

## Paternal Incarceration and Maternal Parenting

# The Consequences of Paternal Incarceration for Maternal Neglect and Harsh Parenting

Kristin Turney, *University of California–Irvine*

The rise in mass incarceration, as well as its unequal distribution across the population, may widen inequalities among individuals and families. In this manuscript, I use data from the Fragile Families and Child Wellbeing Study, a data source uniquely situated to understand the collateral consequences of incarceration, to consider the consequences of paternal incarceration for an overlooked aspect of family life: maternal parenting (measured by neglect, psychological aggression, and physical aggression). Results show that, among parents living together prior to paternal incarceration, confinement has modest, positive associations with maternal neglect and physical aggression, and that changes in family life (including relationship characteristics, economic insecurity, and mental health) following incarceration explain some of these associations. Additionally, there is some evidence that the consequences of paternal incarceration for neglect are strongest among mothers with a low propensity for sharing a child with a recently incarcerated father. Taken together, these results suggest that incarceration—given its concentration among disadvantaged families and, at least in one domain, its most consequential effects for the most advantaged of these disadvantaged families—has complicated and countervailing implications for inequalities in family life.

The rise in mass incarceration in the United States since the 1970s, as well as its unequal distribution across the population, may widen inequalities across individuals and families (Alexander 2010; Wakefield and Uggen 2010; Wildeman and Muller 2012). About 2.3 million individuals are incarcerated in the United States, and an additional 4.9 million individuals are on probation or parole, meaning that about 3 percent of adults currently experience some form of correctional supervision (Glaze 2011). Moreover, incarceration is unequally distributed across the population, disproportionately affecting poorly educated minority men (Wakefield and Uggen 2010), and the consequences of

*Direct correspondence to Kristin Turney, University of California–Irvine, 3151 Social Science Plaza, Irvine, CA 92697-5100; email: kristin.turney@uci.edu. Funding for the Fragile Families and Child Wellbeing Study was provided by the NICHD through grants R01HD36916, R01HD39135, and R01HD40421, as well as a consortium of private foundations (see <http://www.fragilefamilies.princeton.edu/funders.asp> for the complete list). This work benefited from conversations with Lonnie Berger, and the author is grateful to Jessica Hardie, Anita Zuberi, and the four anonymous Social Forces reviewers for helpful comments on earlier versions of the manuscript. Any errors are her own.*

incarceration for these men are well documented. Incarceration hinders employment prospects and diminishes earnings (Pager 2003; Western 2002), impedes civic engagement (Uggen and Manza 2002), compromises health (Massoglia 2008; Schnittker and John 2007), and increases the risk of divorce (Lopoo and Western 2005; Massoglia, Remster, and King 2011).

The effects of incarceration may also have implications for the women and children connected to these men, as incarcerated men are connected to families and research increasingly documents the consequences of incarceration for family life (e.g., Arditti 2012; Comfort 2008). But little research considers the possibility that paternal incarceration may be consequential for neglect and harsh parenting among women who share children with incarcerated men (though see Jones [2013]). This is an unfortunate gap for three reasons. First, research considering the effects of paternal incarceration on children speculates that maternal parenting is a critical mechanism through which incarceration confers disadvantages (Geller et al. 2012; Wildeman 2010), but virtually no research considers the direct relationship between paternal incarceration and maternal parenting (for an exception focused on time spent engaged with children, see Turney and Wildeman [2013]). Second, maternal neglect and harsh parenting are independently linked to detrimental outcomes for children, especially socioemotional and health difficulties, throughout the life course (Bodovski and Youn 2010; Hildyard and Wolfe 2002; Kotch et al. 2008; Taylor et al. 2010; Whitaker et al. 2007). Finally, it is crucial to understand the spillover effects of incarceration for mothers who share children with incarcerated men because these mothers are an economically and socially disadvantaged group, prior to paternal incarceration, and likely face a multitude of obstacles to their own well-being, some of which may stem from paternal incarceration.

Family stress process theory provides some guidance as to why paternal incarceration may have deleterious effects on maternal parenting. Indeed, incarceration is a stressor to the family unit. It removes fathers from households, of course, but it also strains family relationships (Comfort 2008; Massoglia, Remster, and King 2011), diminishes family income (Chung 2012; Schwartz-Soicher, Geller, and Garfinkel 2011), and encumbers maternal mental health and instrumental support (Turney, Schnittker, and Wildeman 2012; Wildeman, Schnittker, and Turney 2012), both during incarceration and after release, all of which may negatively influence mothers' parenting. It is likely quite possible that mothers do not have identical responses to paternal incarceration (e.g., Dyer, Pleck, and McBride 2012; Sampson 2011; Turanovic, Rodriguez, and Pratt 2012). Alternatively, any observed association between paternal incarceration and maternal parenting may result from social selection processes, as families that experience paternal incarceration also experience numerous disadvantages prior to incarceration (Giordano 2010).

In this manuscript, I extend research on the collateral consequences of incarceration for family life by addressing three previously unanswered research questions. First, among parents living together prior to incarceration, how is paternal incarceration associated with maternal neglect and harsh parenting (measured as psychological aggression and physical aggression) when children

are five years old? Second, to what extent do mothers' relationship with the child's father, economic insecurity, and mental health explain the association between paternal incarceration and maternal parenting? Third, how does the association between paternal incarceration and maternal parenting differ by mothers' propensity for sharing a child with an incarcerated father? I use data from the Fragile Families and Child Wellbeing Study, a longitudinal data source distinctively positioned to understand the consequences of incarceration for family life. These data comprise a large number of ever-incarcerated men, include established measures of neglect and harsh parenting, and allow for a rigorous adjustment of pre-existing differences between families that have and have not experienced paternal incarceration. Given the considerable number of families experiencing paternal incarceration and the unequal distribution of incarceration across the population, disentangling the average and heterogeneous consequences of paternal incarceration for maternal parenting will shed light on how and under what conditions incarceration affects American families.

## Background

### ***Family Stress Process Theory and the Association between Paternal Incarceration and Maternal Parenting***

Family stress process theory provides a useful theoretical framework for understanding the relationship between paternal incarceration and maternal parenting (Conger et al. 1990). This theory, initially conceptualized to describe how economic insecurity generates stress within families, can be extended to explain the consequences of paternal incarceration for family life. Indeed, incarceration is a stressful life event for the incarcerated (Turney, Wildeman, and Schnittker 2012). But it is also a stressful life event for family members of the incarcerated, as the deep bonds between kin mean that stressful life events experienced by one family member can have reverberating influences on others (also see Elder, Johnson, and Crosnoe [2003]; Pearlin [1989]). Further, family stress process theory suggests that such stress negatively influences aspects of family functioning, including parenting (Conger et al. 1990).

Indeed, the majority of currently and formerly incarcerated men are embedded in families. Because most inmates are in romantic relationships and the majority have children (Mumola 2000), incarceration may have unintended and far-reaching spillover effects on family life. Prior to incarceration, many fathers—especially those living with their children—contribute economically to their children's households, maintain contact with their children, and assist mothers with daily activities (Geller, Garfinkel, and Western 2011; Turanovic, Rodriguez, and Pratt 2012; Turney and Wildeman 2013). For many families, then, the involuntary removal of a father is a stressor to the family system that upsets daily routines, interferes with family economic and social resources, and puts additional care responsibilities on mothers.

Though the effect of paternal incarceration may be direct, there are also at least three mechanisms through which incarceration may exert deleterious

effects on maternal parenting. First, paternal incarceration may increase maternal neglect and harsh parenting by putting stress on the parental relationship. Maintaining romantic relationships while one partner is behind bars is complicated, given the far distance of prisons to some communities, inflexible visiting schedules, and the expense of making long-distance phone calls from prison (Braman 2004; Comfort 2008). It may be equally difficult to preserve romantic relationships after release (Lopoo and Western 2005; Massoglia, Remster, and King 2011). Ethnographic work shows that the incarceration experience may encourage men to participate in violent behavior (Nurse 2002) and that recently released men withdraw from social institutions to avoid interactions with the police (Goffman 2009). In turn, relationship tensions and instability may impede effective parenting. Relationship instability may render mothers unable to provide warm and engaged parenting or trigger financial shocks that diminish parenting quality (e.g., Beck et al. 2010).

Beyond relationship instability, paternal incarceration may strain economic well-being and, therefore, encumber effective parenting among mothers. Incarcerated men have few opportunities to earn income and, upon release, their criminal record makes obtaining employment difficult (Pager 2003). Given that the majority of men contribute economically to family life prior to incarceration, incarceration reduces family income, intensifies material hardship, and increases reliance on some forms of public assistance (Geller, Garfinkel, and Western 2011; Schwartz-Soicher, Geller, and Garfinkel 2011; Sugie 2012). Such economic stress may increase maternal neglect and harsh parenting, making it prohibitive for mothers to provide children with adequate resources (e.g., food) or triggering mothers to engage in punitive behaviors (Slack et al. 2004).

