

Positive, Negative, or Null?

Countervailing Consequences of Paternal Incarceration for Parenting Quality \*

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## **ABSTRACT**

To date, research on the linkages between paternal incarceration and family life has taken two forms. On the one hand, quantitative research tends to consider effects on child wellbeing and generally concludes paternal incarceration harms children. Qualitative research, on the other hand, tends to consider how incarceration alters relationships between partners and suggests a nuanced combination of positive, negative, and null effects. In this paper, we attempt to rectify these seemingly disparate findings by considering the countervailing consequences of paternal incarceration for both fathers' and mothers' parenting. Using longitudinal data from the Fragile Families and Child Wellbeing Study and an exceptionally rigorous research design, we find that recent paternal incarceration sharply diminishes the quality of biological fathers' parenting, especially for residential fathers. Furthermore, virtually all of this association can be explained by changes in fathers' relationships with their children's mothers. Effects on mothers' parenting, however, are more inconsistent, as recent paternal incarceration is not consistently associated with any measure of maternal parenting across all modeling strategies. Our findings also show that recent paternal incarceration sharply increases the probability a mother will repartner, potentially offsetting some losses in the involvement of the biological father. Taken together, the collateral consequences of paternal incarceration for family life are complex and countervailing.

Considering only quantitative research on the effects of incarceration on adult men, it appears incarceration has myriad harmful consequences. 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).

Quantitative research on family life reports a similar tale for the partners and children left behind. For young children, paternal incarceration is associated with increases in mental health and behavioral problems (e.g., Geller, Garfinkel, and Western 2012; Wakefield and Wildeman 2011; Wildeman 2010), as well as a greater risk of experiencing severe hardships such as homelessness (Wildeman 2011). For adolescents and adults, the incarceration of a father is associated with more drug use (Roettger et al. 2010), higher rates of crime and arrest (Murray and Farrington 2005; Roettger and Swisher 2011), and worse educational outcomes (Foster and Hagan 2007, 2009). And this is to say nothing of how incarceration affects the mothers of these children, as research finds women attached to previously incarcerated men have a greater likelihood of mental health problems (Wildeman, Schnittker, and Turney forthcoming) and financial hardships (Schwartz-Soicher, Geller, and Garfinkel 2011) than their counterparts.

In an era where incarceration is both common and enormously unequally distributed, these quantitative findings suggest mass imprisonment may have substantial implications for racial and class inequality (Clear 2008; Pettit and Western 2004; Sampson and Loeffler 2010;

Wakefield and Uggen 2010; Western and Wildeman 2009). Yet qualitative research on the effects of incarceration presents a more nuanced picture, likely because it tends to consider consequences for multiple family members simultaneously. As with quantitative research, much qualitative research suggests incarceration damages family life. In one of the most vivid accounts, Nurse (2002:52-54) documents how incarceration socializes men to handle conflict rapidly and with extreme violence. Likewise, Braman (2004:198) describes how a romantic partner's incarceration can lead to crushing depression for the women left behind.

But unlike the majority of quantitative research, not all qualitative research points toward harmful effects of incarceration. For instance, 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. 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. Furthermore, although few respondents in any existing qualitative work directly discuss domestic violence, the incarceration of a romantic partner may curtail abuse for some women given high rates of domestic violence among ever-incarcerated men (Comfort 2008:162; Western 2006:159). Finally, incarceration could also have no discernible effect on family life and instead result from social selection processes (Giordano 2010:147-150; Johnson and Easterling 2012).

Existing research, thus, leaves us with a quandary. In the quantitative literature, most signs point toward incarceration harming family life. Yet qualitative research, which often focuses on 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. 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 how incarceration affects all those involved. In this study, we add greater texture and nuance to the quantitative research in this burgeoning research field by considering the consequences of paternal incarceration for one aspect of family life, fathers' and mothers' parenting quality, along with highlighting how paternal incarceration gives some women the opportunity to repartner.

The emphasis on parenting 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, Whitbeck, Beaman, and Conger 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 parenting quality (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 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 the quality of fathers' parenting but provide little to no hint about how it should affect mothers.

In considering how paternal incarceration is linked with parenting among fathers and mothers, 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 the effects of paternal incarceration on

fathers' and mothers' parenting. First, because they were collected to examine the capabilities of unmarried parents, parents whom 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 an array of parenting outcomes, making it possible to pay careful attention to the time-ordering of the dependent, explanatory, and control variables and employ rigorous modeling strategies that more closely estimate causal effects 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 high-quality data to consider how paternal incarceration shapes the parenting of both fathers and mothers, this study provides the first quantitative evidence of the ways in which the incarceration of a biological father could simultaneously enhance, inhibit, and have no effect on the parenting contexts of poor 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 (Clear 2008; Sampson and Loeffler 2010).

Until fairly recently, the high incarceration rates among poor, minority men were seen as problematic mostly to the degree that they exacerbated earnings inequality (e.g., Western 2002). Yet mass imprisonment may not be consequential solely for the men who churn through the criminal justice system. Indeed, a new wave of research suggests that it is also relevant for the social correlates of the incarcerated—the wives, girlfriends, parents, siblings, children, and friends who experience the cycle of incarceration 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 2009; Wildeman and Western 2010).

Research on the consequences of incarceration for family life arrives at a number of confounding conclusions, however. On the one hand, quantitative research, most of which considers 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), homelessness (Wildeman 2011), delinquency (Roettger and Swisher 2011), drug use (Roettger et al. 2011), obesity (Roettger and Boardman forthcoming) 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, nearly always suggesting harm (Schwartz-Soicher et al. 2011; Wildeman et al. forthcoming).

Qualitative research paints a sometimes dramatically disparate picture of how paternal incarceration affects family life, possibly because it more often considers effects on 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 strongly suggest null effects (Giordano 2010:147-150), and most also acknowledge that 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.

We contribute to this literature by considering how the incarceration of a father influences his parenting, the parenting of the mother of his child, and the chance the mother will repartner with a new man, 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 an exceptionally thorough assessment of the countervailing effects of incarceration on family life.

### **Effects of Paternal Incarceration on Fathers' Parenting**

A focus on the relationship between paternal incarceration and fathers' parenting is especially important since ethnographic and, to a lesser degree, quantitative 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 (e.g., Swisher and Waller 2008). Such effects are paradoxical since qualitative



research on nonresident (Edin, Nelson, and Paranal 2004) and juvenile fathers (Nurse 2002) who experience incarceration suggest time away from children often strongly 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), 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, paternal incarceration may diminish fathers' parenting quality 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 the 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, Remster, and King 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, it is likely that such resulting relationship instability is associated with fathers' parenting challenges.

