3.140	3.691 ***	---	---
Parenting stress	2.120	2.006 ^	2.261	2.127 ***
N	148	1,746	148	1,746

Panel B. Nonresidential Fathers

	Fathers		Mothers	
	Recent incarceration	No recent incarceration	Recent incarceration	No recent incarceration
	Mean or %	Mean or %	Mean or %	Mean or %
Engagement	0.588	1.221 ***	4.673	4.661
Shared responsibility in parenting	1.474	1.789 ***	---	---
Cooperation in parenting	2.152	2.569 ***	---	---
Parenting stress	2.205	2.015 ***	2.302	2.200 **
N	494	1,179	494	1,179

Note: For fathers, asterisks indicate statistically significant differences between fathers with recent incarceration and fathers without recent incarceration. For mothers, asterisks indicate statistically significant differences between mothers attached to fathers with recent incarceration and mothers attached to fathers with no recent incarceration. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Residential fathers include all fathers living with the mother and focal child at the three-year survey.

Nonresidential fathers include all fathers not living with the mother and focal child at the three-year survey.

^b Recent incarceration includes any paternal incarceration taking place after the three-year survey and up to and including the five-year survey.

Table 3. Regression Models Estimating Fathers' Parenting at Five-Year Survey as a Function of Recent Paternal Incarceration

Panel A. Residential Fathers^a

	OLS models			Fixed-effect models	Propensity score models (change)
	Model 1	Model 2	Model 3	Model 4	Model 5
	+ controls	+ lagged DV	Prior incarceration	+ controls	Kernel matching
Engagement	-1.328 *** (0.177)	-1.262 *** (0.182)	-0.996 *** (0.230)	-0.725 *** (0.130)	-1.153 *** (0.213)
Shared responsibility in parenting	-0.812 *** (0.109)	-0.763 *** (0.116)	-0.629 *** (0.139)	-0.404 *** (0.065)	-0.679 *** (0.122)
Cooperation in parenting	-0.401 *** (0.073)	-0.370 *** (0.076)	-0.306 ** (0.095)	-0.183 *** (0.050)	-0.321 *** (0.079)
Parenting stress	-0.006 (0.058)	-0.084 (0.056)	-0.064 (0.096)	-0.146 * (0.073)	-0.111 (0.085)
N	1,894	1,894	500	1,894	1,894
Person-year observations	---	---	---	3,788	---

Panel B. Nonresidential Fathers

	OLS models			Fixed-effect models	Propensity score models (change)
	Model 1	Model 2	Model 3	Model 4	Model 5
	+ controls	+ lagged DV	Prior incarceration	+ controls	Kernel matching
Engagement	-0.498 *** (0.071)	-0.417 *** (0.072)	-0.424 *** (0.083)	-0.070 (0.088)	-0.287 ** (0.107)
Shared responsibility in parenting	-0.215 *** (0.042)	-0.179 ** (0.043)	-0.181 ** (0.047)	-0.018 (0.045)	-0.141 * (0.060)
Cooperation in parenting	-0.260 *** (0.060)	-0.191 ** (0.065)	-0.198 * (0.069)	-0.081 (0.060)	-0.161 * (0.070)
Parenting stress	0.106 (0.098)	0.081 (0.090)	0.058 (0.085)	0.024 (0.085)	-0.127 (0.084)
N ^b	1,673	1,673	1,022	1,673	1,673
Person-year observations	---	---	---	3,346	---

Note: Coefficients for recent incarceration shown. All models include city fixed-effects. Standard errors in parentheses. Model 1 adjusts for the following paternal characteristics (unless otherwise noted): race, immigrant status, age, education, number of children, multipartnered fertility, importance of childrearing tasks, beliefs about fatherhood, relationship status with child's mother, new partner, relationship quality with child's mother, mother trusts father to look after child (reported by mother), employment, income-to-poverty ratio, material hardship, depression, fair or poor health, impulsivity, engaged in domestic violence (reported by mother), abused substances (reported by mother and father), prior incarceration (reported by mother and father), child gender (reported by mother), child age (reported by mother), and child temperament. Model 2 includes all variables from Model 1 and a lagged dependent variable. Model 3 includes all variables from Model 2 and restricts the sample to fathers previously incarcerated. Model 4 includes all time-invariant and time-varying controls from Model 2. [^] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Residential fathers include all fathers living with the mother and focal child at the three-year survey. Nonresidential fathers include all fathers not living with the mother and focal child at the three-year survey.

