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ABSTRACT

Objectives. The transition to adulthood can be challenging, especially for children of incarcerated parents. Drawing on reentry and life-course scholarship, we argue that parental incarceration may adversely affect multiple life outcomes for children as they progress from adolescence into adulthood and that such effects may persist from early young adulthood into late young adulthood.

Methods. The study uses propensity score matching analyses of National Longitudinal Study of Adolescent Health (Add Health) data (N = 12,844).

Results. Analyses identified harmful effects of parental incarceration on many life domains, including criminal behavior, mental health, illegal drug use, education, earnings, and intimate relationships. These effects typically surfaced by early young adulthood and continued into late young adulthood.

Conclusions. The results suggest that parental incarceration constitutes a significant turning point in the lives of young people and underscore the importance of life-course perspectives for understanding incarceration effects. They also illustrate that formal punishment policies may create harms that potentially offset intended benefits.

KEYWORDS: parental incarceration, young adults, life-course, outcomes

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INTRODUCTION

National estimates indicate that over half of prisoners—52 percent of state inmates and 63 percent of federal inmates—are parents of children who are 17 or younger; these children comprise roughly 2.3 percent of the population of individuals under age 18 in the United States (Glaze and Maruschak 2008:1). Millions of additional children have had a parent incarcerated at some point in time. This situation raises the concern that mass incarceration inadvertently may contribute to large-scale social problems and disadvantages for new generations of youth (Petersilia 2003; Travis 2005; Wildeman 2009; van de Rakt et al. 2012). Recent scholarship has identified immediate psychological, social, and economic harms of parental incarceration to young children, and suggests that these harms may persist over time (Chung 2012; Turney et al. 2012; Wakefield and Wildeman 2014; Uggen and McElrath 2014). The possibility of potentially lasting harms raises concerns about children's longer-term social development (Foster and Hagan 2007). Because the foundations for successful adult adjustment are laid earlier in life, parental incarceration could have disruptive effects on children during and after their transition to adulthood (Osgood et al. 2005; Murray and Murray 2010; Swartz et al. 2011; Arditti 2012).

Against this backdrop, this paper seeks to contribute to efforts to understand the effects of parental incarceration on transitions into adulthood and, more generally, the potential for it to exact penalties that extend across the life-course. In particular, it builds on recent studies of parental incarceration that have focused primarily on children and adolescents and turns the attention to outcomes for older youth observed during early young adulthood and later young adulthood. We draw on and contribute to several lines of scholarship, including research on mass incarceration and reentry, which emphasizes the potential for imprisonment to harm children, and life-course studies, which highlight the salience of parental incarceration as a turning point for children that can diminish later life prospects. These interrelated literatures and the theoretical grounds for anticipating that parental incarceration may affect children during the

transition to adulthood are discussed. We hypothesize that parental incarceration may have lasting adverse effects for children in early young adulthood and in later young adulthood. Propensity score matching analyses of data from the National Longitudinal Study of Adolescent Health (Add Health) lend support to this hypothesis. They identify harmful effects of parental incarceration across multiple life domains—including criminal offending, mental health, illegal drug use, education, earnings, and intimate relationships—that endure throughout and after the transition into adulthood. Implications of these findings for scholarship and policy are discussed.

BACKGROUND

Mass Incarceration and Reentry Perspectives on Parental Incarceration Effects

Over the past three decades, prison populations grew from roughly 500,000 inmates to over 2 million, mirroring dramatic and historically unprecedented increases in incarceration rates nationally (Glaze and Parks 2012). Concomitantly, expenditures on corrections more than tripled, from approximately $15 billion to $53 billion annually, adjusted for inflation (Kyckelhahn 2010). A large and robust literature has emerged that has examined the causes of this policy shift. Scholars, for example, have emphasized the salience of the War on Drugs, racialized depictions of crime, and a turn towards more politically conservative governance models (see, e.g., Gottschalk 2006; Western 2006; Garland 2013). At the same time, scholarship has turned towards examining the implications and effects of mass incarceration.

One line of work highlights the potential harms of mass incarceration. Reviews of research on the effects of prison on recidivism, for example, paint a pessimistic picture. Although some studies find that incarceration is associated with decreased offending, others find no effect or a harmful effect (Nagin et al. 2009; Cochran et al. 2014). The largest recidivism study to date, undertaken by the Bureau of Justice Statistics, appears to reinforce the latter assessment; it found that, among prisoners from 30 states in 2005, 77 percent were rearrested within five years of release (Durose et al. 2014). Other work suggests that mass incarceration may increase crime in

prisoners' communities of origin, even beyond its effects on recidivism among the prisoners themselves (Clear 2007). Incarceration also may result in other collateral consequences that may offset any potential benefits. For example, it may adversely affect the ability of ex-prisoners to secure gainful employment, it may contribute to homelessness or difficulty in finding housing with their families, and it may contribute to drug abuse and mental and physical health problems (Petersilia 2003; Travis 2005; Raphael and Stoll 2009; Western 2006).