Beyond changes in the relationship between mothers and fathers, a number of other 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. Fathers who are not financially contributing to children's wellbeing may limit their involvement, and fathers living apart from their children may be unable to afford transportation to visit. Indeed, economically marginalized fathers are less likely than their counterparts to engage in high-quality parenting (e.g., Nelson 2004).

Finally, the association between paternal incarceration and fathers' parenting may operate indirectly through fathers' health and wellbeing. The toll that 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; Schnittker, Massoglia, and Uggen forthcoming). Thus, these physical and mental health problems stemming from incarceration may mean that recently incarcerated fathers are less able than their counterparts to be active participants 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 effects of paternal incarceration on parenting to differ depending on fathers' pre-incarceration residential status. For one, although the little existing quantitative research suggests global negative effects on fathers' involvement (Geller and Garfinkel 2012; Swisher and Waller 2008; Waller and Swisher 2006), a close inspection of the qualitative literature shows that, in most instances when paternal incarceration diminished fathers' involvement, fathers were 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 that fathers' relationships with children's mothers links paternal incarceration with decreased involvement, effects will be concentrated among residential fathers.

Research on nonresidential fathers also suggests average negative effects, although the strongest evidence in this regard is restricted to juveniles (Nurse 2002). Indeed, of the other ethnographic research considering how paternal incarceration shapes parenting, all fathers with plummeting post-incarceration involvement were living with their children prior to incarceration (Braman 2004). Beyond the concentration of harm, of the few examples of fathers suggesting that their incarceration led to increased 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. Indeed, 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. Indeed, ever-incarcerated fathers are embedded in social networks comprised of, among others, current and former romantic partners, and there is mounting evidence that 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 worse mental health among mothers (Wildeman et al. forthcoming), 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. forthcoming) rather than their parenting. Therefore, it is difficult to know exactly what to expect with respect to parenting. And despite the negative consequences of paternal incarceration for women left behind, there are multiple reasons to expect mothers to hold their parenting quality constant. For one, a vast qualitative literature on the extensive familial and kin support in low-income black communities

(Aschenbrenner 1973; Hannerz 1969; 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. 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 even increase the quality of time spent with children.

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

Thus, prior empirical research on incarceration and family life suggests paternal incarceration is likely associated with substantial declines in fathers' parenting and effects on mothers' parenting are more uncertain. Indeed, based on extant research, it seems likely that paternal incarceration could have negative or positive effects on maternal parenting. In light of these expectations, 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 quality is unlikely offset by comparable improvements in mothers' parenting.

Yet for some of the 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 with new men (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 2010). It is not clear, though, as to whether these repartnerships would benefit children more broadly, as relationship instability is associated with negative outcomes for mothers (Cooper et al. 2009) and children (Cooper et al. 2011).

Despite the many reasons to expect that the incarceration of a biological father would increase the likelihood of the child having 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 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 consider how it affects the chance that a mother will repartner, expecting substantial effects.

### **Selection into Incarceration**

Despite these reasons to expect paternal incarceration to compromise the parenting of biological fathers, positively or negatively affect the parenting of biological mothers, and increase the likelihood mothers find new romantic partners who are more engaged fathers, it may also be the case that any relationships detected here result from social selection processes. For instance, biological fathers who experience incarceration are almost certainly less likely to be involved with their children than other fathers, on average, given the many obstacles they face to effective parenting. Likewise, women who have 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 children's 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 section suggest that absent a dataset that allows us to adjust for extensive time-varying and fixed covariates, it is difficult to believe that any relationship shown here – whether positive, negative, or null – is real absent extensive controls for both observed and unobserved characteristics.

## **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 of 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 that the transition to school is a critical period in the life course (Entwisle and Alexander 1989). An additional advantage to examining parenting at the five-year survey is that it allows us to examine changes in parenting over a short time span (between the three- and five-year surveys).

The analytic sample comprises 3,571 families of the 4,898 families in the baseline sample.<sup>1</sup> 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

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<sup>1</sup> 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 with respect to all other parenting outcomes are robust to dropping observations in which the father did not participate in the five-year survey.

we excluded an additional 276 observations missing data on any of our outcome variables. 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). There are some differences between the full and analytic samples, with the analytic sample generally being more advantaged than the full sample.

## Measures

**Dependent variables.** Our key outcome variables include measures of fathers' and mothers' parenting at the five-year survey. We examine five distinct indicators of fathers' parenting: engagement, shared responsibility in parenting, cooperation in parenting, discipline, 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), we present results using mother reports of fathers' outcomes (with the exception of parenting stress, which was only reported by the father).<sup>2</sup> 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 is an average of responses to these questions. 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

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<sup>2</sup> Both mothers and fathers reported on fathers' engagement and discipline with the focal child. The correlation between mothers' and fathers' reports was .55 for engagement and .37 for discipline. Supplemental analyses (described below) show the findings are robust to using father-reported outcomes.



makes for the child (1 = *never* to 4 = *always*).<sup>3</sup> Discipline is a dummy variable indicating the father spanked the child in the past month. 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 three parallel indicators of maternal parenting: engagement, discipline, and parenting stress.<sup>4</sup> In some multivariate models, we adjust for parenting at the three-year survey.<sup>5</sup> See the appendix for a detailed description of all variables.

**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. All of our multivariate analyses control for prior incarceration, a dummy variable indicating the father was ever incarcerated at or before the three-year survey (including prior to the birth of the focal child) and helps adjust for selection into recent incarceration. Both measures of incarceration provide useful information on their own, but they are not mutually exclusive and the distinction between them allows for a rigorous analytic strategy. For both recent and prior incarceration, we rely on maternal and paternal reports of incarceration, and assume the father was incarcerated if either report is affirmative.<sup>6</sup>

**Control variables.** Our multivariate analyses adjust for a host of individual-level characteristics that may render the association between paternal incarceration and parenting spurious. All control variables are measured at or before the three-year survey and, thus, prior to recent incarceration. We control for race, immigrant status, age, education, number of children,

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<sup>3</sup> Fathers who did not see their child in the past month are coded as 0 (engagement) or 1 (shared responsibility in parenting and cooperation in parenting).

<sup>4</sup> 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.

<sup>5</sup> 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.

<sup>6</sup> Robustness checks in which paternal incarceration is coded differently provides substantively similar results.

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 three paternal characteristics repeatedly linked to incarceration: impulsivity (Dickman 1990), domestic violence, and drug or alcohol use. Finally, the multivariate analyses control for three child characteristics (gender, age, and temperament). See the Appendix for detail on coding.