^b For residential parents, Ns for parenting stress include 1,592 (Models 1, 2, 4 and 5) and 396 (Model 3). For nonresidential parents, Ns for parenting stress include 742 (Models 1, 2, 4, and 5) and 420 (Model 3).

Table 4. Regression Models Estimating Mothers' Parenting at Five-Year Survey as a Function of Recent Paternal Incarceration

Panel A. Mothers with Residential Fathers^a

	OLS models			Fixed-effect models	Propensity score models (change)
	Model 1	Model 2	Model 3	Model 4	Model 5
	+ controls	+ lagged DV	Prior incarceration	+ controls	Kernel matching
Engagement	0.029 (0.136)	0.127 (0.108)	0.016 (0.094)	0.279 ** (0.092)	0.163 (0.112)
Parenting stress	0.107 * (0.045)	0.089 * (0.036)	0.129 ** (0.040)	0.015 (0.053)	0.072 (0.061)
N	1,894	1,894	500	1,894	1,894
Person-year observations	---	---	---	3,788	---

Panel B. Mothers with Nonresidential Fathers

	OLS models			Fixed-effect models	Propensity score models (change)
	Model 1	Model 2	Model 3	Model 4	Model 5
	+ controls	+ lagged DV	Prior incarceration	+ controls	Kernel matching
Engagement	-0.004 (0.062)	0.020 (0.058)	-0.019 (0.065)	0.068 (0.068)	-0.025 (0.071)
Parenting stress	0.011 (0.038)	0.036 (0.033)	0.030 (0.038)	0.049 (0.038)	0.043 (0.040)
N	1,673	1,673	1,022	1,673	1,673
Person-year observations	---	---	---	3,346	---

Note: Coefficients for recent incarceration shown. All models include city fixed-effects. Robust standard errors in parentheses. Model 1 adjusts for the following maternal characteristics (unless otherwise noted): race, immigrant status, age, education, number of children, multipartnered fertility, relationship status with child's mother, new partner, relationship quality with child's father, mother trusts father to look after child, employment, income-to-poverty ratio, material hardship, depression, fair or poor health, father impulsivity (reported by father), father engaged in domestic violence, father abused substances (reported by mother and father), father prior incarceration (reported by mother and father), child gender, child age, and child temperament. Model 2 includes all variables from Model 1 and a lagged dependent variable. Model 3 includes all variables from Model 2 and restricts the sample to fathers previously incarcerated. Model 4 includes all time-invariant and time-varying controls from Model 2. * $p < 0.05$, ** $p < 0.01$.

^a Mothers with residential fathers include all mothers living with the father and focal child at the three-year survey. Mothers with nonresidential fathers include all mothers not living with the father and focal child at the three-year survey.

Table 5. OLS Regression Models Estimating Fathers' Parenting at Five-Year Survey as a Function of Recent Paternal Incarceration with Mechanisms, Residential Fathers

	Model 1 <i>baseline</i>	Model 2 <i>+ relationship with mother</i>	Model 3 <i>+ economic wellbeing</i>	Model 4 <i>+ health and wellbeing</i>	Model 5 <i>+ all mechanisms</i>
Engagement	-1.262 *** (0.182)	-0.363 * (0.133)	-1.287 *** (0.188)	-1.218 *** (0.189)	-0.390 * (0.143)
Shared responsibility in parenting	-0.763 *** (0.116)	-0.149 ^ (0.074)	-0.762 *** (0.116)	-0.726 *** (0.119)	-0.145 ^ (0.075)
Cooperation in parenting	-0.370 *** (0.076)	0.027 (0.044)	-0.372 *** (0.077)	-0.350 *** (0.076)	0.024 (0.042)
N	1,894	1,894	1,894	1,894	1,894