Collateral consequences of incarceration can extend well beyond effects on those who go to and leave prison. They may extend to families and, in particular, to children (Wildeman 2009; Wakefield and Wildeman 2011; Murray et al. 2012; Turney 2014). As Hagan and Dinovitzer (1999:121) have argued, collateral consequences "may be especially consequential for children of imprisoned parents who are already at risk of growing up and coming of age in disadvantaged communities." Although initial studies identified behavioral, health, educational, and social problems among children of incarcerated parents, the study designs "suffered from the lack of longitudinal data as well as from the use of biased samples" (Wakefield and Wildeman 2009:794; see also Johnston 2006; Murray and Farrington 2008). This situation has changed somewhat in recent years, with newer studies employing more rigorous statistical methodologies, including growth curve modeling and propensity score matching, and examining outcomes prospectively. Results from these studies have continued to indicate that young children of incarcerated parents have more conduct problems, worse physical and mental health, and more learning, speech, and developmental problems (Wakefield and Wildeman 2009; Murray et al. 2012; Turney 2014; see also Turney and Wildeman 2015). Collectively, the studies indicate that parental incarceration may adversely affect children along multiple life domains. Even so, recent work by Porter and King (2015) suggests that paternal incarceration in fact may exert a limited effect, if any, on delinquency outcomes among adolescents.

Because of its emphasis on the prison experience and its immediate aftermath, work in the mass incarceration and reentry tradition tends to highlight the short-term effects of parental incarceration. Such work suggests that it affects children by undermining parents' reputations

and social standing, ability to contribute economically to the household, and social contact, relationships, and bonds with children (Nurse 2002; Braman 2004; Comfort 2008; Wildeman 2009; Geller 2013; Uggen and McElrath 2014; Johnson and Easterling 2015). The social, economic, and emotional effects of parental incarceration may adversely affect child social capital through increased strain on the child and family, reduced supervision, and stigmatization (Hagan and Dinovitzer 1999; McLanahan and Sandefur 1994; Porter and King 2015). Following incarceration, ex-prisoners typically face stigma and difficulty finding employment, securing housing, obtaining drug or mental health treatment, and resuming contact with children, partners, or spouses (Petersilia 2003; Huebner 2005; Travis 2005; Western 2006). These challenges can impede the ability of former inmates to fulfill important parental functions and, concomitantly, create problems for families that increase their children's risk of poor psychosocial development.

What is not yet known is the extent to which parental incarceration affects children across multiple life domains as they enter into adulthood. The mechanisms behind its effects typically are ascribed to problems with caregiving for younger children (e.g., child-rearing and support, household instability). Yet, such mechanisms may become less relevant once children reach the age of majority. Even so, parental incarceration's effects on young children's educational performance, behavior, and mental health may create a poor foundation for negotiating adolescence and the challenges of becoming independent and assuming adult responsibilities. In addition, the experience of incarceration may undermine parents' ability to play important emotional and instrumental roles during children's transitions to adulthood (Osgood et al. 2005; Murray and Murray 2010; Swartz et al. 2011; Arditti 2012). As discussed below, life-course scholarship anticipates precisely such a possibility.

Life-Course Perspectives on Parental Incarceration Effects

Strain, socialization, and stigmatization theories have been used to anticipate and explain how parental incarceration may adversely affect child development and behavior (see, e.g.,

Hagan and Dinovitzer 1999; Murray et al. 2012). Life-course scholarship offers a complementary perspective of particular relevance for understanding how parental incarceration may have collateral consequences for children because it draws attention to the way that development unfolds prospectively and cumulatively. Strong family support typically provides a critical foundation from which children achieve developmental milestones and psychosocial maturity. Successful transitions to adulthood include, in part, developing (1) mastery and competence in understanding how to participate in prosocial ways in societal activities, including work and recreation, (2) interpersonal skills necessary for creating and maintaining intimate relationships with others and appropriate interactions with others at work, school, and other settings, and (3) a positive self-definition and an ability to self-govern in ways that create a sense of self-worth and contribute to achieving personal goals (Chung et al. 2005; see, generally, Bronfenbrenner 1979; Mortimer and Shanahan 2003; Osgood et al. 2005; Elder and Giele 2009).

Life-course theories highlight the salience of "turning points," such as divorce and military service. A turning point constitutes "an alteration or deflection in a long-term pathway or trajectory that was initiated at an earlier point in time" (Sampson and Laub 2005:16). Although many life events require people to adapt temporarily, the events become turning points when they spark discontinuities in prior adjustment that then persist or are amplified through dynamic processes of accumulating and self-reinforcing consequences (Sampson and Laub 1997; Mortimer and Shanahan 2003; Elder and Giele 2009). These events often have two features: They cause marked changes in contexts or circumstances, and they create or close off opportunities for achievement, social networks and relationships, and new self-concepts (Rutter 1996). Criminal justice system involvement has many of these qualities, as it can create or amplify social and economic marginalization of families and, for ex-prisoners, can result in collateral effects on opportunities for their relationships with their families as well as access to housing, employment, and treatment, and services (Petersilia 2003; Travis 2005).