Finally, maternal mental health may be a mechanism linking paternal incarceration to maternal neglect and harsh parenting. Qualitative research documents that the time a current or former romantic partner is incarcerated is fraught with anxiety, uncertainty, and loneliness among mothers (Daniel and Barrett 1981; Fishman 1990; Goffman 2009). These feelings may be exacerbated when mothers, generally the individuals who link incarcerated men with their children, bring children to visit their father. They may also persist after the father's release, as women worry about their partners violating parole (Goffman 2009) and their children's adjustment to their father's return (Turanovic, Rodriguez, and Pratt 2012). Additionally, recent quantitative research finds demonstrable effects of romantic partner incarceration for depression and life dissatisfaction among mothers (Wildeman, Schnittker, and Turney 2012). Maternal depression, in turn, may impair relationships with children. Depressed mothers may be unable to effectively engage with their children, instead resorting to neglectful behaviors or harsh discipline (Lovejoy et al. 2000; Turney 2011).

### ***Heterogeneous Association between Paternal Incarceration and Maternal Parenting***

Family stress process theory suggests that the stressor of paternal incarceration will be consequential for all mothers. But other theories suggest that there may

be heterogeneity in the association between paternal incarceration and maternal parenting and that some mothers suffer more severe consequences than others. On the one hand, cumulative disadvantage theory (DiPrete and Eirich 2006) implies that the deleterious effects of paternal incarceration on maternal parenting may be strongest for mothers who are most likely to share a child with an incarcerated father. Social disadvantages do not occur in isolation and, indeed, these mothers are likely disadvantaged across other domains that pose challenges to effective parenting. They are, for example, more likely than other mothers to be racial/ethnic minorities, not have graduated from high school, be unmarried, and report depression (Wildeman, Schnittker, and Turney 2012). These disadvantaged mothers, when coping with paternal incarceration, may lack economic resources to financially weather the incarceration of a partner or may lack emotional or instrumental support (e.g., child care), which may trigger neglect or harsh parenting. Thus, the incarceration of a child's father may be especially deleterious for the most disadvantaged mothers.

On the other hand, theory about event stressors suggests that the deleterious effects of paternal incarceration on maternal parenting may be strongest for mothers who are least likely to share a child with an incarcerated father. Event stressors, stressful life events that are sudden and unexpected, may be especially detrimental to well-being (Eaton 1978; Wheaton 1982). Mothers least likely to share a child with an incarcerated father, though advantaged in a number of ways, experience considerable challenges in the face of paternal incarceration. For one, paternal incarceration may be a distinctive, unanticipated shock to the family system that negatively affects their parenting behaviors. Relatedly, these relatively advantaged mothers likely have more resources overall and share children with fathers who are contributing important economic and social resources to the household prior to incarceration, which may make the fathers' incarceration experience especially damaging. Prior research provides evidence that the effects of incarceration on families are strongest for more advantaged families. For example, quantitative research shows that incarceration is more detrimental for residential fathers' parenting than non-residential fathers' parenting (Turney and Wildeman 2013; also see Wildeman 2010, 2012).

### ***Threats to Causal Inference***

Taken together, existing evidence provides strong support that paternal incarceration is positively associated with maternal neglect and harsh parenting. But social selection processes are a considerable threat to causal inference. Incarceration is unequally distributed across the population, and mothers who share children with incarcerated fathers are more disadvantaged than their counterparts. Prior to a father's incarceration, mothers who share children with these men report less education, more relationship instability, and more economic insecurity (Turney, Schnittker, and Wildeman 2012, 1155–56). Given that neglect and harsh parenting are also, on average, more common among disadvantaged mothers, the relationship between paternal incarceration and maternal parenting may be spurious.

Another possibility is that the average association between paternal incarceration and maternal parenting is positive. Incarcerated men are more likely than their counterparts, prior to incarceration, to abuse substances, engage in domestic violence, and exhibit impulsive behaviors (Turney, Schnittker, and Wildeman 2012, 1155–56). The unpredictable and violent nature of some of these men may drain economic and emotional resources from the family system (Giordano 2010; Turanovic, Rodriguez, and Pratt 2012), and their incarceration may give women more control over family economic resources (Fishman 1990). In these cases, the removal of a violent or abusive father may reduce maternal stress and increase effective parenting. Taken together, it is plausible that paternal incarceration is deleterious for maternal parenting, helpful for maternal parenting, or inconsequential for maternal parenting and, accordingly, an appropriate research design must consider these possibilities.

## Data, Measures, and Analytic Strategy

### *Data*

Data come from the Fragile Families and Child Wellbeing Study, a longitudinal study of 4,898 new and mostly unmarried parents in 20 large US cities that were stratified by labor market conditions, welfare generosity, and child support policies (Reichman et al. 2001). Between February 1998 and September 2000, mothers completed a 30- to 40-minute in-person interview at the hospital after the birth of their child and fathers were interviewed as soon as possible after the child's birth. Mothers and fathers were then interviewed by telephone when their children were approximately one, three, five, and nine years old, and these analyses rely primarily on information garnered from the mothers' interviews. Of mothers who responded to the baseline interview, 89, 86, 85, and 76 percent completed the one-, three-, five-, and nine-year surveys, respectively.

Additional data come from the five-year In-Home Longitudinal Study of Pre-School Aged Children, a subsample of families who participated in the Fragile Families survey ( $n = 3,001$ ). When children were approximately five years old, researchers administered a parent survey questionnaire and an activity booklet in the child's home. In the parent survey, the child's caregiver (in 96 percent of observations, the child's mother) answered questions about family functioning, including neglect and harsh parenting. About 81 percent of families eligible to participate in the five-year In-Home survey completed the survey (for more details, see Bendheim-Thoman Center for Research on Child Wellbeing [2009]).

The analytic sample for this study comprises the 1,509 mothers who participated in the five-year In-Home survey and were living with the focal child's father at the three-year survey (prior to the measure of incarceration). Because the analytic sample excludes parents not living together at the three-year survey, there are statistically significant and substantively important observed differences between the analytic sample and the full sample. For example, mothers in the analytic sample, compared to those in the full sample, are more likely to be non-Hispanic White (30 compared to 21 percent), less likely to be non-Hispanic Black (36 compared to 48 percent), and more likely to be born outside the United States

(20 compared to 17 percent). Mothers in the analytic sample are older (29 years old, on average, compared to 28), are more likely to have education beyond high school (53 compared to 45 percent), and are more likely to report stable employment (38 compared to 34 percent). Importantly, they are less likely to share children with recently incarcerated men (10 compared to 17 percent).

The majority of variables are missing fewer than 3 percent of observations. Exceptions include fathers' impulsivity (14 percent of observations are missing values) and the lagged dependent variables (11, 12, and 12 percent of observations are missing values for the lagged measures of neglect, psychological aggression, and physical aggression, respectively). I preserve missing data by generating five multiply imputed data sets.

## **Measures**

### **Maternal neglect and harsh parenting**

The three dependent variables, measured at the five-year In-Home survey, include maternal neglect, psychological aggression, and physical aggression. It is especially important to understand the antecedents of neglect and harsh parenting when children are five years old, as this is an especially critical life course stage (Entwisle and Alexander 1989). Mothers were asked a series of questions from the Parent-Child Conflict Tactics Scales (CTSPC)(Straus et al. 1998). *Neglect* is measured by responses to the following five questions about behaviors in the past year: (1) had to leave your child home alone, even when you thought some adult should be with him/her; (2) were so caught up in your own problems that you were not able to show or tell your child that you loved him/her; (3) were not able to make sure child got the food he/she needed; (4) were not able to make sure your child got to a doctor or hospital when he/she needed it; and (5) were so drunk or high that you have a problem taking care of your child ( $\alpha = .45$ ). I use prevalence measures for each of the five indicators of neglect (1 = *happened*, 0 = *did not happen*), and the final measure of neglect is a count of these five dummy variables.<sup>1</sup>

In addition, mothers were asked a variety of CTSPC questions about psychological and physical aggression. *Psychological aggression* is measured by the following: (1) shouted, yelled, or screamed at child; (2) threatened to spank or hit child but did not actually do it; (3) swore or cursed at child; (4) called child dumb or lazy or some other name like that; and (5) said she would send child away or would kick him/her out of the house ( $\alpha = .48$ ). *Physical aggression* is measured by the following: (1) spanked child on the bottom with bare hand; (2) hit child on the bottom with something like a belt, hairbrush, stick, or some other hard object; (3) slapped child on the hand, arm, or leg; (4) pinched child; and (5) shook child ( $\alpha = .52$ ). Similar to the measure of neglect, I use prevalence measures for each indicator and the final measures of psychological aggression and physical aggression are counts of the individual dummy variables.<sup>2</sup>

### **Paternal incarceration**

*Recent paternal incarceration* is the primary explanatory variable. Fathers are considered recently incarcerated if they spent time in prison or jail at any

point after the three-year survey up to and including the five-year survey. I rely on both paternal and maternal reports of paternal incarceration, assuming the father was incarcerated if at least one report is affirmative, consistent with other research demonstrating the effectiveness of this approach (Geller et al. 2012). Though these data provide an exceptional opportunity to examine the consequences of incarceration for family life, and are commonly used to answer such questions (e.g., Schwartz-Soicher, Geller, and Garfinkel 2011; Sugie 2012; Turney, Schnittker, and Wildeman 2012), the measure of recent incarceration is limited with respect to the duration and type of incarceration. For example, incarceration lasting one week is likely differentially associated with parenting than incarceration lasting one year, and prison incarceration and jail incarceration may differentially affect parenting. These data provide inadequate opportunities to consider such nuances, a point I return to in the discussion.