Note: Coefficients for recent incarceration shown. All models include city fixed-effects. Robust standard errors in parentheses. Model 1 includes all covariates from Model 2 of Table 3. Model 2 includes all variables from Model 1 and the following: mother refuses to let father see child, change in mother's trust in father, relationship status at five-year survey, change in relationship quality between father and mother. Model 3 includes all variables from Model 1 and the following: change in father's employment status, change in father's income-to-poverty ratio, change in father's material hardship. Model 4 includes all variables from Model 1 and the following: change in father's depression and change in father's fair or poor health. Model 5 includes all covariates. ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Residential fathers include all fathers living with the mother and focal child at the three-year survey.

Table 6. Multinomial Logistic Regression Models Estimating Mothers' Relationship Status with Father at Five-Year Survey by Recent Paternal Incarceration, Conditional on Father Being Residential at Three-Year Survey

	Break up with father and remain single vs. stay with father		Break up with father and repartner vs. stay with father	
	Model 1	Model 2	Model 1	Model 2
	<i>+ controls</i>	<i>Prior incarceration</i>	<i>+ controls</i>	<i>Prior incarceration</i>
Recent incarceration	1.500 *** (0.213)	1.229 ** (0.382)	1.902 *** (0.328)	2.032 *** (0.406)
Constant	-6.732	-8.231	-13.274	-13.252
R-squared	0.194	0.250	0.194	0.250
N	1,894	500	1,894	500

Note: Coefficients for recent incarceration shown. All models include city fixed-effects. Standard errors in parentheses. Model 1 adjusts for the following maternal characteristics (unless otherwise noted): race, immigrant status, age, education, number of children, multipartnered fertility, relationship status with child's father, relationship quality with child's father, mother trusts father to look after child, employment, income-to-poverty ratio, material hardship, depression, fair or poor health, father impulsivity (reported by father), father engaged in domestic violence, father abused substances (reported by mother and father), prior incarceration (reported by mother and father), child gender, child age, and child temperament. Model 2 includes all variables from Model 1 and restricts the sample to mothers attached to previously incarcerated fathers. ** $p < 0.01$, *** $p < 0.001$.

APPENDIX

Table A1. Description of Variables Included in Analyses

DEPENDENT VARIABLES	
Engagement ($\alpha = .94$ for fathers, $\alpha = .69$ for mothers)	0 = 0 days per week to 7 = 7 days per week ^a Sing songs or nursery rhymes with child; read stories to child; tell stories to child; play inside with toys such as blocks or legos with child; tell child he appreciated something he/she did; play outside in the yard, park or playground with child; take child on an outing, such as shopping, or to a restaurant, church, museum, or special activity or event; watch TV or a video together
Shared responsibility in parenting ($\alpha = .94$)	1 = never to 4 = often ^b How often the father looks after child when you need to do things; how often the father runs errands like picking things up from the store; how often the father fixes things around the home, paints, or helps make it look nicer in other ways; how often the father takes the child places he/she needs to go such as to daycare or the doctor
Cooperation in parenting ($\alpha = .96$)	1 = never to 4 = always ^b When father is with child, he acts like the kind of parent you want for your child; you can trust father to take good care of child; father respects the schedules and rules you make for child; father supports you in the way you want to raise child; you and father talk about problems that come up with raising child; you can count on father for help when you need someone to look after child for a few hours
Parenting stress ($\alpha = .65$ for fathers, $\alpha = .66$ for mothers)	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; I often feel tired, worn out, or exhausted from raising a family
EXPLANATORY VARIABLE	
Recent paternal incarceration	Dummy variable indicating the father was incarcerated between the three- and five-year surveys or at the five-year survey
CONTROL VARIABLES	
Race/ethnicity	Mutually exclusive variables indicating respondent's race/ethnicity: non-Hispanic white, non-Hispanic Black, Hispanic, non-Hispanic other race
Immigrant status	Dummy variable indicating respondent born outside of United States
Age	Continuous variable
Education	Mutually exclusive variables indicating respondent's educational