Viewed from a life-course theoretical perspective, then, parental incarceration constitutes a turning point for children if it creates disruptions in their social, psychological, and emotional

development as they transition into adulthood (Foster and Hagan 2007). Evidence to date suggests that youths' own offending, arrest, and incarceration can result in long-term effects on later educational attainment (Tanner et al. 1999), income (Kerley et al. 2004), and mental health (Hagan 1997). However, the long-term effects of parental incarceration on children remain largely unknown. On the one hand, children may view entry into adulthood as an opportunity for them to differentiate themselves from their stigmatized parents and to redirect maladaptive behavioral, psychological, and social trajectories (Giordano 2010). On the other hand, experiencing a parent's incarceration during formative years of development could leave these children socially isolated, exposed to family instability, and without the skills, resources, and foundations needed for successful adjustment in adulthood (Sampson and Laub 2005; Foster and Hagan 2007; Uggen and McElrath 2014; Johnson and Easterling 2015). In this way, parental incarceration could resemble other disruptive family events like parental divorce. Even as young adults, children from divorced households have lower socioeconomic attainment, lower-quality romantic relationships, and lower subjective well-being than do children from intact families (Amato 1999). Parental incarceration, too, could adversely affect children during and after the transition to adulthood by impeding parents' ability to provide resources, support, and social capital to enable grown children to complete school, regain emotional and physical health, find employment, and negotiate such crises as unemployment, divorce, or homelessness (Swartz 2009; Arditti 2012; Johnson and Benson 2012; Siennick 2014; Uggen and McElrath 2014).

The few empirical studies that have followed children of incarcerated parents into young adulthood provide suggestive evidence that parental incarceration may exert long-term effects on children's wellbeing. Analyses of data from the Cambridge Study in Delinquent Development, as well as the Dutch Criminal Career and Life Course Study, have linked parental incarceration with adult convictions and criminal records among offspring (Murray et al. 2007; Besemer et al. 2011; van de Rakt et al. 2012). For example, Murray and Farrington (2005; 2008) found that the 23 boys in the Cambridge study who experienced parental incarceration before age 10 had more internalizing and antisocial problems at midlife than did other boys. Two other studies suggest

the potential for such long-term effects. Roettger and colleagues (2010) linked fathers' incarcerations with higher levels of children's marijuana and other drug use throughout adolescence and into the early twenties. And Foster and Hagan (2007) found that young adult children of incarcerated fathers had higher rates of homelessness and political disengagement.

In short, studies to date suggest the potential for parental incarceration to constitute a significant turning point in the lives of children, one that may exact penalties upon these children as they progress into adulthood. Research has yet to establish, however, whether it indeed exerts such an effect across multiple life domains, as would be anticipated from life-course scholarship, both during and after the transition to adulthood. To the extent that parental incarceration is a turning point for children, we can anticipate that adverse effects across varied life domains will arise—relative to what children of non-incarcerated parents experience—and that the effects may become more pronounced over time. These effects include the potential for increased offending, educational failure, drug use, physical and mental health problems, unemployment or poor earnings, and romantic relationship problems (Hagan and Dinovitzer 1999; Osgood et al. 2005; Giordano 2010; Turney 2014). What is needed, then, are studies that investigate whether parental incarceration in fact constitutes a turning point that influences children as they progress into adulthood and, as discussed below, that address selection effects, which have constituted a challenge in prior work (Johnson and Easterling 2012).

THE CURRENT STUDY

Several interrelated lines of scholarship—theory and research on mass incarceration and reentry, empirical studies of the effects of parental incarceration, and life-course theoretical perspectives—collectively underscore the potential for parental incarceration to constitute a critical turning point in the lives of children, one that creates harms visible well into young adulthood. The goal of this paper thus is to test the hypothesis that parental incarceration adversely affects grown children along a range of life domains, including criminal behavior,

mental health, illegal drug use, education, earnings, and intimate relationships.

To this end, the study employs propensity score matching (PSM) analyses of Add Health data, with a focus on respondents who participated at waves 3 and 4 (N = 12,844). Add Health wave 1 data were collected nationally in 1994-1995 from almost 19,000 students in grades 7-12. Respondents' parents also were interviewed at wave 1. Data collection for wave 3 occurred from 2001-2002 and for wave 4 occurred from 2007-2008. Use of these later waves allowed for investigation of parental incarceration effects on early young adulthood and late young adulthood outcomes. Multiple imputation was used to reduce potential bias that can arise from item-missing data. Across all variables, median missingness was only 8 percent. Even so, the *ice* procedure in Stata (Royston 2005) was used to impute data and resulting estimates from repeated imputations were combined following Rubin's (1987) rules.