### **Control variables**

The analyses include a host of mother, father, and child characteristics that may render the association between paternal incarceration and maternal parenting spurious. Maternal characteristics include the following: race (non-Hispanic White, non-Hispanic Black, Hispanic, non-Hispanic other race), foreign-born status, family structure at age 15, age, education (less than high school diploma, high school diploma or GED, postsecondary education), number of children in the household, stable employment (measured affirmatively if the mother reported working at the one- and three-year surveys), poverty status, cohabiting with father, major depression (measured by the Composite International Diagnostic Interview-Short Form (CIDI-SF) (Kessler et al. 1998), ever incarcerated, and substance use (measured affirmatively if mother reported that she, in the past month, had more than four drinks in one sitting or used illicit drugs). The analyses include three measures of child characteristics—gender, temperament (Buss and Plomin 1984), and low birth weight (less than 2,500 grams)—and maternal parenting at the three-year survey.

Additionally, the analyses also include paternal characteristics that may account for selection into incarceration. These characteristics include age, education, and stable employment (measured affirmatively if the father reported working at the baseline, one-year, and three-year surveys), as well as four other characteristics especially associated with selection into incarceration (impulsivity, domestic violence, substance abuse, and prior incarceration). Impulsivity is measured with an abbreviated form of Dickman's (1990) impulsivity scale ( $\alpha = .83$ ). Fathers engaged in domestic violence if the mother reported that he hit, slapped, or kicked her at any point up to and including the three-year interview. Fathers are considered to have a drug or alcohol problem if he or the mother, at any point up to and including the three-year interview, reported that drugs or alcohol interfered with his work or that drugs or alcohol made it difficult for him to get a job or get along with friends or family. Prior paternal incarceration includes any incarceration at or before the three-year survey (including prior to the child's birth).



## Mechanisms

In some analyses, I consider three sets of mechanisms, all measured at the five-year survey (and, thus, after recent paternal incarceration): relationship characteristics (a dummy variable indicating that the mother and father separated and a continuous measure of mother-reported overall relationship quality [1 = *poor* to 5 = *excellent*]), economic insecurity (mothers' poverty and material hardship), and mental health (mothers' depression and parenting stress).

## Analytic Strategy

The analytic approach, which ensues in four stages, relies primarily on propensity score methods to consider the relationship between recent paternal incarceration and maternal parenting. Propensity score matching is one methodological strategy that social scientists use to account for social selection and diminish concerns about pre-existing differences between groups (Morgan and Harding 2006; Rosenbaum and Rubin 1983). Given the nonrandom nature of paternal incarceration, as well as the infeasibility of randomly assigning fathers to incarceration, propensity score matching is particularly useful for studying the consequences of incarceration. Propensity score matching approximates an experimental design by using observed variables to create a treatment group (e.g., mothers who share children with recently incarcerated fathers) and a control group (e.g., mothers who share children with not recently incarcerated fathers) that are similar in their distribution of covariates. Propensity score matching, however, does not adjust for unobserved characteristics. Therefore, though the analyses proceed under the assumption that there are no unobserved confounders, often called the ignorability assumption (Morgan and Harding 2006), it is possible that unobserved selection into incarceration exists, a point I return to in the discussion.

In the first analytic stage, logistic regression models estimate propensity scores for the probability of sharing a child with a recently incarcerated father based on the covariates described above (tables 3 and 4). After estimating propensity scores, I confirm the balance of the observed covariates to ensure that observations in the treatment and control groups have a similar distribution of covariates. Sample means of covariates in the treatment and control groups are not statistically different from one another (at the  $p < .05$  level). Importantly, because these analyses rely on five imputed data sets, I calculate propensity scores and ensure balance between treatment and control observations separately for each imputed data set. Two variables, mother foreign-born and father prior incarceration, remained significantly ( $p < .05$ ) or marginally significantly ( $p < .10$ ) different across treatment and control groups. But because both variables are, theoretically, strongly associated with selection into incarceration and because their inclusion provided substantively similar results as their exclusion, I include them in generating the propensity score across all data sets.

In the second analytic stage, I use three types of matching strategies to estimate the *average* association between recent paternal incarceration and maternal parenting (table 5). First, I use kernel matching to match treatment

observations (mothers who share children with recently incarcerated fathers) to control observations (mothers who share children with not recently incarcerated fathers). Kernel matching compares each treatment observation with all control observations, but weights the control observations according to their distance from treated cases (kernel = Epanechnikov; bandwidth = 0.06). I also use nearest-neighbor matching (which compares each treatment observation to the 10 closest control observations) and radius matching (which compares each treatment observation to control observations within a radius of .005). Neglect is estimated with a negative binomial regression model (because the variance is larger than the mean), and psychological aggression and physical aggression are estimated with Poisson regression models (because the variance and mean are similar). I average results across the five imputed data sets (Rubin 1987).

The third analytic stage considers the following three sets of mechanisms that may link recent paternal incarceration to maternal parenting: relationship characteristics (separation from father and relationship quality), economic insecurity (poverty and material hardship), and mental health (depression and parenting stress), all measured at the five-year survey (table 6). I first estimate each of the six mechanisms as a function of the treatment, recent paternal incarceration (results discussed but not presented). I then use negative binomial (for estimates of neglect) and Poisson (for estimates of psychological aggression and physical aggression) regression models to consider how each set of mechanisms alters the association between the treatment and maternal parenting.

The final analytic stage estimates the *heterogeneous* association between recent paternal incarceration and maternal parenting (table 7). This approach allows me to consider how the association between recent paternal incarceration and maternal parenting varies by an observed distribution of covariates (i.e., the observed propensity for recent paternal incarceration). I first group observations into three strata based on their propensity score ( $p = [.00-.05]$ ,  $p = [.05-.15]$ ,  $p = [.15-.79]$ ).<sup>3</sup> Observations in the first stratum have the lowest likelihood of experiencing recent paternal incarceration, and observations in the third stratum have the highest likelihood of experiencing recent paternal incarceration. There are no statistically significant differences in the covariates across treatment and control groups within each stratum (see appendix A).<sup>4</sup>

In level 1, I estimate the stratum-specific association between recent paternal incarceration and maternal parenting. Similar to the above, negative binomial regression models estimate neglect and Poisson regression models estimate psychological aggression and physical aggression. Level 2 estimates the trend in the variation of associations by propensity score stratum. A positive, significant coefficient means that, for each unit change in stratum, there is an increase in the association between recent paternal incarceration and the dependent variable (and a negative, significant coefficient means that there is a decrease in the association). These multilevel analyses, conducted using Stata-compatible software by Jann, Brand, and Xie (2007), have recently been used to consider variation in the effects of educational attainment (Brand 2010; Brand and Xie 2010; Musick, Brand, and Davis 2012; Schafer, Wilkinson, and Ferraro 2013) but have not been applied to research on incarceration. Because the trend across

strata cannot be generated with multiply imputed data, these analyses use only the first imputed data set. Results are substantively similar across all of the five imputed data sets, but the use of a single data set may artificially inflate the standard errors and, accordingly, these analyses are considered preliminary.

### ***Sample Description***

Descriptive statistics for all observations are presented in table 1. About 10 percent of mothers in the analytic sample share children with a recently incarcerated father. The average mother reports 0.124 occurrences of neglect, 1.952 occurrences of psychological aggression, and 1.530 occurrences of physical aggression. The sample is relatively disadvantaged across a wide range of demographic characteristics. About seven in 10 mothers are racial/ethnic minorities. At the three-year survey (and, thus, prior to recent incarceration), about half of mothers (47 percent) and fathers (54 percent) have no education beyond high school, and about two-fifths of mothers (38 percent) and three-fifths (58 percent) of fathers are stably employed. More than two-fifths of mothers are cohabiting with the father, 30 percent have household incomes below the poverty line, and 16 percent report major depression.

The descriptive statistics for the entire sample, though, mask variation by recent paternal incarceration. As shown in table 2, mothers who share children with recently incarcerated fathers, compared to their counterparts, report more neglect (0.231, compared to 0.113,  $p < .001$ ), more psychological aggression (2.140, compared to 1.932,  $p < .001$ ), and more physical aggression (1.923, compared to 1.489,  $p < .001$ ).

## **Results**

### ***Generating the Propensity Score for Recent Paternal Incarceration***

Table 3 presents results from the logistic regression model used to generate a propensity score for each observation in the first imputed data set (with the estimates similar across the five imputed data sets). In this model, recent paternal incarceration is estimated as a function of the covariates in table 1. Findings are consistent with expectations. For example, mothers who lived with their biological parents at age 15, compared to their counterparts, are less likely to experience the incarceration of a child's father (OR = 0.60,  $p < .05$ ). Depressed mothers are 1.64 times more likely than their non-depressed counterparts to experience paternal incarceration ( $p < .05$ ), and maternal incarceration is also correlated with paternal incarceration (OR = 4.17,  $p < .01$ ).