	attainment: less than high school degree, high school diploma or GED, more than high school
Number of children	Continuous variable
Multipartnered fertility	Dummy variable indicating respondent has biological children with more than one partner
Importance of childrearing tasks ($\alpha = .55$)	1 = <i>not important</i> to 3 = <i>very important</i> Provide regular financial support; teach child about life; provide direct care, such as feeding, dressing, and child care; show love and affection to the child; provide protection for the child; serve as an authority figure and discipline the child
Beliefs about fatherhood ($\alpha = .72$)	1 = <i>strongly disagree</i> to 4 = <i>strongly agree</i> Being a father and raising children is one of the most fulfilling experiences a man can have; I want people to know that I have a new child; not being a part of my child's life would be one of the worst things that could happen to me
Relationship status	Mutually exclusive variables indicating respondent's relationship with child's other biological parent: married, cohabiting, nonresidential romantic relationship, separated
In a new relationship	Dummy variable indicating respondent has repartnered
Relationship quality	1 = <i>poor</i> to 5 = <i>excellent</i> ^c
Mother trusts father	Dummy variable indicating mother trusts the father to take care of the child for one week ^d
Employed	Dummy variable indicating the respondent worked in the past week
Income-to-poverty ratio	Continuous variable indicating the ratio of total household income to official poverty threshold established by the U.S. Census Bureau
Material hardship	1 = <i>yes</i> , 0 = <i>no</i> Respondent received free food or meals; child was hungry but couldn't afford enough food; respondent was hungry but didn't eat because he/she couldn't afford enough food; did not pay full amount of rent or mortgage payments; evicted from home or apartment for not paying rent or mortgage; did not pay full amount of a gas, oil, or electricity bill; the gas or electric service was turned off, or the heating oil company did not deliver oil, because there wasn't enough money to pay the bills; borrowed money from friends or family to help pay the bills; moved in with other people even for a little while because of financial problems; stayed at a shelter, in an abandoned building, an automobile, or any other place not meant for regular housing, even for one night; anyone in household who needed to see a doctor or go to the hospital but couldn't go because of the cost;

	cut back on buying clothes for yourself; worked overtime or taken a second job; telephone service was disconnected by the telephone company because there wasn't enough money to pay the bill
Major depression	Dummy variable indicating respondent experienced major depression, as measured by the Composite International Diagnostic Interview-Short Form (CIDI-SF) (Kessler et al. 1998)
Fair or poor health	Dummy variable indicating respondent reported fair or poor health, compared to excellent, very good, or good health
Impulsivity ($\alpha = .84$)	1 = <i>strongly disagree</i> to 4 = <i>strongly agree</i> 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; I often make up my mind without taking the time to consider the situation from all angles
Domestic violence	Dummy variable indicating the mother reported the father hit, slapped, or kicked her
Substance abuse	Dummy variable indicating the father or mother reported drugs or alcohol interfered with the father's work or made it difficult to get a job or get along with friends or family
Prior paternal incarceration	Dummy variable indicating the father was incarcerated at or prior to the three-year survey
Child is male	Dummy variable indicating the child is male
Age of child	Continuous variable
Child temperament ($\alpha = .48$ for fathers, $\alpha = .51$ for mothers)	1 = <i>not at all like my child</i> to 5 = <i>very much like my child</i> Child tends to be shy (reverse coded); child often fusses and cries (reverse coded); child is very sociable; child gets upset easily (reverse coded); child reacts strongly when upset (reverse coded); child is very friendly with strangers

^a Fathers who did not see their child in the past month are coded as 0.