**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 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.<sup>7</sup> 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**

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<sup>7</sup> 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. Unfortunately, this question was not asked prior to the five-year survey so measuring change is not possible.

The analyses proceed in four parts: (1) examining the association between recent paternal incarceration and fathers' parenting; (2) examining the association between recent paternal incarceration and mothers' parenting; (3) examining the mechanisms underlying the association between recent paternal incarceration and fathers' parenting; and (4) examining 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 incarceration: (1) ordinary least squared (OLS) regression models or logistic 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 effects of incarceration on parenting. Because residential and nonresidential fathers parent across vastly different contexts, we present analyses separately for residential and nonresidential parents at the three-year survey (thus, prior to recent incarceration). To keep this and subsequent tables parsimonious, we present only the point estimates for recent paternal incarceration.<sup>8</sup>

In estimating fathers' parenting, we include recent and prior incarceration in the first and subsequent models. Model 2 adjusts for a wide array of control variables that precede recent incarceration (see table note for details). Model 3 includes all of these controls and 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 prior to incarceration. In Model 4, we restrict the sample to fathers with prior incarceration (incarceration at or prior to the three-year survey). By examining only those who experienced prior incarceration (Model 4), we restrict the sample to a group of fathers at risk of incarceration and, thus, diminish unobserved

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<sup>8</sup> See Appendix Tables A and B for full models that estimate paternal engagement, and full tables of other outcomes are available upon request from the authors.

heterogeneity and strengthening causal inference (LaLonde 1986; Leamer 1983). These and all multivariate models include city fixed-effects because observations were clustered in 20 cities.

Then, we take two additional steps to diminish unobserved heterogeneity. In Model 5, we present fixed-effects models that estimate the association between recent paternal incarceration and fathers' parenting. In this model, we consider how incarceration between the three- and five-year surveys is linked to changes in parenting during this same time period, net of unobserved stable characteristics and observed time-varying characteristics. Finally, in Model 6, we present results from propensity score matching models that estimate *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). Propensity score matching 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.<sup>9</sup>

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<sup>9</sup> We include all control variables included in the OLS regression models when generating the propensity score. 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, which means that 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 described above in Appendix Table C.

**Recent paternal incarceration and mothers' parenting.** In the second analytic stage, we turn to the association between recent paternal incarceration and mothers' parenting (Table 4). We again use OLS or logistic 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.

**Explaining the association between recent paternal incarceration and fathers' parenting.** In the third analytic stage, we turn to explaining the relationship between recent paternal incarceration and fathers' parenting (Table 5). We use the full samples of residential and nonresidential fathers. All models include the full set of control variables included in Model 3 of Tables 3 and 4 (including the lagged dependent variable). 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 the biological fathers' recent incarceration. We consider the probability of *separating from the father and remaining single* versus staying with the father, as well as the probability of *separating from the father and repartnering* versus staying with the father. These analyses are restricted to mothers coresidential with the biological father at the

three-year survey. The first and all subsequent models include recent and prior incarceration. Model 2 adjusts for all control variables included in previous models. The final model restricts the sample to women attached to previously incarcerated biological fathers.

### **Sample Description**

In Table 1, we present descriptive statistics of all variables, by parents' residential status. Consistent with expectations, parenting varies by residential status. For example, residential fathers spend an average of 3.2 days per week engaged with their five-year-old children, while nonresidential fathers spend an average of 1.0 day with their children ( $p < .001$ ). Compared to nonresidential fathers, residential fathers have greater shared responsibility in parenting ( $p < .001$ ) and cooperation in parenting ( $p < .001$ ). They are less likely to spank their child ( $p < .001$ ) and report slightly less parenting stress ( $p < .10$ ). 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. Fully 26% of residential and 61% of nonresidential fathers experienced incarceration at or before the three-year survey.

[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. To begin with, 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 doing activities with their children ( $p < .001$ ). 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,  $p < .10$ ). But recently incarcerated residential fathers are less likely to spank their children. Only 19% of recently incarcerated residential fathers spanked their child in the past month, compared to 28% of not recently incarcerated residential fathers ( $p < .05$ ). The 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, are 15 percentage points more likely to spank their child in the past month ( $p < .001$ ) and report more parenting stress ( $p < .001$ ). These patterns persist for nonresidential mothers. With respect to mothers' engagement, though, there are no descriptive differences for either residential or nonresidential parents. Thus, even before adjusting for a single covariate, the association between recent paternal incarceration and maternal parenting is nearly nonexistent and statistically insignificant.

### **Estimating Fathers' Parenting as a Function of Recent Paternal Incarceration**

**Residential parents.** The descriptive differences in fathers' parenting by recent paternal incarceration status are substantial, though it is possible these differences are spurious and instead result from other characteristics associated with both incarceration and parenting. Thus, in Table 3, we present multivariate results that estimate fathers' parenting as a function of recent paternal incarceration. We turn first to fathers residential at the three-year survey (Panel A). Each row represents a different regression model and the coefficients shown are for recent paternal incarceration. In Model 1 estimating fathers' engagement, which adjusts only for prior incarceration, recent paternal incarceration is associated with about 1.5 fewer days of engagement ( $p < .001$ ). Prior paternal incarceration (coefficient not shown) is not associated with less engagement ( $-.091, n.s.$ ). When we adjust for a host of characteristics associated with incarceration and parenting (Model 2,  $-1.328, p < .001$ ), including the lagged dependent variable (Model 3,  $-1.262, p < .000$ ), the size of the recent incarceration coefficient decreases slightly and remains statistically significant. In Model 4, which includes all covariates from Model 3 but restricts the sample to previously incarcerated fathers, we find recent paternal incarceration is associated with about one fewer day of engagement ( $-.996, p < .001$ ).

In the remaining models, we use two additional modeling strategies – fixed-effects and propensity score models – to triangulate our findings. Both corroborate our finding that recent incarceration is associated with less engagement among residential fathers. The coefficient from the fixed-effects model (Model 5) is smaller in magnitude than coefficients from the OLS models, 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 ( $-.725, p < .001$ ). Results from propensity score



models (Model 6) 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 ( $-.955, p < .001$ ). The individual characteristics we adjust for in Model 2 explain 15% of this relationship, and the lagged dependent variable we adjust for in Model 3 explains an additional 6% of this relationship, but recent paternal incarceration is still negatively associated with shared responsibility in parenting ( $-.763, p < .001$ ). This relationship persists in Model 4, when we limit the sample to previously incarcerated fathers ( $-.629, p < .001$ ). Coefficients from fixed-effects and propensity score models are slightly smaller in magnitude than coefficients from OLS models, but these alternative modeling strategies lend further confidence in our findings. The coefficients from the fixed-effects model (Model 5) and the propensity score model (Model 6), respectively, translate into nearly half of a standard deviation ( $-.404, p < .001$ ) and more than three-quarters of a standard deviation ( $-.679, p < .001$ ).