Also consistent with expectations, paternal characteristics are strongly associated with recent incarceration. Paternal age is inversely associated with recent incarceration (OR = 0.95,  $p < .05$ ). Incarceration is less common among fathers with a high school diploma and post-secondary education, compared to their counterparts without a high school diploma, and less common among stably employed fathers (OR = 0.53,  $p < .01$ ). Fathers' engagement in domestic violence (OR = 10.62,  $p < .001$ ), substance abuse (OR = 2.65,  $p < .05$ ), and prior

**Table 1. Descriptive Statistics of Variables Used in Analyses**

	Full sample	
	% or mean	(SD)
<i>Key variables</i>		
Mother neglect (ih5)	0.124	(0.429)
Mother psychological aggression (ih5)	1.952	(0.970)
Mother physical aggression (ih5)	1.530	(1.178)
Father recent paternal incarceration (y5)	9.5%	
<i>Control variables</i>		
Mother race (b)		
Non-Hispanic White	30.0%	
Non-Hispanic Black	36.0%	
Hispanic	30.0%	
Non-Hispanic other race	4.0%	
Mother foreign-born (b)	19.6%	
Mother lived with both biological parents at age 15 (b)	51.2%	
Mother age (y3)	29.379	(6.151)
Father age (y3)	31.896	(7.151)
Mother education (y3)		
Less than high school	24.7%	
High school diploma or GED	22.8%	
Post-secondary education	52.6%	
Father education (y3)		
Less than high school	26.4%	
High school diploma or GED	27.3%	
Post-secondary education	46.3%	
Mother number of children in household (y3)	2.328	(1.277)
Mother stable employment (y3)	37.9%	
Father stable employment (y3)	57.5%	
Mother poverty (y3)	30.0%	
Mother cohabiting with father (y3)	40.1%	
Mother depression (y3)	16.4%	
Mother ever incarcerated (b, y1, y3)	1.5%	
Mother substance use (y1, y3)	12.3%	
Child male (b)	51.2%	
Child temperament (y1)	3.471	(0.741)
Child low birth weight (b)	7.8%	
Father impulsivity (y1)	1.954	(0.640)

(Continued)

**Table 1. continued**

	Full sample	
	% or mean	(SD)
Father engaged in domestic violence (y3)	2.0%	
Father substance abuse (y3)	4.4%	
Father prior incarceration (b, y1, y3)	26.8%	
Mother neglect (ih3)	0.123	(0.436)
Mother psychological aggression (ih3)	1.776	(0.919)
Mother physical aggression (ih3)	1.579	(1.108)
<i>Mechanisms</i>		
Mother and father separated (y5)	20.6%	
Mother relationship quality (y5)	3.619	(1.255)
Mother poverty (y5)	30.4%	
Mother material hardship y5)	1.756	(2.137)
Mother depression (y5)	14.6%	
Mother parenting stress (y5)	2.146	(0.665)
N	1,509	

**Note:** b = measured at baseline interview, y1 = measured at one-year telephone interview, y3 = measured at three-year telephone interview, y5 = measured at five-year telephone interview, ih3 = measured at three-year in-home interview, ih5 = measured at five-year in-home interview.

**Table 2. Means of Maternal Parenting, by Recent Paternal Incarceration**

	Recent paternal incarceration	
	Yes	No
Mother neglect	0.231	0.113***
Mother psychological aggression	2.140	1.932***
Mother physical aggression	1.923	1.489***
N	143	1,366

**Note:** Asterisks indicate statistically significant differences between mothers who do and do not share children with recently incarcerated fathers.

\*\*\*  $p < .001$  (two-tailed tests)

incarceration (OR = 4.82,  $p < .001$ ) are positively associated with recent incarceration. Importantly, this model fits the data well, explaining nearly one-third (31 percent) of the variance in recent paternal incarceration.

### ***Estimating Average Association between Paternal Incarceration and Maternal Parenting***

Table 4 shows descriptive statistics that compare the characteristics of families that do and do not experience recent paternal incarceration, before and after

**Table 3. Logistic Regression Model Estimating Recent Paternal Incarceration**

Mother race (reference = non-Hispanic White)	
Non-Hispanic Black	0.255 (0.306)
Hispanic	-0.183 (0.340)
Non-Hispanic other race	0.854 (0.656)
Mother foreign-born	-0.662 (0.438)
Mother lived with both biological parents at age 15	-0.514* (0.238)
Mother age	-0.024 (0.028)
Father age	-0.056* (0.023)
Mother education (reference = less than high school)	
High school diploma or GED	-0.063 (0.287)
Post-secondary education	0.165 (0.277)
Father education (reference = less than high school)	
High school diploma or GED	-0.489 (0.253)
Post-secondary education	-0.972** (0.305)
Mother number of children in household	-0.004 (0.088)
Mother stable employment	-0.108 (0.242)
Father stable employment	-0.639** (0.236)
Mother poverty	-0.047 (0.240)
Mother cohabiting with father	-0.082 (0.232)
Mother depression	0.495* (0.243)

*(Continued)*

**Table 3. continued**

Mother ever incarcerated	1.428** (0.541)
Mother substance abuse	0.465 (0.276)
Child male	0.319 (0.212)
Child temperament	0.015 (0.138)
Child low birth weight	-0.189 (0.364)
Father impulsivity	0.273 (0.156)
Father engaged in domestic violence	2.363*** (0.560)
Father substance abuse	0.974* (0.389)
Father prior incarceration	1.572*** (0.240)
Mother physical aggression (lagged)	-0.040 -0.102
Pseudo <i>R</i> -squared	0.310
Constant	-0.803
<i>N</i>	1,509

**Note:** Results presented for first imputed data set. Standard errors in parentheses.

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  (two-tailed tests)

matching on the propensity score. Turning first to the pre-match descriptive differences, which are presented for the first imputed data set, these descriptive statistics show that there are substantial and statistically significant observed differences between these two groups of families. These differences exist across nearly every demographic, socioeconomic, and behavioral characteristic considered. For example, about 50 percent of women who share children with recently incarcerated fathers have household incomes below the poverty line, compared to 27 percent of their counterparts ( $p < .001$ ).

Does matching ensure that the treatment and control groups have similar observed characteristics? This table shows that, after kernel matching, the treatment and control groups have similar observed characteristics. Looking at the  $p$ -value columns, across each of the imputed data sets, shows that, with the exception of mothers' foreign-born status and fathers' prior incarceration (which sometimes show significant or marginally significant differences), there are no

**Table 4. Covariate Balance, Before and After Matching**

	Imputed data set = 1						% bias reduction	p	= 2	p	= 3	p	= 4	p	= 5
	Unadjusted mean		Difference in mean		Unadjusted	Postmatch									
	Recently incarcerated	Not recently incarcerated	Unadjusted	Postmatch											
Mother race (reference = non-Hispanic White)															
Non-Hispanic Black	0.524	0.342***	0.182	0.068	0.250	0.451	0.318	0.343	0.381						
Hispanic	0.273	0.303	-0.030	-0.048	0.373	0.612	0.440	0.414	0.476						
Non-Hispanic other race	0.028	0.042	-0.014	0.004	0.817	0.593	0.797	0.595	0.758						
Mother foreign-born	0.077	0.209***	-0.132	-0.084	36.5	0.029	0.094	0.100	0.098						
Mother lived with both biological parents at age 15	0.287	0.536***	-0.249	-0.089	64.3	0.111	0.274	0.245	0.241						
Mother age	25.892	29.745***	-3.853	-0.630	83.7	0.336	0.413	0.433	0.391	0.411					
Father age	28.038	32.300***	-4.262	-0.870	79.6	0.267	0.266	0.288	0.226	0.267					
Mother education (reference = less than high school)															
High school diploma or GED	0.259	0.225	0.034	0.048	0.342	0.370	0.387	0.366	0.446						
Post-secondary education	0.371	0.542***	-0.171	-0.022	87.2	0.703	0.782	0.689	0.785						
Father education (reference = less than high school)															
High school diploma or GED	0.322	0.268	0.054	0.018	67.4	0.750	0.611	0.786	0.775	0.607					
Post-secondary education	0.182	0.492***	-0.310	-0.062	80.1	0.203	0.193	0.205	0.227	0.235					
Mother number of children in household	2.418	2.319	0.099	0.001	98.9	0.995	0.937	0.807	0.992	0.801					
Mother stable employment	0.294	0.388*	-0.094	0.011	88.8	0.844	0.860	0.843	0.852	0.806					



Father stable employment	0.280	0.605***	-0.325	-0.098	69.9	0.078	0.108	0.095	0.181	0.106
Mother poverty	0.504	0.274***	0.230	0.010	95.7	0.867	0.822	0.922	0.919	0.926
Mother cohabiting with father	0.608	0.379***	0.229	0.015	93.3	0.792	0.998	0.777	0.944	0.845
Mother depression	0.315	0.148***	0.167	0.023	86.6	0.681	0.689	0.813	0.688	0.669
Mother ever incarcerated	0.063	0.010***	0.053	0.010	80.3	0.708	0.683	0.946	0.984	0.997
Mother substance abuse	0.224	0.112***	0.112	0.040	64.7	0.410	0.401	0.330	0.468	0.344
Child male	0.573	0.505	0.068	0.052	23.3	0.375	0.473	0.497	0.406	0.348
Child temperament	3.312	3.488**	-0.176	-0.040	77.3	0.669	0.639	0.797	0.854	0.816
Child low birth weight	0.091	0.076	0.015	0.018	-18.1	0.593	0.718	0.876	0.851	0.957
Father impulsivity	2.216	1.927***	0.289	0.126	56.5	0.133	0.183	0.138	0.221	0.247
Father engaged in domestic violence	0.119	0.010***	0.109	0.004	96.0	0.909	0.804	0.654	0.813	0.819
Father substance abuse	0.154	0.032***	0.122	0.018	85.5	0.672	0.293	0.406	0.457	0.295
Father prior incarceration	0.755	0.217***	0.538	0.111	79.3	0.041	0.054	0.061	0.031	0.058
Mother neglect	0.244	0.111***	0.133	0.012	76.0	0.877	0.776	0.755	0.807	0.658
Mother psychological aggression	1.972	1.755**	0.217	0.013	77.2	0.903	0.81	0.789	0.796	0.777
Mother physical aggression	1.779	1.558*	0.221	0.071	68.0	0.579	0.538	0.861	0.727	0.766

**Note:** Asterisks indicate statistically significant pre-match differences between mothers who do and do not share children with recently incarcerated fathers. Postmatch estimates based on kernel matching.