For the study, the "treatment" group consists of individuals who at wave 4 reported that one or both of their parents had been incarcerated by the time of the wave 3 interview (N = 1,847). Using PSM, five-to-one nearest-neighbor matching, this group then is matched to individuals who reported that their parents had not been incarcerated (N = 4,496). In turn, we compare treated and matched groups on post-parental incarceration outcomes during early young adulthood, the period when the individuals were ages 18 to 28 (94 percent of respondents were between ages 18-24). The two groups are compared again, using the same outcomes, during late young adulthood, the period when these same individuals were ages 26 to 34 (93 percent of respondents were between ages 26-31). In short, we leverage the longitudinal nature of the Add Health data by using wave 1 data to predict parental incarceration events, the bulk of which occurred subsequent to wave 1, and then to assess whether parental incarceration is associated with child outcomes during early young adulthood (wave 3) and late young adulthood (wave 4). In ancillary analyses, which seek to explore further the relationship between parental incarceration and subsequent child outcomes in early and late young adulthood, we revisit this approach by focusing on a sub-set of the treated individuals—specifically, those children who had parents who were incarcerated after wave 1 and before wave 3. These analyses are

discussed further below when presenting the study's main findings.

One of the central reasons for undertaking PSM analyses is to address concerns about selection effects. These may arise from differences—among children who have experienced parental incarceration as compared to children who have not experienced it—in demographic factors (e.g., race, ethnicity, sex, and age), family context (e.g., household socioeconomic status, parental separation, and number of siblings), and neighborhood context that may be associated with poor outcomes in young adulthood (Giordano 2010). Addressing this problem is, as Hagan and Dinovitzer (1999:128) and others (e.g., Phillips et al. 2006; Johnson and Easterling 2012) have emphasized, critical for determining whether parental incarceration itself, rather than the factors associated with its occurrence, contributes to poor life outcomes for children. In short, scholars must take steps to isolate any potential impact of parental incarceration on life outcomes from the effects of other preexisting risk factors. Below, we discuss the measures used in the study and details about the analytic strategy. Descriptive statistics are provided in table 1.

Insert table 1 about here

Dependent Variables

This study examines eight different outcomes for children in early young adulthood and in later young adulthood, respectively. *Criminal offending* was the sum of eight dichotomous items assessing whether in the past year respondents had damaged property, stolen something worth over $50, stolen something worth under $50, entered a house or building to steal something, used or threatened to use a weapon get something from someone, sold marijuana or other drugs, taken part in a physical group fight, or hurt someone in a fight badly enough to require medical care. *Depression* was the average of nine items assessing whether in the past seven days respondents: had been bothered by things that usually did not bother them, could not shake off the blues, felt they were as good as other people (reverse coded), had trouble keeping their mind on what they were doing, were depressed, were too tired to do things, enjoyed life (reverse coded), were sad,

or felt that people disliked them (for each, 0 = never or rarely, 3 = most or all of the time). *Drunkenness* was the past-year frequency with which the respondent had been drunk or very high on alcohol (0 = none, 6 = every day or almost every day). *Marijuana use* was an indicator of whether or not the respondent had used marijuana in the past 30 days (1 = yes, 0 = no).

Several additional life domain measures are examined as well. *Educational attainment* was the highest year of school that the respondent had completed (1 = eighth grade or less, 5 = one or more years of graduate school). *Earnings* were measured as the log of respondents' reports of their prior-year pre-tax earnings from wages, tips, bonuses, overtime, and self-employment. In cases where respondents were unaware of their exact earnings, they were prompted to select from a list of ranges (at wave 3, 1 = less than $10,000, … , 8 = $75,000 or more; at wave 4, 1 = less than $5000, … , 12 = $150,000 or more). The logged midpoint of a given interval was used as those respondents' estimated logged earnings. *Married* was a binary measure indicating whether the respondent was living with a spouse at the time of the interview (1 = yes, 0 = no). *Cohabiting* was measured based on whether respondents reported living with a non-marital romantic partner at the time of the interview (1 = yes, 0 = no).

Independent Variable

Our primary independent variable, or "treatment," is *parental incarceration*. This measure was obtained using wave 4 interview data. Respondents indicated whether either of their parents had ever been to jail or prison and reported their age at the time of either parent's first incarceration. Only youth who had a parent incarcerated *prior* to the wave 3 data collection period were coded as having experienced parental incarceration. This approach ensured that the study then could examine the effects of parental incarceration on subsequent child outcomes—that is, outcomes that occurred among children (aging into adulthood) during the wave 3 and wave 4 data collection periods, respectively. The resulting measure thus is a binary variable (1 = parent ever incarcerated, 0 = no). On average, respondents who had a parent who was

incarcerated during their lifetime were 13 years old when it occurred. Half of these respondents had experienced more than one parental incarceration prior to wave 4.

Matching Variables

For the matching analyses, we draw on a rich array of measures available in the Add Health data. We use a wide range of confounders identified in the parental incarceration literature (e.g., Wakefield and Wildeman 2011; Murray et al. 2012; Turney 2014) and include additional measures, such as parental drug abuse and child maltreatment, that scholars (e.g., Sampson 2011) have advocated incorporating into matching analyses focused on parental incarceration effects.

Several demographic variables were included as covariates. *Offspring (respondent) age* was measured in years at the time of the wave 3 interview and *male* is measured using a dichotomous indicator (1 = male, 0 = female). *Race and ethnicity* was captured using dummy variables: black (1 = yes, 0 = no), Hispanic (1 = yes, 0 = no), or other non-white race or ethnicity (1 = yes, 0 = no), with white as the reference category.