The next series of models, which estimate residential fathers' cooperation in parenting, are consistent with estimates of fathers' shared responsibility in parenting. 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 that limits the sample to previously incarcerated fathers ( $-.306, p < .01$ ). Again, these findings persist across different modeling strategies. The coefficient from the fixed-effects model (Model 5) translates into nearly one-third of a standard deviation ( $-.183, p < .001$ ),

and the coefficient from the propensity score model (Model 6) translates into more than half of a standard deviation ( $-.321, p < .001$ ).

Spanking and parenting stress comprise our final two outcomes. The descriptive statistics presented in Table 2 suggest recently incarcerated fathers are less likely to spank their children than their counterparts, and this association persists in the logistic regression models (Models 1 through 4). According to the most conservative logistic regression model, Model 4, recently incarcerated fathers are less likely to spank their child in the past month ( $-.598, p < .05$ ). The association between recent incarceration and spanking falls to marginal statistical significance in the fixed-effect model (Model 5) but remains statistically significant in the propensity score model (Model 6) ( $-.163, p < .01$ ).

With respect to parenting stress, the OLS regression models (Models 1 through 4) and the propensity score model (Model 6) show no statistically significant association between recent incarceration and fathers' parenting stress. The fixed-effect model (Model 5) suggests that recently incarcerated fathers, net of unobserved time-invariant characteristics and observed time-varying characteristics, have less parenting stress given their fixed traits ( $-.146, p < .05$ ).<sup>10</sup>

**Nonresidential parents.** We next turn to fathers nonresidential at the three-year survey (Panel B). For the first outcome, paternal engagement, the OLS models show that recent paternal incarceration is associated with less engagement. According to the most conservative OLS model, Model 4, recently incarcerated fathers engage with their children nearly one-half of a day

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<sup>10</sup> 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 paternal incarceration and race/ethnicity, between paternal incarceration and domestic violence, and between paternal incarceration and incarceration history (father incarcerated previously). We found no evidence that the effects of incarceration on fathers' parenting vary by race/ethnicity or domestic violence, and limited evidence that the effects of incarceration vary by incarceration history. For residential fathers, the effects of incarceration on engagement are stronger for fathers experiencing incarceration for the first time.

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 5 ( $-.070$ , *n.s.*), suggesting much – indeed, nearly all – of the association between recent paternal incarceration and engagement among nonresidential fathers is due to unobserved time-invariant characteristics. The coefficient from the propensity score model (Model 6) is smaller in magnitude than the OLS models and larger in magnitude than the fixed-effects model.

The next two outcomes, shared responsibility in parenting and cooperation in parenting among nonresidential fathers, show results similar to those of engagement among nonresidential fathers. Recent paternal incarceration is associated with less shared responsibility in parenting and cooperation in parenting in the OLS models (Models 1 through 4) and in the propensity score model (Model 6), but the association falls to statistical insignificance in the fixed-effects model (Model 5). With respect to the final two outcomes, all models show no association between recent incarceration and spanking or parenting stress among nonresidential fathers.

Taken together, compared to the findings for residential fathers, the findings for nonresidential fathers are less consistent and smaller in magnitude. Post-hoc tests of equality lend confidence to this interpretation. Across nearly all models 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.<sup>11</sup>

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<sup>11</sup> We consider the robustness of our results with two alternative modeling strategies. In the first alternative specification, 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 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 in magnitude, findings (available upon request). For example, in the most conservative OLS model estimating engagement among residential fathers (Model 4 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

## Estimating Mothers' Parenting as a Function of Recent Paternal Incarceration

**Residential parents.** We examine the effects of recent paternal incarceration on 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 five OLS models or the propensity score model. However, in the fixed-effect model (Model 5) that accounts for time-invariant unobserved characteristics and time-varying observed characteristics, 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 buttresses our case that recent paternal incarceration either has no effect on the quality of maternal parenting or actually improves it in discernible ways.

[Table 4 about here.]

We next estimate mothers' spanking as a function of recent paternal incarceration among residential mothers. Model 1, which only adjusts for prior paternal incarceration, shows mothers attached to recently incarcerated fathers, compared to their counterparts, have 1.35 times the

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responsibility in parenting and -.260 (compared to -.306) for cooperation in parenting. In the most conservative OLS model estimating engagement among nonresidential fathers (Model 4 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. The one exception to this overall consistent pattern is for the spanking outcome. When restricting the sample to fathers who were nonresidential at the three-year survey and saw their child in the past 30 days at the five-year survey, there is no statistically significant association between recent incarceration and spanking. Thus, the results shown above – that recently incarcerated fathers engage in less spanking than their counterparts – are driven by the fact that these fathers are simply less likely to see their children and, thus, do not have an opportunity to spank them. In the second alternative specification, we replace mothers' reports with fathers' reports when possible (available upon request). For both outcomes that have both mothers' and fathers' reports, engagement and spanking, findings are robust to using fathers' reports. Supplemental analyses show that, in the most conservative OLS model for residential fathers (Model 4 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). Taken together, though, these robustness checks suggest that (1) recent paternal incarceration is associated with impairments in fathers' parenting net of these fathers simply not seeing their children and (2) the findings are not driven by mothers' reporting bias.

odds of spanking their children ( $p < .01$ ). This association, however, falls from statistical significance in the remaining logistic regression models (Models 2 through 4), in the fixed-effect model (Model 5), and in the propensity score model (Model 6). With respect to parenting stress, the first four models suggest that recent paternal incarceration is associated with more parenting stress among mothers and fathers living together at the three-year survey. The fixed-effect model (Model 5) and the propensity score model (Model 6) show no association between recent incarceration and parenting. Given the relatively small magnitude of the OLS coefficients (Model 4 translates to one-fifth of a standard deviation) and the statistical insignificance of the alternative modeling strategies, we conclude that the association between recent paternal incarceration and maternal parenting stress is not robust.

**Nonresidential parents.** We next consider the association between recent paternal incarceration and mothers' parenting among nonresidential mothers (Panel B). Across nearly all outcomes and models, we find no association between recent paternal incarceration and mothers' parenting. One exception persists: Model 1 predicting spanking suggests mothers attached to recently incarcerated men have a greater likelihood of spanking the child in the past month (.256,  $p < .05$ ). But this association falls to statistical insignificance once control variables are added.