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  (two-tailed tests)

statistically significant differences across the treatment and control groups. Also, with few exceptions, matching produced a decrease in bias.

Next, in table 5, I present matched estimates of the association between recent paternal incarceration and maternal parenting. The first column presents differences between the treatment and control groups based on kernel matching. These coefficients suggest that mothers who share children with recently incarcerated fathers, compared to their counterparts, are more likely to engage in neglect ( $b = 0.641, p < .05$ ) and physical aggression ( $b = 0.153, p < .05$ ), and that the observed association between paternal incarceration and psychological aggression results from social selection forces. These results are similar across nearest-neighbor matching and radius matching strategies.

Given that propensity score techniques do not take into account individuals' unobserved characteristics, and are thus subject to spuriousness, I conduct a sensitivity analysis to examine the robustness of the association between paternal incarceration and maternal parenting. In falsification tests, I use negative binomial (for neglect) and Poisson (for psychological aggression and physical aggression) regression models to estimate the three measures of maternal parenting as a function of future paternal incarceration (measured between the five- and nine-year surveys) and all control variables. Here, I expect to find no relationship between future paternal incarceration and maternal parenting, and the presence of one might indicate spuriousness (or reverse causality). I find no association between future paternal incarceration and maternal parenting ( $p$  for future paternal incarceration = .919, .397, and .641 for neglect, psychological aggression, and physical aggression, respectively), suggesting that spuriousness and reverse causality are unlikely threats to causal inference.

**Table 5. Propensity Score Matching Estimates of the Association between Recent Paternal Incarceration and Maternal Parenting**

	Matched difference		
	Kernel	Nearest neighbor	Radius
Mother neglect	0.614* (0.301)	0.808** (0.299)	0.745** (0.253)
Mother psychological aggression	0.041 (0.050)	0.031 (0.078)	0.106 (0.062)
Mother physical aggression	0.153* (0.076)	0.150* (0.073)	0.242*** (0.067)

**Note:** Propensity scores are estimated with a logistic regression model estimating recent paternal incarceration as a function of pre-incarceration covariates. Neglect is estimated with a negative binomial model, and psychological aggression and physical aggression are estimated with Poisson regression models. Standard errors in parentheses. *Ns* for treatment and control groups vary by matching strategy (143 and 1,366, respectively, for kernel matching; 112 and 489 for nearest-neighbor matching; and 120 and 1,319 for radius matching).

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  (two-tailed tests)

### ***Mechanisms Underlying the Association between Recent Paternal Incarceration and Maternal Parenting***

I next consider the mechanisms underlying the association between paternal incarceration and maternal parenting (focusing only on neglect and physical aggression, since there is no robust average relationship between paternal incarceration and psychological aggression). I first regress each of the mechanisms (relationship dissolution, relationship quality, poverty, material hardship, depression, and parenting stress) on the treatment, recent paternal incarceration. I find that recent paternal incarceration is associated with five of the six proposed mechanisms (results not presented). There is no independent association between recent paternal incarceration and mothers' parenting stress, suggesting that parenting stress cannot mediate the association between paternal incarceration and mothers' neglect and physical aggression.

Table 6 presents the baseline association between paternal incarceration and maternal parenting in model 1 (the equivalent of the kernel matching estimates presented in table 5) and, in each subsequent model, presents estimates that include each of the three sets of mechanisms (excluding parenting stress as a mental health mechanism). The estimates of neglect show that the inclusion of each of the three sets of mechanisms renders the treatment, recent paternal incarceration, statistically insignificant. Though statistically insignificant, the mechanisms explain only a modest portion of the association; relationship characteristics explain 2 percent of the association, economic insecurity explains 17 percent of the association, and mental health explains 15 percent of the association. The estimates of physical aggression tell a similar story, with the proposed mechanisms explaining some of the treatment (39 percent for relationship characteristics, 12 percent for economic insecurity, and 4 percent for mental health).

### ***Estimating Heterogeneity in the Association between Paternal Incarceration and Maternal Parenting***

The estimates presented in table 5 assume that the association between recent paternal incarceration and maternal parenting is similar for all mothers. However, given that these associations may vary by mothers' propensity for sharing a child with a recently incarcerated father, it is necessary to consider heterogeneity in this association. To do this, I generate three balanced propensity score strata, each of which includes mothers who do and do not experience paternal incarceration. Appendix A shows important differences in demographic, socioeconomic, and behavioral differences across strata, with mothers in the lower stratum generally being more advantaged than women in the higher stratum. For example, being foreign-born and having post-secondary education are common among mothers in stratum 1, the stratum for mothers with the lowest propensities for experiencing paternal incarceration. By contrast, having a household income below the poverty line and sharing a child with an impulsive father are common among women in stratum 3.

**Table 6. Propensity Score Matching Estimates of the Association between Recent Paternal Incarceration and Maternal Parenting, with Mechanisms**

	Model 1	Model 2	Model 3	Model 4
	<i>Baseline</i>	<i>+ Relationship characteristics</i>	<i>+ Economic insecurity</i>	<i>+ Mental health</i>
Panel A. Estimating neglect				
Treatment	0.614*	0.603	0.512	0.524
	(0.301)	(0.338)	(0.313)	(0.307)
Mother separated from father		-0.566		
		(0.390)		
Mother relationship quality		-0.203		
		(0.118)		
Mother poverty			0.222	
			(0.316)	
Mother material hardship			0.098	
			(0.056)	
Mother depression				0.616*
				(0.294)
Panel B. Estimating physical aggression				
Treatment	0.153*	0.094	0.135	0.147
	(0.076)	(0.081)	(0.076)	(0.077)
Mother separated from father		0.067		
		(0.103)		
Mother relationship quality		-0.044		
		(0.036)		
Mother poverty			0.111	
			(0.078)	
Mother material hardship			0.016	
			(0.015)	
Mother depression				0.052
				(0.089)

**Note:** Estimates based on kernel matching. Standard errors in parentheses.

\*  $p < .05$  (two-tailed tests)

Table 7 presents results from multilevel models that consider heterogeneity in the association between recent paternal incarceration and maternal parenting. Turning first to estimates of neglect, the level 1 coefficients show that, across all strata, recent paternal incarceration is associated with an increase in neglect. The magnitude of the coefficient is largest and statistically significant in stratum 1, and is statistically insignificant in strata 2 and 3. The level 2 slope demonstrates

**Table 7. Propensity Score Matching Estimates of the Heterogeneous Association between Recent Paternal Incarceration and Maternal Parenting**

	Level 1			Level 2
	Stratum 1	Stratum 2	Stratum 3	Trend
	$p = [0-.05)$	$p = [.05-.15)$	$p = [.15-.79)$	
Mother neglect	1.656** (0.500)	0.277 (0.586)	0.226 (0.395)	-0.680* (0.317)
Mother psychological aggression	0.056 (0.169)	0.200 (0.119)	0.058 (0.093)	-0.012 (0.091)
Mother physical aggression	0.163 (0.185)	0.142 (0.131)	0.236* (0.099)	0.049 (0.098)

**Note:** Propensity scores are estimated with a logistic regression model estimating recent paternal incarceration as a function of pre-incarceration covariates. Neglect is estimated with a negative binomial model, and psychological aggression and physical aggression are estimated with Poisson regression models. Mothers in stratum 1 have the lowest propensity for sharing a child with a recently incarcerated father, and mothers in stratum 3 have the highest propensity for sharing a child with a recently incarcerated father. Standard errors in parentheses.