^b Fathers who did not see their child in the past month are coded as 1.

^c Parents were asked about relationship quality if they had *ever* been in a relationship with the child's other parent. The few parents never in a romantic relationship are coded as 1.

^d A similar item, mother's report that she can trust the father to take good care of the child, is included in the cooperation in parenting measure. Consistent with prior research (Berger et al. 2008), we consider this measure to be a distinct and more stringent indicator of trust than that included in the cooperation in parenting measure.

Table A2. OLS and Fixed-Effects Regression Models Estimating Father Engagement at Five-Year Survey as a Function of Recent Paternal Incarceration, Residential Fathers^a

	OLS models			Fixed-effect model
	Model 1	Model 2	Model 3	Model 4
Recent incarceration	-1.328 *** (0.177)	-1.262 *** (0.182)	-0.996 *** (0.230)	-0.725 *** (0.130)
Race				
White (reference)	---	---	---	---
Black	-0.137 (0.094)	-0.098 (0.086)	-0.166 (0.289)	---
Hispanic	-0.238 ^ (0.132)	-0.231 ^ (0.117)	-0.270 (0.284)	---
Other race	0.084 (0.187)	-0.040 (0.159)	-0.057 (0.594)	---
Foreign-born	-0.192 (0.123)	-0.031 (0.100)	-0.130 (0.231)	---
Age	-0.011 ^ (0.005)	-0.006 (0.005)	-0.022 (0.018)	-0.022 (0.078)
Education				
Less than high school (reference)	---	---	---	---
High school diploma or GED	-0.223 * (0.095)	-0.163 ^ (0.089)	-0.187 (0.207)	-0.334 (0.474)
More than high school	-0.038 (0.090)	-0.031 (0.082)	0.285 (0.202)	-0.448 (0.397)
Number of children in household	-0.070 (0.040)	-0.025 (0.033)	-0.035 (0.077)	0.108 ** (0.031)
Multipartnered fertility	-0.014 (0.107)	-0.015 (0.100)	0.143 (0.218)	-1.196 ** (0.362)
Importance of childrearing tasks	0.830 ** (0.199)	0.534 * (0.230)	0.743 (0.766)	---
Beliefs about fatherhood	0.141 (0.093)	0.032 (0.102)	0.103 (0.261)	---
Relationship status with mother				
Married (reference)	---	---	---	---
Cohabiting	-0.048 (0.110)	-0.143 (0.093)	-0.187 (0.135)	---
In a new relationship	-0.266 (0.665)	-0.007 (0.680)	0.466 (0.627)	-1.029 *** (0.177)
Relationship quality	0.229 *** (0.043)	0.141 ** (0.042)	0.067 (0.075)	0.088 * (0.038)
Mother trusts father	0.852 *** (0.112)	0.403 ** (0.127)	0.875 ** (0.220)	1.002 *** (0.097)
Employed	-0.063 (0.174)	0.045 (0.136)	0.009 (0.217)	-0.139 (0.093)
Income-to-poverty ratio	-0.007 (0.013)	-0.008 (0.011)	-0.075 (0.060)	-0.013 (0.014)
Material hardship	-0.022 (0.029)	-0.013 (0.030)	-0.048 (0.067)	-0.006 (0.020)
Depression	-0.047 (0.160)	-0.140 (0.156)	-0.454 (0.273)	0.033 (0.102)
Fair or poor health	-0.057 (0.176)	-0.104 (0.151)	-0.140 (0.301)	0.076 (0.124)