### **Explaining the Recent Paternal Incarceration-Fathers' Parenting Relationship**

Taken together, the results presented above suggest that recent paternal incarceration is robustly associated with fathers' engagement, shared responsibility in parenting, and cooperation in parenting, especially among residential fathers. In the next stage of analysis, we attempt to explain the relationship between recent paternal incarceration and these three aspects of fathers' parenting, focusing on three sets of possible explanations: change in parents' relationship,

change in fathers' economic wellbeing, and change in fathers' health. In Table 5, as in the prior multivariate tables, each row represents a separate regression model and we present only the coefficients for recent incarceration. The first model, which is the equivalent of Model 3 from Table 3, provides a baseline estimate for the subsequent models.

[Table 5 about here.]

**Residential parents.** We turn first to estimates of engagement among fathers living with the child's mother at the three-year survey (Panel A). 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 that 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 much 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 fathers residential at the three-year survey ( $-.390, p < .05$ ), suggesting some direct effects.

We next turn to explaining the effect of recent paternal incarceration on 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 effect of recent incarceration to statistical insignificance ( $.024, n.s.$ ). Taken together, these findings suggest that much of the negative effects of incarceration on father's parenting results from changes in his relationship with children's mothers and that this is the sole mediator that receives support.<sup>12</sup>

**Nonresidential parents.** We next turn to estimates of engagement among fathers not living with the child's mother at the three-year survey. The first row examines father engagement. In Model 2, we find that changes in the parents' relationship explain about 45% of the association between recent paternal incarceration engagement. Though changes in the parents' relationship explain less of the association for nonresidential fathers than residential fathers, the change from Model 1 to Model 2 is still substantial. Similar to the estimates for residential fathers, changes in relationship status and changes in mothers' trust in the father explain the largest percentage of the association (28% and 19%, respectively, compared to 0%

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<sup>12</sup> When we restrict the sample to residential fathers previously incarcerated (results not presented), we find that changes in the fathers' relationship with children's mothers explains 80% of the recent incarceration effect on engagement, 88% of the effect on shared responsibility in parenting, and 90% of the effect on cooperation in parenting.

for mothers' refusal to let father see the child and 8% for changes in relationship quality). Also similar to the estimates for residential fathers, changes in economic wellbeing and changes in health do little to attenuate the association between recent paternal incarceration and engagement. The effect of recent incarceration on shared responsibility in parenting and cooperation in parenting works in a similar way. Changes in the parents' relationship explain the lion's share of the associations – 68% for shared responsibility in parenting and 71% for cooperation in parenting – while changes in economic wellbeing and health play a small role.<sup>13</sup>

### **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 incarcerated for the first time, and also show much of the effects on 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. In Table 6, we present results from multinomial logistic regression models estimating mothers' relationship status at the five-year survey as a function of recent incarceration, among mothers coresidential 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 the first model, which adjusts only for prior incarceration, we find recent incarceration is associated with a greater likelihood of separating from the father and remaining single ( $OR = 5.71, p < .001$ ). This

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<sup>13</sup> The above analyses use mothers' reports of fathers' parenting. It is possible that a mother experiencing a substantial change in her relationship with the father are simply more likely to report lower father engagement, regardless of the father's 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.



relationship persists when adjusting for a wide array of control variables (Model 2) and when restricting the sample to mothers attached to previously incarcerated fathers (Model 3). The coefficient from the most conservative model, Model 3, shows that mothers attached to recently incarcerated fathers have 3.42 times the odds of breaking up with the father and remaining single, compared to staying with the father ( $p < .001$ ).

[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 greater likelihood of breaking up with the father and repartnering, and this association persists across all three models. In the most conservative model, Model 3, the coefficient shows that mothers attached to recently incarcerated men have 7.63 times the odds of separating from the father and repartnering ( $p < .001$ ). In this most conservative model, the coefficients for remaining single and for repartnering are marginally different from one another, in that mothers attached to recently incarcerated men are more likely to repartner than to remain single ( $p < .10$ ).

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 Appendix D, we present descriptive statistics of biological father and social father parenting at the five-year survey, by biological fathers' recent incarceration status.<sup>14</sup> We turn first to

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<sup>14</sup> We caution readers from putting too much emphasis on these findings due to the limited, nonrandom sample. The sample is restricted to mothers who meet the following criteria: (1) are living with the biological father at the three-year survey; (2) have separated from the biological father by the five-year survey; and (3) are living with a new partner at the five-year survey (as most questions about social fathers' parenting were only asked of mothers living with the social father). Thus, these analyses comprise 62 mothers (26 attached to a recently incarcerated biological father and 36 attached to a not recently incarcerated biological father).

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 and are equally likely to spank the focal child. 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.

## **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 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 remarkably suited to examining the effects of incarceration on family life. We also use an exceptionally 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 has no effect on family functioning.

We come to five conclusions about the effects of recent paternal incarceration on parenting. First, we find that paternal incarceration is robustly associated with fathers' engagement, shared responsibility in parenting, and cooperation in parenting but not their discipline or 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 discipline or parenting stress. Recently incarcerated fathers are less likely to spank their children, but only because they are less likely to see their children after incarceration (Swisher and Waller 2008). 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 this finding, though, as we feel most confident in results that stand up to all modeling strategies. Taken together, the null effects for discipline and parenting stress are in some ways consistent with the negative effects for other measures of parenting.

Second, we find the associations between recent paternal incarceration and parenting are especially 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, with changes in fathers' economic wellbeing and changes in fathers' health contributing virtually nothing to this association. Changes in the parents' relationship, among parents residential prior to incarceration, explain 71% of the effect of incarceration on engagement, 80% on shared responsibility in parenting, and 93% on cooperation in parenting. And changes in parents' relationships also explain the lion's share of the incarceration effect among nonresidential parents (45%, 68%, and 71% of the effect on engagement, shared responsibility in parenting, and cooperation in parenting, respectively). 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).

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. forthcoming), 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 effects, 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. 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. forthcoming). 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 and cannot accurately estimate its effects. We also do not have reliable measures of incarceration duration, though it may be possible that shorter stints in prison or jail may have less of an effect on parenting than longer stints. Other features of the incarceration experience – such as experiences surrounding the arrest, visitation from family members, or distance incarcerated from family – remain unmeasured. These factors may help explain some of the inconsistencies between the various modeling strategies.