Separately, social, economic, family, and neighborhood covariate measures were included. *Household socioeconomic status* was measured as the mean of the z-scores of respondents' wave 1 parents' educational and occupational attainment. *Parental economic hardship* was measured based on whether, at wave 1, the responding parent had insufficient funds to pay bills (1 = yes, 0 = no). *Intact family during adolescence* was based on whether, at wave 1, youth lived with two married parents (1 = yes, 0 = no). *Number of siblings* was measured as a truncated count (0 = none, 1 = one, 2 = two or more siblings). *Mother-child separation* and *father-child separation*, respectively, were based on whether the biological parent had ever lived in a different household than that of the respondent's before wave 1 (1 = yes, 0 = no). *Parental alcoholism* was a binary measure based on the responding parent's wave 1 report of whether either biological parent was alcoholic (1 = yes, 0 = no). *Household illegal drug use* was a binary measure as well based on the child's wave 1 report of whether illegal drugs were available at home (1 = yes, 0 = no).

Parent-adolescent closeness was measured based on the average of two wave 1 items asking respondents to assess how close they felt to their mother and to their father, respectively (1 = not at all, . . ., 5 = very much); only one of the items was used for respondents with just one living or known parent. *Childhood sexual abuse* was a binary measure indicating whether, before sixth grade, respondents had been touched in a sexual manner or had been forced into sexual relations by a parent or caregiver (1 = yes, 0 = no).

Additional measures included the following. *Residential mobility* was gauged using a measure indicating whether respondents had moved during the five years prior to wave 1 (1 = yes, 0 = no). *English-speaking household* was based on respondents' wave 1 reports that English was the primary language spoken at home (1 = yes, 0 = no). *Immigrant* was a binary indicator of whether respondents were reported to have been born outside the United States (1 = yes, 0 = no). *Low birth weight* was measured based on whether respondents weighed less than five pounds and eight ounces at birth (1 = yes, 0 = no). *Mother's age at offspring's birth* was computed as the difference in years between mothers' and respondents' ages at wave 1. *Neighborhood disorder* was measured using the mean of parents' wave 1 responses to two items that assessed the extent of two problems in their neighborhoods: litter or trash on the streets and sidewalks, and drug dealers and drug users (1 = no problem at all to 3 = a big problem). Finally, *neighborhood safety* was measured based on whether the interviewer felt concerned for his or her safety when at the respondent's home (1 = yes, 0 = no).

Analytic Strategy

We use PSM analyses to estimate the effect of parental incarceration on child outcomes, and examine outcomes at two different periods in time—early young adulthood and late young adulthood. The use of matching analyses, data on young adulthood, and two periods of time in young adulthood responds to calls by scholars to employ longitudinal data, to use stronger, more credible approaches, such as matching designs, to address potential confounding, and to examine

how parental incarceration may constitute a life-course event that alters the life chances of children in ways that persist from the transition into adulthood into later young adulthood.

A central concern in comparing a sample of children who experienced a parent going to prison with a sample of children who did not is that the two groups differ in other ways that contribute to early and late young adulthood outcomes. Clearly, an experimental design is not possible as an approach to reduce or eliminate potential confounding in estimating the effect of parental incarceration. Accordingly, we employ a quasi-experimental analytic approach to address this issue. Specifically, we use PSM to create a control group that is matched to the "treatment" group based on observed confounders, such that group balance on the confounds is achieved. A central advantage of matching analyses lies in the ability, when a large number of cases exist, to address selection effect biases and approximate an experimental design (Smith 1997; Harding 2003; Winship and Morgan 1999). The logic of propensity score matching is that any difference in outcomes between the parental incarceration (treatment) group and control group, given observed covariate balance across treatment and control groups, should be due to a treatment effect (Rosenbaum and Rubin 1985; Apel and Sweeten 2010).

The PSM analyses progress through three steps to produce estimated average treatment effects on the treated (ATT) (Becker and Ichino 2002). First, we use logistic regression modeling to estimate, based on the observed matching covariates, propensity scores—that is, the probability of an individual having an ever-incarcerated parent.

Second, respondents with an ever-incarcerated parent (treatment group) are matched to respondents who did not have an ever-incarcerated parent but who nonetheless had near-identical probabilities of experiencing parental incarceration (control group). We employed the nearest-neighbor algorithm to identify matches. Nearest-neighbor matching involves selecting, for each treatment case, one or more control cases that within a specified range or caliper have similar propensities. For the analyses, the nearest five neighbors and a caliper of .005 were used. The narrow caliper setting ensures that matches are as nearly identical as possible.

Third, we assessed the extent to which matching produced two groups that were comparable

with respect to observed covariates. This assessment included comparison of all covariate means between the two groups, with non-statistically significant differences and standardized differences of less than 20 percent indicating success in creating two comparable groups (Rosenbaum and Rubin 1985). Given no covariate imbalance, any differences in average outcomes for the two groups can more confidently be assumed to result from the effect of treatment (Winship and Morgan 1999), in this case parental incarceration.