Impulsivity	-0.118 (0.078)	-0.074 (0.073)	-0.027 (0.131)	---
Domestic violence	-0.278 (0.310)	-0.080 (0.338)	0.444 (0.494)	-0.528 ** (0.190)
Substance abuse	-0.174 (0.172)	-0.108 (0.178)	-0.416 (0.424)	-0.177 (0.140)
Prior incarceration	0.055 (0.123)	0.090 (0.105)	---	---
Child is male	-0.090 (0.064)	-0.110 [^] (0.059)	-0.185 (0.164)	---
Child age in months	-0.002 (0.016)	-0.018 (0.014)	-0.083 * (0.037)	-0.021 ** (0.007)
Child temperament	0.107 [^] (0.059)	0.088 (0.057)	0.016 (0.124)	---
Lagged engagement		0.521 *** (0.034)	0.372 *** (0.079)	---
Constant	-0.624	0.144	5.094	4.803
R-squared	0.140	0.278	0.279	0.358
N	1,894	1,894	500	1,894
Person-year observations	---	---	---	3,788

Note: All models include city fixed-effects. Robust standard errors in parentheses. [^] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Residential fathers include all fathers living with the mother and focal child at the three-year survey.

Table A3. OLS and Fixed-Effects Regression Models Estimating Father Engagement at Five-Year Survey as a Function of Recent Paternal Incarceration, Nonresidential Fathers^a

	OLS models			Fixed-effect model
	Model 1	Model 2	Model 3	Model 4
Recent incarceration	-0.498 *** (0.071)	-0.417 *** (0.072)	-0.424 *** (0.083)	-0.070 (0.088)
Race				
White (reference)	---	---	---	---
Black	-0.270 * (0.106)	0.293 * (0.116)	-0.201 (0.154)	---
Hispanic	-0.086 (0.161)	-0.128 (0.128)	0.121 (0.190)	---
Other race	-0.193 (0.238)	-0.194 (0.211)	-0.199 (0.249)	---
Foreign-born	-0.260 (0.156)	-0.142 (0.143)	0.038 (0.233)	---
Age	0.012 ^ (0.006)	0.012 ^ (0.006)	0.007 (0.007)	0.052 (0.088)
Education				
Less than high school (reference)	---	---	---	---
High school diploma or GED	-0.063 (0.107)	-0.049 (0.102)	0.009 (0.111)	0.784 * (0.380)
More than high school	0.020 (0.132)	-0.012 (0.133)	0.176 (0.168)	0.526 ^ (0.290)
Number of children in household	0.054 ^ (0.031)	0.041 (0.029)	0.066 ^ (0.032)	0.068 * (0.032)
Multipartnered fertility	-0.330 *** (0.067)	-0.185 ** (0.061)	-0.033 (0.100)	-0.172 (0.176)
Importance of childrearing tasks	0.261 (0.245)	0.145 (0.225)	0.079 (0.362)	---
Beliefs about fatherhood	0.042 (0.098)	0.002 (0.087)	0.035 (0.099)	---
Relationship status with mother				
Nonresidential romantic relationship	---	---	---	---
Separated	-0.928 *** (0.149)	-0.547 *** (0.129)	-0.686 ** (0.170)	---
In a new relationship	-0.360 ** (0.096)	-0.255 * (0.092)	-0.259 * (0.108)	-0.167 * (0.084)
Relationship quality	0.065 ^ (0.032)	0.040 (0.031)	0.054 (0.042)	0.070 ^ (0.038)
Mother trusts father	0.852 *** (0.076)	0.315 ** (0.085)	0.439 ** (0.132)	0.964 *** (0.079)
Employed	-0.036 (0.115)	-0.040 (0.100)	-0.031 (0.117)	0.088 (0.079)
Income-to-poverty ratio	-0.019 (0.013)	-0.023 ^ (0.013)	-0.022 (0.016)	0.007 (0.017)
Material hardship	0.025 (0.029)	0.011 (0.026)	0.003 (0.035)	0.012 (0.022)
Depression	0.073 (0.106)	0.093 (0.098)	0.161 (0.139)	-0.039 (0.100)
Fair or poor health	-0.175 (0.137)	-0.219 (0.133)	-0.102 (0.159)	0.093 (0.117)