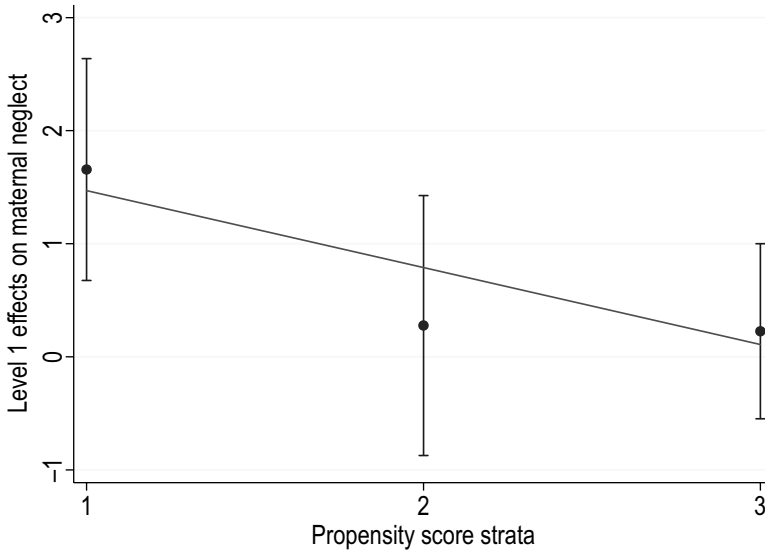
\*\*  $p < .01$  \*\*\*  $p < .001$  (two-tailed tests)

a 0.680-point decrease in neglect for each unit change in stratum. This slope is statistically significant, suggesting that the relationship between recent paternal incarceration and neglect is strongest for mothers with a low propensity for experiencing paternal incarceration. (See figure 1 for a visual depiction of these relationships.) The level 2 slopes for psychological aggression and physical aggression are not statistically significant, suggesting these associations are consistent across all strata.

## Discussion

The rapid rise and unequal distribution of mass incarceration may have implications not only for increased inequality among American men (e.g., Wakefield and Uggen 2010) but also for increased inequality among American families. In this manuscript, I draw on family stress process theory, extending it to consider paternal incarceration as a stressor, to consider both the average and heterogeneous associations between recent paternal incarceration, incarceration that occurred in approximately the past two years, and maternal neglect and harsh parenting, outcomes that are especially important for child well-being (Bodovski and Youn 2010; Hildyard and Wolfe 2002; Kotch et al. 2008; Taylor et al. 2010; Whitaker et al. 2007). In addition to extending family stress process theory, this manuscript links two parallel literatures, one about the consequences of incarceration for family life and another about the social processes associated with maternal parenting, and provides one of the first systematic accountings of heterogeneity in the relationship between paternal incarceration and family life.

**Figure 1. Heterogeneous treatment association between recent paternal incarceration and maternal neglect**



Results show that, indeed, incarceration is a stressor to the family system. For parents living together prior to paternal incarceration, this confinement is modestly and positively associated with two aspects of mothers' parenting: neglect and physical aggression. These associations persist across a host of specifications of the propensity score. This provides evidence that paternal incarceration impedes mothers' relationships with their children, an argument often proposed as an explanation for the negative relationship between paternal incarceration and child well-being (Geller et al. 2012; Wildeman 2010) but rarely tested. These findings are also in line with other research suggesting that fathers play an important role in maternal parenting (Guterman et al. 2009).

Additionally, results show that incarceration triggers relationship characteristics (Comfort 2008; Massoglia, Remster, and King 2011), family economic insecurity (Western 2002), and depression among mothers (Wildeman, Schnittker, and Turney 2012), all of which, to some extent, mediate the association between parental incarceration and maternal parenting. Some of the association between paternal incarceration and maternal neglect stems from resultant economic insecurity and depression, and about 40 percent of the association between paternal incarceration and maternal physical aggression is explained by relationship characteristics including separation and relationship quality. This former point is consistent with research documenting that the deleterious consequences of incarceration for paternal parenting are explained almost entirely by post-incarceration changes in the parental relationship (Turney and Wildeman 2013).

In contrast to the positive average link between paternal incarceration and maternal neglect and physical aggression, incarceration's associations with

psychological aggression result from social selection forces. Descriptive statistics show that mothers who share children with recently incarcerated fathers report more psychological aggression than their counterparts, but these statistically significant associations disappear after matching on observed characteristics. Therefore, despite persuasive reasons suggesting that paternal incarceration, on average, is predictive of maternal psychological aggression, these observed associations are a function of other differences between mothers who do and do not share a child with recently incarcerated fathers. Given the large demographic, socioeconomic, and behavioral differences between these groups, this is consistent with broader arguments about selection (e.g., Giordano 2010; Sampson 2011). It may be that the stresses associated with paternal incarceration are less independently consequential for emotional aspects of parenting such as psychological aggression (e.g., calling a child dumb or lazy).

Investigating only the average associations of paternal incarceration overlooks the possibility that there may be heterogeneity in the consequences of incarceration for maternal parenting. Multilevel propensity score models provide some evidence of this, as the positive association between paternal incarceration and neglect increases as mothers' propensity scores—their likelihood of sharing a child with a recently incarcerated father—decrease. The concentration of positive associations among mothers with a low propensity for experiencing paternal incarceration provides evidence that paternal incarceration is an event stressor, a stressful life event that is sudden and unexpected (Eaton 1978; Wheaton 1982). For *relatively* advantaged mothers, who are not anticipating the incarceration of a child's father, incarceration is associated with greater neglect. Taken together, these heterogeneous associations are in line with findings from qualitative research demonstrating heterogeneity in the effects of incarceration for families (Comfort 2008; Edin, Nelson, and Paranal 2004; Nurse 2002; Turanovic, Rodriguez, and Pratt 2012), and from quantitative research that finds that incarceration is most deleterious for more advantaged families. Turney and Wildeman (2013) find, for example, that the effects of incarceration are concentrated among parents living together prior to incarceration. Importantly, though, heterogeneous associations are found only for maternal neglect. Across propensity score stratum, incarceration is equally unharmed for psychological aggression and equally harmful for physical aggression.<sup>5</sup>

### **Limitations**

Despite the strengths of this study, there are many opportunities for additional research on this topic. For one, propensity score models, though a useful framework for considering both average and heterogeneous treatment effects, are limited because they do not adjust for all possible characteristics associated with selection into incarceration, a problem inherent in nearly all social science research. I take several steps to minimize unobserved heterogeneity, such as including a wide array of covariates in generating the propensity score and conducting falsification tests. The analyses of heterogeneous associations also lend some assurance that the observed associations do not result from social selection

processes, as they provide no evidence that the associations are concentrated among the most disadvantaged mothers (which we would expect if a spurious relationship exists). But a spurious relationship cannot be ruled out, and future research should continue to investigate the causal relationship between paternal incarceration and maternal parenting. Additionally, future research should continue to investigate the heterogeneity in incarceration's effects on family life, as well as the potentially curvilinear heterogeneous association, because these heterogeneous associations are considered preliminary and because the strata cut points chosen are necessarily arbitrary.

Other limitations regarding variable measurement exist. First, the alpha coefficients for all three indicators of maternal parenting are low. The low alphas may result partially from the dichotomous individual measures (though Kuder-Richardson coefficients of reliability, which are well suited for dichotomous measures, produced similar results) or may signal that the individual items are not measuring the same construct (though factor analysis suggests that this is not the case). Though these alpha coefficients are consistent with prior research using established CTSPC scales (Guterman et al. 2009; Straus et al. 1998), it is imperative that future research consider additional measures of parenting (e.g., communication, monitoring). Also related to the dependent variables, it is possible that mothers underreport their neglect and harsh parenting, though there is no reason to believe that mothers who do and do not share a child with recently incarcerated fathers would differentially report socially desirable responses or that differential reporting would occur across propensity score strata.

With respect to the key independent variable, recent paternal incarceration, this measure does not distinguish between duration and type of incarceration (prison versus jail), both of which may have implications for maternal parenting. Incarceration lasting many months may mean that mothers are solely responsible for parenting responsibilities, or that they exhaust their support networks, and, thus, this extended incarceration may be more detrimental than a short stint behind bars. Alternatively, lengthy incarcerations may allow mothers the possibility of repartnership (Bzostek, McLanahan, and Carlson 2012). Understanding this potentially important variation in incarceration experiences, as well as its consequences for family life, is a crucial mission for future data-collection efforts.

## Conclusion

Taken together, these findings add to a growing body of literature on the consequences of paternal incarceration for family life. By documenting how and under what conditions the collateral consequences of incarceration extend beyond the offender, and spill over to women connected to offenders, this research highlights the unintended consequences of paternal incarceration for families. It provides the first quantitative examination of the consequences of paternal incarceration for maternal parenting (though see Jones [2013]) and provides, more generally, some of the first quantitative evidence that incarceration has heterogeneous effects on family life (though see Dyer, Pleck, and McBride [2012]; Turney and



Wildeman [2013]). Findings are also important from a social policy perspective. Understanding both average and heterogeneous effects of paternal incarceration provides guidance on how to target interventions to make them more effective for families. Furthermore, these results suggest that incarceration—given its concentration among disadvantaged families and, at least in one domain, its most consequential effects for the most advantaged of these disadvantaged families—has complicated and countervailing implications for inequalities in family life.