Estimated differences in outcomes were obtained using logistic regression (for the two dichotomous outcomes), multinomial regression (for the one non-ordered categorical outcome), ordinal regression (for the two ordered categorical outcomes), negative binomial regression (for the one count outcome), and ordinary least squares regression (for the two continuous outcomes), with bootstrapped standard errors and with parental incarceration as the independent "treatment" variable. The analyses were restricted to the range of common support for the matched sample—that is, the range for which observed propensity scores existed for both the treatment and the control groups (Becker and Ichino 2002). Stata's *psmatch2* and *pstest* commands (Leuven and Sianesi 2003) were used for propensity score estimation and for balance testing, respectively.[1]

FINDINGS

As a first step in the matching analyses, logistic regression was used to generate predicted probabilities of the likelihood of having an ever-incarcerated parent. This step provides the basis for matching children who had an incarcerated parent to children who did not. Table 2 presents the results of the analysis. Almost three-fourths of the matching variables were statistically significant predictors of parental incarceration. As anticipated, age (as an index of exposure), race, and ethnicity all were statistically significant. Black or Hispanic children in particular were more likely to have an incarcerated parent as compared to white children (odds ratio = 1.42 and 1.46, respectively). Household socioeconomic status also predicted parental incarceration, as did parental separation. Alcoholism was strongly associated with having an ever-incarcerated

parent: The odds of parental incarceration were three times greater among children with a parent who was an alcoholic as compared to children who did not have an alcoholic parent (odds ratio = 3.10). Household illegal drug use also was associated with a greater probability of being the child of an incarcerated parent (odds ratio = 1.62). Still other factors were statistically significant. For example, residential mobility (odds ratio = 1.32) and immigrant status (odds ratio = .50) were positively associated and negatively associated, respectively, with having experienced parental incarceration. Factors that were not statistically significant as independent predictors of such incarceration included parental economic hardship and neighborhood disorder and safety. Collectively, the results accord with expectations from prior research, and the large set of statistically significant matching variables provides greater confidence that the matching analyses address potential confounding.

Insert table 2 about here

We turn next to the matching analyses. Using nearest neighbor matching and a conservative .005 caliper setting, a matched group of children was identified for the control group. To increase the efficiency of the estimates, five-to-one matching was used. As can be seen in table 3, covariate values for the treatment group ("parent ever incarcerated") and for the matched control group ("parent never incarcerated") are nearly identical. Indeed, *t*-test comparisons indicated that across all variables, no statistically significant differences existed. The percent reduction in bias statistic, which shows the extent to which matching reduced covariate imbalance between the treatment and control groups, reinforces this assessment and underscores the utility of the matching analyses. Achieving balance on the covariates is critical because it creates the approximation of an experiment and thus forms the foundation of propensity matching analyses. Becker and Ichino (2002) have emphasized that if balance obtains, then, independent of treatment status, observations with identical, or nearly identical, propensity scores can be expected to have the same distribution of observable characteristics: "In other

words, for a given propensity score, exposure to treatment is random and therefore treated and control units should be on average observationally identical" (p. 359).

Insert table 3 about here

Given balance on covariates, the analyses now center on comparison of outcomes across a range of life domains in early young adulthood (i.e., primarily the early 20s) and in late young adulthood (i.e., primarily the late 20s), respectively. Table 4 presents the estimated effects of parental incarceration for both groups. Several patterns surface.

Insert table 4 about here

First, across different life domains in early young adulthood, parental incarceration exerts a seemingly harmful effect. It is, for example, associated with greater levels of grown children's offending, mental health problems (i.e. depression), and illegal drug use (i.e. marijuana use). In addition, children of incarcerated parents obtain less formal education and are more likely to cohabit, though there is no evidence that they are less likely to be married. These effects are not trivial in magnitude. For example, for offending, the negative binomial coefficient (b) for parental incarceration is .23 ($p < .001$). That is, the log count of offending is .23 greater for children of incarcerated parents. Exponentiating the coefficient results in a relative risk ratio (Hilbe 2007) of 1.26, indicating that parental incarceration increases the expected number of different crimes that a young adult commits by 26 percent. The effect of parental incarceration on child depression during the transition to early young adulthood is notable as well. The linear coefficient (b) is .06, which translates into a 14 percent standard deviation increase in depression among children of an incarcerated parent.

Second, these effects persist into late young adulthood and in some instances are amplified. For example, the increases in levels of offending, depression, and marijuana use appear even greater among older young adults, as indicated by the larger estimated coefficients in late young

adulthood as compared to early young adulthood. However, declines in education levels among children of incarcerated parents—relative to matched counterparts who did not experience parental incarceration—are not more pronounced in late young adulthood.

Third, a greater range of harms occur by late young adulthood. Thus, alongside persistent or larger adverse effects on offending, depression, marijuana use, educational attainment, and cohabiting, two other harms emerge as statistically significant: heavy alcohol use (drunkenness) and earnings. Indeed, adverse effects are evident across all life domains except one—marital status. Parental incarceration appears to increase the likelihood that children will cohabit, which itself has been found to predict poor relationship quality (e.g., Jose et al. 2010; Rhoades et al. 2012), but it does not appear to influence the likelihood of marriage.