Impulsivity	-0.080 (0.055)	-0.102 [^] (0.055)	-0.102 (0.067)	---
Domestic violence	-0.022 (0.074)	0.012 (0.080)	-0.056 (0.094)	-0.074 (0.104)
Substance abuse	-0.050 (0.093)	-0.015 (0.091)	0.063 (0.103)	-0.195 [^] (0.104)
Prior incarceration	-0.092 (0.081)	-0.031 (0.071)	---	---
Child is male	0.120 [^] (0.069)	0.098 (0.066)	0.082 (0.072)	---
Child age in months	0.013 (0.019)	0.007 (0.016)	0.032 (0.019)	-0.010 (0.007)
Child temperament	-0.092 (0.063)	-0.096 (0.059)	-0.101 (0.073)	---
Lagged engagement		0.367 *** (0.026)	0.280 *** (0.042)	---
Constant	0.289	0.597	-0.957	-1.002
R-squared	0.256	0.341	0.318	0.126
N	1,673	1,673	1,022	1,673
Person-year observations	---	---	---	3,346

Note: All models include city fixed-effects. Robust standard errors in parentheses. [^] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Nonresidential fathers include all fathers not living with the mother and focal child at the three-year survey.

Table A4. Propensity Score Matching Models Predicting the Effect of Recent Paternal Incarceration on Change in Father's Parenting Between the Three- and Five-Year Surveys

Panel A. Residential Fathers^a

	Treatment N	Control N	Change in engagement	Change in shared responsibility in parenting	Change in cooperation in parenting	Change in parenting stress
Nearest neighbor	133	1,746	-1.131 *** (0.244)	-0.647 *** (0.135)	-0.260 ** (0.092)	-0.207 * (0.097)
Radius	133	1,746	-1.129 *** (0.232)	-0.671 *** (0.129)	-0.275 ** (0.087)	-0.148 (0.092)
Kernel	146	1,746	-1.153 *** (0.213)	-0.679 *** (0.122)	-0.321 *** (0.079)	-0.111 (0.085)

Panel B. Nonresidential Fathers

	Treatment N	Control N	Change in engagement	Change in shared responsibility in parenting	Change in cooperation in parenting	Change in parenting stress
Nearest neighbor	470	1,179	-0.213 ^ (0.121)	-0.129 * (0.065)	-0.185 * (0.075)	0.225 * (0.094)
Radius	470	1,179	-0.235 * (0.115)	-0.129 * (0.063)	-0.181 * (0.074)	0.219 * (0.092)
Kernel	494	1,179	-0.287 ** (0.107)	-0.141 * (0.060)	-0.161 * (0.070)	0.137 (0.084)

Note: Ns for parenting stress are smaller. For analyses of residential fathers, treatment N = 78, control N = 1,499 for nearest neighbor matching; treatment N = 78, control N = 1,499 for radius matching; treatment N = 91, control N = 1,499 for kernel matching. For analyses of nonresidential fathers, treatment N = 156, control N = 572 for nearest neighbor matching; treatment N = 156, control N = 572 for radius matching; treatment N = 170, control N = 572 for kernel matching. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Residential fathers include all fathers living with the mother and focal child at the three-year survey. Nonresidential fathers include all fathers not living with the mother and focal child at the three-year survey.

Table A5. Descriptive Statistics of Biological and Social Fathers' Parenting at Five-Year Survey, by Biological Father Recent Incarceration

	Biological father recently incarcerated		Biological father not recently incarcerated	
	Biological father	Social father	Biological father	Social father
Engagement	0.478	3.654 ***	1.046	3.670 ***
Shared responsibility in parenting	1.452	3.750 ***	1.674	3.583 ***
Cooperation in parenting	2.705	2.814	2.738	2.861
N	26	26	36	36

Note: Sample restricted to observations in which mothers are living with the child's biological father at the three-year survey, have broken up with the biological father at the five-year survey, and are living with a social father at the five-year survey. Asterisks for statistical significance compare biological father parenting and social father parenting when biological father did and did not experience recent incarceration. *** $p < 0.001$.