## Notes

1. Indicators of chronicity—as opposed to prevalence—are available. In supplemental analyses, I estimate the association between recent paternal incarceration and chronicity of maternal neglect and harsh parenting, by assigning weights to values in accordance with the frequencies indicated by the response categories (0 = *this has never happened or this has happened before, but not in the past year*; 1 = *once*; 2 = *twice*; 4 = *three to five times*; 8 = *six to 10 times*; 15 = *11 to 20 times*; 25 = *more than 20 times*). When this alternative measurement strategy is used, point estimates are larger in magnitude and statistical significance. Because prevalence measures are preferred to those measures of chronicity (Straus 2001), I use prevalence measures in the analyses presented.
2. Another way to operationalize these dependent variables is to create scales derived from factor analysis, and, in supplemental analyses, I considered this possibility. Both a principal components factor analysis and a parallel analysis revealed that the individual items comprising neglect and physical aggression loaded onto the same factor. But with respect to psychological aggression, these analyses suggest that the individual items load onto two factors. However, because the internal consistency of the two scales derived from this factor analysis was lower than the internal consistency when all five are included in the same scale, I use a single measure that includes all items. Supplemental analyses that substitute the count variables for the factor variables (including the one-factor variable for neglect, the two-factor variables for psychological aggression, and the one-factor variable for physical aggression) produce similar results as those presented.
3. Using three strata allows for similar numbers of observations in each stratum and for natural cut points of the propensity scores (e.g., Brand and Xie 2010; Xie, Brand, and Jann 2012).
4. Not all variables used to generate the average propensity score could be included in the propensity score models estimating heterogeneous treatment associations, because their inclusion precluded the achievement of within-stratum balance. These variables are instead included as controls in the models estimating maternal parenting. Additionally, to better achieve balance across strata, these models also include mother's age squared, mother's number of children squared, and father's impulsivity squared.
5. Given the established race/ethnic differences in parenting (e.g., Chedle and Amato 2011), as well as the unequal distribution of incarceration across race/ethnic groups (Wakefield and Uggen 2010), one possibility is that race/ethnic variation in the association between paternal incarceration and maternal neglect is driving the heterogeneous associations. Supplemental analyses that considered the associations between paternal incarceration and maternal parenting separately for each race/ethnic group show no evidence that these associations vary by race/ethnicity.

### Appendix A. Means of Covariates by Recent Paternal Incarceration and Propensity Score Strata

	Stratum 1		Stratum 2		Stratum 3	
	$p = [0-.05)$		$p = [.05-.15)$		$p = [.15-.79)$	
	$E(X)   d = 1$	$E(X)   d = 0$	$E(X)   d = 1$	$E(X)   d = 0$	$E(X)   d = 1$	$E(X)   d = 0$
Mother race						
Non-Hispanic White	0.278	0.448	0.242	0.149	0.128	0.188
Non-Hispanic Black	0.111	0.187	0.485	0.507	0.641	0.563
Hispanic	0.556	0.302	0.242	0.324	0.205	0.229
Non-Hispanic other race	0.055	0.063	0.031	0.020	0.026	0.020
Mother foreign-born	0.278	0.325	0.061	0.092	0.026	0.026
Mother lived with both biological parents at age 15	0.722	0.757	0.303	0.338	0.167	0.198
Mother age	31.889	33.115	25.121	26.635	24.987	24.286
Mother number of children in household	2.389	2.180	2.121	2.486	2.577	2.401
Mother education						
Less than high school	0.222	0.130	0.242	0.275	0.462	0.469
High school diploma or GED	0.111	0.189	0.364	0.287	0.231	0.214
Post-secondary education	0.667	0.681	0.394	0.437	0.308	0.318
Mother stable employment	0.333	0.445	0.424	0.401	0.256	0.229
Mother poverty	0.278	0.129	0.212	0.353	0.641	0.599
Mother ever incarcerated	0.000	0.000	0.000	0.002	0.115	0.063
Father impulsivity	1.736	1.775	1.969	2.001	2.420	2.314
Father engaged in domestic violence	0.000	0.000	0.000	0.014	0.256	0.167
N	18	705	33	414	78	192

**Note:**  $E(X) | d = 0$  indicates means for those who did not experience recent paternal incarceration.  $E(X) | d = 1$  indicates means for those who did experience recent paternal incarceration. Mothers in stratum 1 have the lowest propensity for sharing a child with a recently incarcerated father, and mothers in stratum 3 have the highest propensity for sharing a child with a recently incarcerated father.

### About the Author

Kristin Turney is an Assistant Professor of Sociology at the University of California–Irvine. Her research investigates the complex, dynamic role of families in creating and exacerbating social inequalities. Specifically, her research considers the collateral consequences of incarceration for family life, the effects of depression on individuals and children, and the causes and consequences of childhood health inequalities. These substantive interests are accompanied with a methodological interest in causal inference.

## References

- Alexander, Michelle. 2010. *Mass Incarceration in the Age of Colorblindness*. New York: New Press.
- Arditti, Joyce A. 2012. *Parental Incarceration and the Family: Psychological and Social Effects of Imprisonment on Children, Parents, and Caregivers*. New York: New York University Press.
- Beck, Audrey, Carey Cooper, Sara McLanahan, and Jeanne Brooks-Gunn. 2010. "Partnership Transitions and Maternal Parenting." *Journal of Marriage and Family* 72:219–33.
- Bendheim-Thoman Center for Research on Child Wellbeing. 2009. "Five-Year In-Home Longitudinal Study of Preschool Aged Children." Princeton, NJ: Office of Population Research, Princeton University.
- Bodovski, Katerina, and Min-Jong Youn. 2010. "Love, Discipline, and Elementary School Achievement: The Role of Family Emotional Climate." *Social Science Research* 39:585–95.
- Braman, Donald. 2004. *Doing Time on the Outside: Incarceration and Family Life in Urban America*. Ann Arbor: University of Michigan Press.
- Brand, Jennie E. 2010. "Civic Returns to Higher Education: A Note on Heterogeneous Effects." *Social Forces* 89:417–33.
- Brand, Jennie E., and Yu Xie. 2010. "Who Benefits Most from College? Evidence for Negative Selection in Heterogeneous Economic Returns to Higher Education." *American Sociological Review* 75:273–302.
- Buss, Arnold, and Robert Plomin. 1984. *Temperament: Early Developing Personality Traits*. Hillsdale, NJ: Erlbaum.
- Bzostek, Sharon, Sara McLanahan, and Marcia J. Carlson. 2012. "Mothers Repartnering after a Nonmarital Birth." *Social Forces* 90:817–41.
- Cheadle, Jacob E., and Paul R. Amato. 2011. "A Quantitative Assessment of Lareau's Qualitative Conclusions about Race, Class, and Parenting." *Journal of Family Issues* 32:679–706.
- Chung, Yiyoon. 2012. "The Effects of Paternal Imprisonment on Children's Economic Well-Being." *Social Service Review* 86:455–86.
- Comfort, Megan. 2008. *Doing Time Together: Love and Family in the Shadow of the Prison*. Chicago: University of Chicago.
- Conger, Rand D., Glen H. Elder Jr., Frederick O. Lorenz, Katherine J. Conger, Ronald L. Simons, Les B. Whitbeck, Shirley Huck, and Janet N. Melby. 1990. "Linking Economic Hardship to Marital Quality and Instability." *Journal of Marriage and Family* 52:643–56.
- Daniel, Sally W., and Carol J. Barrett. 1981. "The Needs of Prisoners' Wives: A Challenge for the Mental Health Professions." *Community Mental Health Journal* 17:310–22.
- Dickman, Scott J. 1990. "Functional and Dysfunctional Impulsivity: Personality and Cognitive Correlates." *Journal of Personality and Social Psychology* 58:95–102.
- DiPrete, Thomas A., and Gregory M. Eirich. 2006. "Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments." *Annual Review of Sociology* 32:271–97.
- Dyer, W. Justin, Joseph Pleck, and Brent McBride. 2012. "Using Mixture Regression to Identify Varying Effects: A Demonstration with Paternal Incarceration." *Journal of Marriage and Family* 74:1129–48.
- Eaton, William W. 1978. "Life Events, Social Supports, and Psychiatric Symptoms: A Re-Analysis of the New Haven Data." *Journal of Health and Social Behavior* 19:230–34.
- Edin, Kathryn, Timothy J. Nelson, and Rechelle Paranal. 2004. "Fatherhood and Incarceration as Potential Turning Points in the Criminal Careers of Unskilled Men." In *Imprisoning America: The Social Effects of Mass Incarceration*, edited by M. Patillo, D. Weiman, and B. Western, 46–75. New York: Russell Sage Foundation.
- Elder, Glen H. Jr., Monica Kirkpatrick Johnson, and Robert Crosnoe. 2003. "The Emergence and Development of Life Course Theory." In *Handbook of the Life Course*, edited by J. Mortimer and M. Shanahan, 3–19. New York: Kluwer Academic/Plenum Publishers.
- Entwisle, Doris R., and Karl L. Alexander. 1989. "Early Schooling as a 'Critical Period' Phenomenon." In *Sociology of Education and Socialization*, vol. 8, edited by K. Namboodiri and R. G. Corwin, 27–55. Greenwich, CT: JAI Press.