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 the potential feedback loops between biological fathers' parenting, mothers' parenting, and social fathers' parenting. For example, it is possible that increases in involvement among social fathers – and the mere presence of social father – may influence the level of engagement of biological fathers (Nurse 2002:115). 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 only a minimal effect on one family member, severe negative consequences for another, and moderately positive consequences for a final family member. 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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## APPENDIX

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PARENTING	
Engagement ( $\alpha = .94$ for fathers, $\alpha = .69$ for mothers)	0 = 0 days per week to 7 = 7 days per week 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 that 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 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 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
Discipline	1 = spanked child in past month, 0 = did not spank child in past month
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
CONTROL VARIABLES	
Race/ethnicity	Series of mutually exclusive variables indicating respondent's

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	race/ethnicity: non-Hispanic white (reference category), non-Hispanic Black, Hispanic, non-Hispanic other race
Immigrant status	Dummy variable indicating respondent born outside of United States
Age	Continuous variable
Education	Series of mutually exclusive variables indicating respondent's educational attainment: less than high school degree (reference category), 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	Series of mutually exclusive variables indicating respondent's relationship with child's other biological parent: married (reference category), 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> <sup>a</sup>
Mother trusts father	Dummy variable indicating mother trusts the father to take care of the child for one week <sup>b</sup>
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 father hit, slapped, or kicked the mother
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
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

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

<sup>b</sup> 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 1. Descriptive Statistics of All Variables Included in Analyses**

	Fathers				Mothers			
	Residential <sup>a</sup>		Non-residential		Residential		Non-residential	
	Mean or %	S.D.	Mean or %	S.D.	Mean or %	S.D.	Mean or %	S.D.
<i>Parenting</i>								
Engagement (y3)	4.020	(1.260)	1.183	(1.689)	4.996	(0.884)	4.980	(0.941)
Engagement (y5)	3.223	(1.667)	1.033	(1.645)	4.634	(1.161)	4.665	(1.165)
Shared responsibility in parenting (y3)	3.461	(0.547)	1.777	(0.999)	---		---	
Shared responsibility in parenting (y5)	3.247	(0.876)	1.695	(0.989)	---		---	
Cooperation in parenting (y3)	3.780	(0.312)	2.546	(1.140)	---		---	
Cooperation in parenting (y5)	3.648	(0.598)	2.445	(1.185)	---		---	
Spanked child in past month (y3)	36.5%		9.0%		51.8%		53.4%	
Spanked child in past month (y5)	27.1%		8.4%		44.8%		49.1%	
Parenting stress (y3)	2.064	(0.676)	2.147	(0.705)	2.211	(0.645)	2.295	(0.696)
Parenting stress (y5)	2.013	(0.686)	2.059	(0.737)	2.138	(0.656)	2.230	(0.710)
<i>Paternal incarceration</i>								
Recent incarceration (y5) <sup>b</sup>	7.8%		29.6%		---		---	
Prior incarceration (b, y1, y3) <sup>c</sup>	26.4%		60.6%		---		---	
<i>Control variables</i>								
<i>Race (b)</i>								
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)
<i>Education (y3)</i>								
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 (b)	2.948	(0.130)	2.942	(0.145)	---		---	
Beliefs about fatherhood (b)	3.758	(0.404)	3.638	(0.480)	---		---	
<i>Relationship status (y3)</i>								
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)	---		---	
Mother report of domestic violence (y3)	---		---		1.4%		14.9%	
Mother report father abuses substances (y3)	---		---		3.3%		18.1%	
Child is male (b)	---		---		51.5%		52.3%	
Age of child in months (b)	---		---		61.587	(2.824)	61.755	(0.499)
Child temperament (y1)	3.334	(0.735)	3.146	(0.766)	3.462	(0.743)	3.330	0.768
<i>Potential 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)	-0.071	(0.371)	-0.010	(0.502)
<i>Relationship status (y5)</i>								
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 1-year survey; y3: measured at 3-year survey; y5: measured at 5-year survey. With the exception of father's parenting stress, all parenting variables are reported by mothers. N is for all variables except father's parenting stress. The N for father's parenting stress is 1,592 for residential fathers and 742 for nonresidential fathers.

<sup>a</sup> Residential includes all parents living together at the 3-year survey. Nonresidential includes all parents not living together at the 3-year survey.

<sup>b</sup> Recent incarceration includes any paternal incarceration taking place after the 3-year survey and up to and including the 5-year survey.

<sup>c</sup> Prior incarceration includes any paternal incarceration taking place up to and including the 3-year survey.

**Table 2. Descriptive Statistics of Fathers' and Mothers' Parenting at 5-Year Survey, by Recent Paternal Incarceration**

**Panel A. Residential Parents<sup>a</sup>**

	Fathers		Mothers	
	Recent	No recent	Recent	No recent
	incarceration <sup>b</sup>	incarceration	incarceration	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 ***	---	---
Spanked child in past month	18.9%	27.8% *	58.8%	43.6% ***
Parenting stress	2.120	2.006 ^	2.261	2.127 ***
N	148	1,746	148	1,746

**Panel B. Nonresidential Parents**

	Fathers		Mothers	
	Recent	No recent	Recent	No recent
	incarceration	incarceration	incarceration	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 ***	---	---
Spanked child in past month	6.8%	9.1%	54.7%	46.7% **
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. ^  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

<sup>a</sup> Residential parents includes all parents living together at the 3-year survey. Nonresidential parents includes all parents not living together at the 3-year survey.

<sup>b</sup> Recent incarceration includes any paternal incarceration taking place after the 3-year survey and up to and including the 5-year survey.

**Table 3. Regression Models Estimating Fathers' Parenting at 5-Year Survey as a Function of Recent Paternal Incarceration**

**Panel A. Residential Parents<sup>a</sup>**

	OLS or logit models				Fixed-effect models	Propensity score models
	Model 1 + <i>prior</i> <i>incarceration</i>	Model 2 + <i>controls</i>	Model 3 + <i>lagged DV</i>	Model 4 <i>Previously</i> <i>incarcerated</i>	Model 5 + <i>controls</i>	Model 6 <i>Kernel matching</i>
Engagement	-1.467 *** (0.171)	-1.328 *** (0.177)	-1.262 *** (0.182)	-0.996 *** (0.230)	-0.725 *** (0.130)	-1.153 *** (0.213)
Shared responsibility in parenting	-0.955 *** (0.095)	-0.812 *** (0.109)	-0.763 *** (0.116)	-0.629 *** (0.139)	-0.404 *** (0.065)	-0.679 *** (0.122)
Cooperation in parenting	-0.500 *** (0.068)	-0.401 *** (0.073)	-0.370 *** (0.076)	-0.306 ** (0.095)	-0.183 *** (0.050)	-0.321 *** (0.079)
Spanked child in past month	-0.564 *** (0.153)	-0.773 *** (0.200)	-0.977 *** (0.223)	-0.598 * (0.305)	-0.862 ^ (0.464)	-0.163 ** (0.051)
Parenting stress	0.030 (0.061)	-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	1,894	500	1,894	1,894
Person-year observations	---	---	---	---	3,788	---