Here, again, the magnitude of the effects is not trivial. For example, the odds of children of incarcerated parents achieving any of the higher education levels were 33 percent lower, on average, than the odds of their matched counterparts achieving similar levels of education. Similarly, individuals in late young adulthood who, as children, had a parent who was incarcerated, had estimated earnings that on average were $2,953 less than that of the control group. Specifically, exponentiated predicted values based on the constant (9.37) and the coefficient for parental incarceration (-.29) from the logged earnings model revealed that children of incarcerated parents had average past-year earnings of $8,778 (exp[9.37 + -.29]), whereas children of non-incarcerated parents had average earnings of $11,731 (exp[9.37]).

In short, the analyses suggest support for the hypothesis that parental incarceration constitutes a turning point that adversely affects the life course of children, across multiple life domains, during the transition into adulthood and thereafter. From a methodological perspective, the persistence of adverse effects and the greater number of them over time reinforces the early young adulthood findings. That is, the persistence of effects, and in some cases the amplification of the effects, lends greater credence to the early young adulthood finding that parental incarceration negatively affects multiple life domains.

The robustness of the analyses can be assessed in a more formal manner. One approach is to

conduct matching analyses using different algorithms. Accordingly, we repeated the analyses using radius matching, which seeks matches from control cases that lie within a pre-determined distance (here, .005) from a given treatment case (Apel and Sweeten 2010), and one-to-one matching without replacement. In both cases the results for offending, depression, drunkenness, and marijuana use were almost identical to the results shown in table 4; the results for education were weaker but still statistically significant; the results for earnings were smaller and not statistically significant; and the results for cohabitation were robust at wave 3 but not at wave 4.

A second approach is to examine how vulnerable the estimated effects are to unobserved confounding (Rosenbaum and Rubin 1985). In particular, Rosenbaum bounds for continuous outcomes and Mantel-Haenszel bounds for binary outcomes (DiPrete and Gangl 2004; Becker and Caliendo 2007) can be computed following one-to-one matching without replacement. The bounds indicate how large an unobserved confounding variable's effect would need to be on the likelihood of parental incarceration to affect the study's results. Although the two types of bounds are not perfectly suited for the distributions of all of our outcomes, they can provide further suggestive evidence of robustness. We found that a moderately strong omitted predictor of parental incarceration would be needed to eliminate the associations described above. Such a predictor would need to increase the odds of parental incarceration by 10-20 percent to eliminate its association with depression, drunkenness, educational attainment, and cohabitation, by 10-40 percent to eliminate its association with criminal offending, and by 30-40 percent to eliminate its association with marijuana use. Phrased differently, an omitted confound would need to have an effect on parental incarceration similar to that of parent-child closeness (odds ratio = .82) or household socioeconomic status (odds ratio = .70) to affect the overall pattern of findings.

A third approach is to focus on a small subset of children whose parents were incarcerated after wave 1 and before wave 3 (N = 193; for the full sample, N = 1,865). One limitation of the above analyses is that they include predictors of parental incarceration that, for some respondents, may not have preceded the incarceration event. By focusing only on incarceration events after wave 1 but before wave 3 and examining impacts only on outcomes at wave 4, this

limitation can be avoided, but at the cost of reducing statistical power and the generalizability of the findings. The analyses, for example, focus only on a small sub-set of the larger sample and only parental incarceration events that occur during a child's adolescence. Even so, the matching analyses for this sample identified a pattern of substantive results at wave 4 that paralleled those from the main analyses. Due to reduced power, the statistical significance of the coefficients was lower or in some cases non-significant, yet the substantive pattern remained the same: Parental incarceration was associated with a range of adverse life outcomes in late young adulthood. The magnitude of effect was similar as well. For example, the coefficients overall were similar to those shown in table 4 using the full sample: offending (b = .34); depression (b = .09); drunkenness (b = -.01); marijuana use (b = .49); educational attainment (b = -.43); earnings (b = -.29); married (b = -.05); cohabiting (b = .23). Collectively, the two sets of analyses suggest greater warrant for viewing the estimated effects as credible and, at the same time, allow for greater generalizability than one or the other analysis by itself would allow.[2]

CONCLUSION

Mass incarceration constitutes one of the signature social changes that occurred in America in recent decades. Considerable attention understandably has focused on its effects on offenders and crime. Increasingly, however, scholars have highlighted the salience of incarceration for families and communities. Studies have documented the potential for imprisonment to adversely affect these groups both directly and indirectly. Released prisoners, for example, may commit more crime (Clear 2007; Nagin et al. 2009; Cochran et al. 2014). Yet, the harm also may be indirect. When prisoners return to their home communities, they may be more likely to be homeless, face difficulty finding employment, and have drug and mental health problems (Petersilia 2003; Travis 2005; Western 2006; Garland 2013). For children of incarcerated parents, such problems may compound those associated with growing up in what typically are disadvantaged settings (Wakefield and Wildeman 2014). The absence of a parent may exert

harmful effects—for example, families may be more likely to face housing or food insecurity and children may receive less supervision. Ironically, a parent's return home after a period of incarceration may amplify these problems. Similar to what has been found in studies of returning soldiers (Doyle and Peterson 2005; Danish and Antonides 2013), ex-prisoners carry with them experiences and strains that can make return to their families difficult and stressful.