- Fishman, Laura T. 1990. *Women at the Wall: A Study of Prisoners' Wives Doing Time on the Outside*. Albany: State University of New York Press.
- Geller, Amanda, Carey E. Cooper, Irwin Garfinkel, Ofira Schwartz-Soicher, and Ronald B. Mincy. 2012. "Beyond Absenteeism: Father Incarceration and Its Effects on Children's Development." *Demography* 49:49–76.
- Geller, Amanda, Irwin Garfinkel, and Bruce Western. 2011. "Paternal Incarceration and Support for Children in Fragile Families." *Demography* 48:25–47.
- Giordano, Peggy C. 2010. *Legacies of Crime: A Follow-Up of the Children of Highly Delinquent Girls and Boys*. New York: Cambridge University Press.
- Glaze, Lauren E. 2011. "Correctional Populations in the United States, 2010." Washington, DC: US Department of Justice.
- Goffman, Alice. 2009. "On the Run: Wanted Men in a Philadelphia Ghetto." *American Sociological Review* 74:339–57.
- Guterman, Neil, Yookyong Lee, Shawna Lee, Jane Waldfogel, and Paul Rathouz. 2009. "Fathers and Maternal Risk for Physical Child Abuse." *Child Maltreatment* 14:277–90.
- Hildyard, Kathryn L., and David A. Wolfe. 2002. "Child Neglect: Developmental Issues and Outcomes." *Child Abuse and Neglect* 26:679–95.
- Jann, Ben, Jennie E. Brand, and Yu Xie. 2007. "HTE: Stata Module to Perform Heterogeneous Treatment Effect Analysis." Statistical Software Components S457129, Boston College Department of Economics.
- Jones, Jerrett. 2013. "Examining the Relationship between Paternal Incarceration, Maternal Stress, and Harsh Parenting Behaviors." Fragile Families Working Paper WP13-03-FF.
- Kessler, Ronald C., Gavin Andrews, Daniel Mroczek, Bedirhan Ustun, and Hans-Ulrich Wittchen. 1998. "The World Health Organization Composite International Diagnostic Interview Short Form (CIDI SF)." *International Journal of Methods in Psychiatric Research* 7:171–85.
- Kotch, Jonathan B., Terri Lewis, Jon M. Hussey, Diana English, Richard Thompson, Alan J. Litrownik, Desmond K. Runyan, Shrikant I. Bangdiwala, Benyamin Margolis, and Howard Dubowitz. 2008. "Importance of Early Neglect for Childhood Aggression." *Pediatrics* 121:725–31.
- Lopoo, Leonard M., and Bruce Western. 2005. "Incarceration and the Formation and Stability of Marital Unions." *Journal of Marriage and Family* 67:721–34.
- Lovejoy, M. Christine, Patricia A. Graczyk, Elizabeth O'Hare, and George Neuman. 2000. "Maternal Depression and Parenting Behavior: A Meta-Analytic Review." *Clinical Psychology Review* 20:561–92.
- Massoglia, Michael. 2008. "Incarceration as Exposure: The Prison, Infectious Disease, and Other Stress-Related Illnesses." *Journal of Health and Social Behavior* 49:56–71.
- Massoglia, Michael, Brianna Remster, and Ryan D. King. 2011. "Stigma or Separation? Understanding the Incarceration-Divorce Relationship." *Social Forces* 90:133–55.
- Morgan, Stephen L., and David J. Harding. 2006. "Matching Estimators of Causal Effects: Prospects and Pitfalls in Theory and Practice." *Sociological Methods and Research* 35:3–60.
- Mumola, Christopher J. 2000. *Incarcerated Parents and Their Children. Bureau of Justice Statistics Special Report*. Washington, DC: US Department of Justice.
- Musick, Kelly, Jennie E. Brand, and Dwight Davis. 2012. "Variation in the Relationship Between Education and Marriage: Marriage Market Mismatch?" *Journal of Marriage and Family* 74:53–69.
- Nurse, Ann M. 2002. *Fatherhood Arrested: Parenting from Within the Juvenile Justice System*. Nashville, TN: Vanderbilt University Press.
- Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology* 108:937–75.
- Pearlin, Leonard I. 1989. "The Sociological Study of Stress." *Journal of Health and Social Behavior* 30:241–56.
- Reichman, Nancy E., Julien O. Teitler, Irwin Garfinkel, and Sara S. McLanahan. 2001. "Fragile Families: Sample and Design." *Children and Youth Services Review* 23:303–26.

- Rosenbaum, Paul R., and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70:41–55.
- Rubin, Donald B. 1987. *Multiple Imputation for Nonresponse in Surveys*. Hoboken, NJ: John Wiley and Sons.
- Sampson, Robert J. 2011. "The Incarceration Ledger: Toward a New Era in Assessing Societal Consequences." *Criminology & Public Policy* 10:819–28.
- Schafer, Markus H., Lindsay R. Wilkinson, and Kenneth F. Ferraro. 2013. "Childhood (Mis) Fortune, Educational Attainment, and Adult Health: Contingent Benefits of a College Degree?" *Social Forces* 91:1007–34.
- Schnittker, Jason, and Andrea John. 2007. "Enduring Stigma: the Long-Term Effects of Incarceration on Health." *Journal of Health and Social Behavior* 48:115–30.
- Schwartz-Soicher, Ofira, Amanda Geller, and Irwin Garfinkel. 2011. "The Effect of Paternal Incarceration on Material Hardship." *Social Service Review* 85:447–73.
- Slack, Kristen Shook, Jane L. Holl, Marla McDaniel, Joan Yoo, and Kerry Bolger. 2004. "Understanding the Risks of Child Neglect: An Exploration of Poverty and Parenting Characteristics." *Child Maltreatment* 9:395–408.
- Straus, Murray A. 2001. *Scoring and Norms for the CTS2 and CTSPC Family Research Laboratory*. University of New Hampshire.
- Straus, Murray A., Sherry L. Hamby, David Finkelhor, David D. Moore, and Desmond Runyan. 1998. "Identification of Child Maltreatment with the Parent-Child Conflict Tactics Scales: Development and Psychometric Data for a National Sample of American Parents." *Child Abuse and Neglect* 22:249–70.
- Sugie, Naomi F. 2012. "Punishment and Welfare: Paternal Incarceration and Families' Receipt of Public Assistance." *Social Forces* 90:1403–27.
- Taylor, Catherine A., Jennifer Manganello, Shawna J. Lee, and Janet C. Rice. 2010. "Mothers' Spanking of 3-Year-Old Children and Subsequent Risk of Children's Aggressive Behavior." *Pediatrics* 125:e1057–65.
- Turanovic, Jillian J., Nancy Rodriguez, and Travis C. Pratt. 2012. "The Collateral Consequences of Incarceration Revisited: A Qualitative Analysis of the Effects of Caregivers of Children of Incarcerated Parents." *Criminology* 50:913–59.
- Turney, Kristin. 2011. "Labored Love: Examining the Link Between Depression and Parenting Behaviors among Mothers." *Social Science Research* 40:399–415.
- Turney, Kristin, Jason Schnittker, and Christopher Wildeman. 2012. "Those They Leave Behind: Paternal Incarceration and Maternal Instrumental Support." *Journal of Marriage and Family* 74:1149–65.
- Turney, Kristin, and Christopher Wildeman. 2013. "Redefining Relationships: Explaining the Countervailing Consequences of Paternal Incarceration for Parenting." *American Sociological Review* 78:949–79.
- Turney, Kristin, Christopher Wildeman, and Jason Schnittker. 2012. "As Fathers and Felons: Explaining the Effects of Current and Recent Incarceration on Major Depression." *Journal of Health and Social Behavior* 53:465–81.
- Uggen, Christopher, and Jeff Manza. 2002. "Democratic Contraction? Political Consequences of Felon Disenfranchisement in the United States." *American Sociological Review* 67:777–803.
- Wakefield, Sara, and Christopher Uggen. 2010. "Incarceration and Stratification." *Annual Review of Sociology* 36:387–406.
- Western, Bruce. 2002. "The Impact of Incarceration on Wage Mobility and Inequality." *American Sociological Review* 67:526–46.
- Wheaton, Blair. 1982. "A Comparison of the Moderating Effects of Personal Coping Resources on the Impact of Exposure to Stress in Two Groups." *Journal of Community Psychology* 10:293–311.
- Whitaker, Robert C., Shannon M. Phillips, Sean M. Orzol, and Hillary L. Burdette. 2007. "The Association between Maltreatment and Obesity among Preschool Children." *Child Abuse and Neglect* 31:1187–99.

- Wildeman, Christopher. 2010. "Paternal Incarceration and Children's Physically Aggressive Behaviors: Evidence from the Fragile Families and Child Wellbeing Study." *Social Forces* 89:285–309.
- \_\_\_\_\_. 2012. "Imprisonment and Infant Mortality." *Social Problems* 59:228–57.
- Wildeman, Christopher, and Christopher Muller. 2012. "Mass Imprisonment and Inequality in Health and Family Life." *Annual Review of Law and Social Science* 8:11–30.
- Wildeman, Christopher, Jason Schnittker, and Kristin Turney. 2012. "Despair by Association? The Mental Health of Mothers with Children by Recently Incarcerated Fathers." *American Sociological Review* 77:216–43.
- Xie, Yu, Jennie E. Brand, and Ben Jann. 2012. "Estimating Heterogeneous Treatment Effects with Observational Data." *Sociological Methodology* 42:314–47.