**Panel B. Nonresidential Parents**

	OLS or logit models				Fixed-effect models	Propensity score models
	Model 1 + <i>prior</i> <i>incarceration</i>	Model 2 + <i>controls</i>	Model 3 + <i>lagged DV</i>	Model 4 <i>Previously</i> <i>incarcerated</i>	Model 5 + <i>controls</i>	Model 6 <i>Kernel matching</i>
Engagement	-0.527 *** (0.064)	-0.498 *** (0.071)	-0.417 *** (0.072)	-0.424 *** (0.083)	-0.070 (0.088)	-0.287 ** (0.107)
Shared responsibility in parenting	-0.247 *** (0.037)	-0.215 *** (0.042)	-0.179 ** (0.043)	-0.181 ** (0.047)	-0.018 (0.045)	-0.141 * (0.060)
Cooperation in parenting	-0.314 *** (0.062)	-0.260 *** (0.060)	-0.191 ** (0.065)	-0.198 * (0.069)	-0.081 (0.060)	-0.161 * (0.070)
Spanked child in past month	-0.419 (0.263)	-0.412 (0.293)	-0.337 (0.299)	-0.425 (0.294)	0.756 (0.474)	0.008 (0.021)
Parenting stress	0.133 (0.103)	0.106 (0.098)	0.081 (0.090)	0.058 (0.085)	0.024 (0.085)	-0.127 (0.084)
N <sup>b</sup>	1,673	1,673	1,673	1,022	1,673	1,673
Person-year observations	---	---	---	---	3,346	---

Note: Ordinary least squared (OLS) regression models estimate engagement, shared responsibility in parenting, cooperation in parenting, and parenting stress. Logistic regression models estimate spanking in the past month. Coefficients for recent incarceration shown. All models include city fixed-effects. Standard errors in parentheses. Model 1 controls for prior incarceration. Model 2 adjusts for the following paternal characteristics (unless otherwise noted): prior incarceration, 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), child gender (reported by mother), child age (reported by mother), and child temperament. Model 3 includes all variables from Model 2 and a lagged dependent variable. Model 4 includes all variables from Model 3 and restricts the sample to fathers previously incarcerated. Model 5 includes all time-invariant and time-varying controls from Model 3. ^  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

<sup>a</sup> Residential parents includes all parents living together at the 3-year survey. Nonresidential parents includes all parents not living together at the 3-year survey.

<sup>b</sup> For residential parents, Ns for parenting stress include 1,592 (Models 1 through 3) and 396 (Model 4). For nonresidential parents, Ns for parenting stress include 742 (Models 1 through 3) and 420 (Model 4).

**Table 4. Regression Models Estimating Mothers' Parenting at 5-Year Survey as a Function of Recent Paternal Incarceration**

**Panel A. Residential Parents<sup>a</sup>**

	OLS or logit models				Fixed-effect models	Propensity score models
	Model 1 + <i>prior</i> <i>incarceration</i>	Model 2 + <i>controls</i>	Model 3 + <i>lagged DV</i>	Model 4 <i>Previously</i> <i>incarcerated</i>	Model 5 + <i>controls</i>	Model 6 <i>Kernel matching</i>
Engagement	-0.029 (0.136)	0.029 (0.136)	0.127 (0.108)	0.016 (0.094)	0.279 ** (0.092)	0.163 (0.112)
Spanked child in past month	0.409 * (0.174)	0.168 (0.193)	0.151 (0.198)	0.344 (0.236)	0.185 (0.359)	0.023 (0.051)
Parenting stress	0.144 ** (0.046)	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	1,894	500	1,894	1,894
Person-year observations	---	---	---	---	3,788	---

**Panel B. Nonresidential Parents**

	OLS or logit models				Fixed-effect models	Propensity score models
	Model 1 + <i>prior</i> <i>incarceration</i>	Model 2 + <i>controls</i>	Model 3 + <i>lagged DV</i>	Model 4 <i>Previously</i> <i>incarcerated</i>	Model 5 + <i>controls</i>	Model 6 <i>Kernel matching</i>
Engagement	-0.006 (0.064)	-0.004 (0.062)	0.020 (0.058)	-0.019 (0.065)	0.068 (0.068)	-0.025 (0.071)
Spanked child in past month	0.256 * (0.127)	0.189 (0.134)	0.137 (0.160)	0.170 (0.164)	0.063 (0.227)	-0.007 (0.033)
Parenting stress	0.057 (0.035)	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	1,673	1,022	1,673	1,673
Person-year observations	---	---	---	---	3,346	---

Note: Ordinary least squared (OLS) regression models estimate engagement and parenting stress. Logistic regression models estimates spanking in the past month. Coefficients for recent incarceration shown. All models include city fixed-effects. Robust standard errors in parentheses. Model 1 controls for prior incarceration. Model 2 adjusts for the following maternal characteristics (unless otherwise noted): prior incarceration, 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, father engaged in domestic violence, father abused substances, child gender, child age, and child temperament. Model 3 includes all variables from Model 2 and a lagged dependent variable. Model 4 includes all variables from Model 3 and restricts the sample to fathers previously incarcerated. Model 5 includes all time-invariant and time-varying controls from Model 3. \*  $p < 0.05$ , \*\*  $p < 0.01$ .

<sup>a</sup> Residential parents includes all parents living together at the 3-year survey. Nonresidential parents includes all parents not living together at the 3-year survey.

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

**Panel A. Residential Parents<sup>a</sup>**

	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

**Panel B. Nonresidential Parents**

	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	-0.417 *** (0.072)	-0.230 *** (0.054)	-0.398 *** (0.073)	-0.408 *** (0.072)	-0.228 *** (0.054)
Shared responsibility in parenting	-0.179 ** (0.043)	-0.058 (0.041)	-0.167 ** (0.043)	-0.171 ** (0.042)	-0.056 (0.040)
Cooperation in parenting	-0.191 ** (0.065)	-0.055 (0.036)	-0.188 * (0.067)	-0.183 * (0.064)	-0.057 (0.042)
N	1,673	1,673	1,673	1,673	1,673

Note: Coefficients for recent incarceration shown. All models include city fixed-effects. Robust standard errors in parentheses. Model 1 includes all covariates from Model 3 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. ^  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

<sup>a</sup> Residential parents includes all parents living together at the 3-year survey. Nonresidential parents includes all parents not living together at the 3-year survey.

**Table 6. Multinomial Logistic Regression Models Estimating Mothers' Relationship Status with Father at 5-Year Survey by Recent Paternal Incarceration, Conditional on Being Residential Parents at 3-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 3	Model 1	Model 2	Model 3
	+ <i>prior</i> <i>incarceration</i>	+ <i>controls</i>	<i>Previously</i> <i>incarcerated</i>	+ <i>prior</i> <i>incarceration</i>	+ <i>controls</i>	<i>Previously</i> <i>incarcerated</i>
Recent incarceration	1.742 *** (0.205)	1.500 *** (0.213)	1.229 ** (0.382)	2.259 *** (0.318)	1.902 *** (0.328)	2.032 *** (0.406)
Constant	-2.846	-6.732	-8.231	-3.680	-13.274	-13.252
R-squared	0.097	0.194	0.250	0.097	0.194	0.250
N	1,894	1,894	500	1,894	1,894	500

Note: Coefficients for recent incarceration shown. All models include city fixed-effects. Standard errors in parentheses. Model 1 adjusts for prior incarceration. Model 2 adjusts for the following maternal characteristics (unless otherwise noted): prior incarceration (reported by mother and father), 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), child gender, child age, and child temperament. Model 3 includes all variables from Model 2 and restricts the sample to mothers attached to previously incarcerated fathers. \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Appendix A. OLS and Fixed-Effects Regression Models Estimating Father Engagement at 5-Year Survey as a Function of Recent Paternal Incarceration, Residential Parents**

	OLS models				Fixed-effect model
	Model 1	Model 2	Model 3	Model 4	Model 5
Recent incarceration	-1.467 *** (0.171)	-1.328 *** (0.177)	-1.262 *** (0.182)	-0.996 *** (0.230)	-0.725 *** (0.130)
Prior incarceration	-0.091 (0.089)	0.055 (0.123)	0.090 (0.105)	---	---
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	-0.104	-0.140	0.076

		(0.176)	(0.151)	(0.301)	(0.124)
Impulsivity		-0.118	-0.074	-0.027	---
		(0.078)	(0.073)	(0.131)	
Domestic violence		-0.278	-0.080	0.444	-0.528 **
		(0.310)	(0.338)	(0.494)	(0.190)
Substance abuse		-0.174	-0.108	-0.416	-0.177
		(0.172)	(0.178)	(0.424)	(0.140)
Child is male		-0.090	-0.110 ^	-0.185	---
		(0.064)	(0.059)	(0.164)	
Child age in months		-0.002	-0.018	-0.083 *	-0.021 **
		(0.016)	(0.014)	(0.037)	(0.007)
Child temperament		0.107 ^	0.088	0.016	---
		(0.059)	(0.057)	(0.124)	
Lagged engagement			0.521 ***	0.372 ***	---
			(0.034)	(0.079)	
Constant	3.207	-0.624	0.144	5.094	4.803
R-squared	0.069	0.140	0.278	0.279	0.358
N	1,894	1,894	1,894	500	1,894
Person-year observations	---	---	---	---	3,788

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



**Appendix B. OLS and Fixed-Effects Regression Models Estimating Father Engagement at 5-Year Survey as a Function of Recent Paternal Incarceration, Nonresidential Parents**

	OLS models				Fixed-effect model
	Model 1	Model 2	Model 3	Model 4	Model 5
Recent incarceration	-0.527 *** (0.064)	-0.498 *** (0.071)	-0.417 *** (0.072)	-0.424 *** (0.083)	-0.070 (0.088)
Prior incarceration	-0.278 ** (0.079)	-0.092 (0.081)	-0.031 (0.071)	---	---
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 (reference)		---	---	---	---
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	-0.219	-0.102	0.093

		(0.137)	(0.133)	(0.159)	(0.117)
Impulsivity		-0.080	-0.102 <sup>^</sup>	-0.102	---
		(0.055)	(0.055)	(0.067)	
Domestic violence		-0.022	0.012	-0.056	-0.074
		(0.074)	(0.080)	(0.094)	(0.104)
Substance abuse		-0.050	-0.015	0.063	-0.195 <sup>^</sup>
		(0.093)	(0.091)	(0.103)	(0.104)
Child is male		0.120 <sup>^</sup>	0.098	0.082	---
		(0.069)	(0.066)	(0.072)	
Child age in months		0.013	0.007	0.032	-0.010
		(0.019)	(0.016)	(0.019)	(0.007)
Child temperament		-0.092	-0.096	-0.101	---
		(0.063)	(0.059)	(0.073)	
Lagged engagement			0.367 ***	0.280 ***	---
			(0.026)	(0.042)	
Constant	1.239	0.289	0.597	-0.957	-1.002
R-squared	0.045	0.256	0.341	0.318	0.126
N	1,673	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. <sup>^</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Appendix C. Propensity Score Matching Models Predicting the Effect of Recent Paternal Incarceration on Father's Parenting**

**Panel A. Residential Fathers<sup>a</sup>**

	Treatment N	Control N	Change in engagement	Change in shared responsibility in parenting	Change in cooperation in parenting	Change in spanking	Change in parenting stress
Nearest neighbor	133	1,746	-1.131 *** (0.244)	-0.647 *** (0.135)	-0.260 ** (0.092)	-0.123 * (0.062)	-0.207 * (0.097)
Radius	133	1,746	-1.129 *** (0.232)	-0.671 *** (0.129)	-0.275 ** (0.087)	-0.121 * (0.059)	-0.148 (0.092)
Kernel	146	1,746	-1.153 *** (0.213)	-0.679 *** (0.122)	-0.321 *** (0.079)	-0.163 ** (0.051)	-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 spanking	Change in parenting stress
Nearest neighbor	470	1,179	-0.213 ^ (0.121)	-0.129 * (0.065)	-0.185 * (0.075)	-0.001 (0.023)	0.225 * (0.094)
Radius	470	1,179	-0.235 * (0.115)	-0.129 * (0.063)	-0.181 * (0.074)	-0.002 (0.022)	0.219 * (0.092)
Kernel	494	1,179	-0.287 ** (0.107)	-0.141 * (0.060)	-0.161 * (0.070)	0.008 (0.021)	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. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

<sup>a</sup> Residential parents includes all parents living together at the 3-year survey. Nonresidential parents includes all parents not living together at the 3-year survey.

**Appendix D. Descriptive Statistics of Biological and Social Fathers' Parenting at 5-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
Spanked child in past month	7.7%	15.4%	13.9%	8.3%
N	26	26	36	36

Note: Sample restricted to observations in which mothers are living with the child's biological father at the 3-year survey, have broken up with the biological father at the 5-year survey, and are living with a social father at the 5-year survey. Asterisks for statistical significance compare biological father parenting and social father parenting when biological father did and did not experience recent incarceration. \*\*\*  $p < 0.001$ .