An emerging body of empirical work suggests that parental incarceration indeed can adversely affect young children and does so along multiple life domains, including offending, health, and education (Wakefield and Wildeman 2009; Murray et al. 2012; van de Rakt et al. 2012; Turney 2014). When viewed from a life-course theoretical perspective, the implication is at once straightforward and yet critical: Parental incarceration may constitute a turning point that exerts harmful effects during and after the transition into adulthood (Uggen and McElrath 2014). However, one of the central challenges confronting studies of parental incarceration has been the need for measures of development across diverse life domains and for rigorous methodological approaches that can better address selection effects. A focus on transitions into adulthood creates an additional hurdle, namely, the need for longitudinal data that allow for repeated follow-up of children as they progress into adulthood (Sampson and Laub 2005).

This study sought to contribute to scholarship aimed at understanding the consequences of mass incarceration and to scholarship on the life course and the turning points that can alter life trajectories. Using propensity score matching analyses of Add Health data, we found that parental incarceration negatively affected multiple life domains among children as they transitioned into adulthood and that these effects persisted or were amplified as children grew older and entered late young adulthood. Adverse effects accumulated over time. By late young adulthood, these children fared poorly—as compared to their matched counterparts who did not experience parental incarceration—across several life domains, including offending, mental health, education, earnings, and relationships. In short, parental incarceration appears to constitute a critical turning point that not only affects outcomes during childhood, as prior studies have established (see, e.g., Murray and Farrington 2008; Murray et al. 2012; Turney

2014), but also may affect outcomes during adulthood.

We turn now to several implications of these findings. First, the study results suggest that parental incarceration may constitute a turning point that holds the potential to negatively affect children as they progress into adulthood. Life-course scholarship has identified other critical turning points, such as divorce (Cherlin et al. 1998; Amato 1999), that can adversely affect the life trajectories of children, and it also has identified that incarceration can be a turning point in the lives of those who experienced the incarceration (e.g., Siennick et al. 2014). However, given the dearth of empirical studies on life-course outcomes of children of incarcerated parents, we echo Porter and King's (2015) call for further empirical research on the effects of parental incarceration on children before concluding that parental incarceration is harmful to children. This study responded to calls for more rigorous methodological approaches to addressing selection effects (Hagan and Dinovitzer 1999; Johnson and Easterling 2012). The use of propensity score analyses and the large number of matching variables, along with the sensitivity analyses and the evidence of persistent effects over time, lend credibility to the results. Even so, because of the inability to fully address the time ordering of parental incarceration and outcomes among children as they progress into adulthood, as well as the possibility that unobserved confounding may have biased the results, the findings should be interpreted with caution.

Indeed, it will be important for studies that examine outcomes over the life course to accumulate to be more confident that the patterns identified here are generalizable. Such studies will want to address confounding using data sets such as Add Health, which allow researchers to follow children of incarcerated parents over time. Ideally, too, however, they will include a larger array of potential confounders. This study relied on variables that have been used in prior studies, but additional measures would help to ensure that "apples-to-apples" comparisons are made between children of incarcerated parents and children of non-incarcerated parents, respectively. The focus necessarily should be on identifying and including as full a range of causes of parental incarceration, and child outcomes during and after the transition into adulthood, to ensure the validity of estimated effects of incarceration on children. Alternative

methodological approaches, too, offer a foundation for developing a body of work that will provide a more credible foundation on which to identify and explain parental incarceration effects. For example, Porter and King (2015) have exploited the longitudinal nature of the Add Health data to compare delinquency outcomes of children of parents who have been incarcerated to children whose parents at a later date will be incarcerated. Continued research is needed that employs this approach or matching designs, and, more generally, that systematically attempts to address causal ordering and confounding.

Second, the clear implication from life-course studies of parental incarceration is that it may harm children through distinct causal mechanisms. For example, it may result in less supervision of children, which in turn may result in lower school attendance, reduced emotional attachment, and weakened development of social skills. It may result, too, in greater financial insecurity, which can result in greater residential mobility and poor nutrition, as well as emotional strain for the primary caregiver. Here, again, poor parenting, including abuse, may be more likely. Not least, children of incarcerated parents may face social stigma.

Removal of a parent in some circumstances can be beneficial. However, to the extent that it is harmful, diverse causal pathways exist that may negatively affect different life domains. It will be important for future studies to empirically assess these pathways and how they unfold over time (see, e.g., Porter and King 2015). Some effects may emerge relatively quickly while others may unfold more slowly or require activation by a particular life event. For example, parental incarceration may affect school attendance and performance relatively quickly but its effects on employment outcomes may not emerge clearly until adulthood, as suggested by the findings in this study. In addition, some of the life domain changes may interact with one another (Agnew 2005). Parental incarceration may contribute to emotional strain when a child is at home, and this experience, when coupled with declining school attendance or performance, may increase the likelihood of criminal activity.

In addition, parental incarceration effects may vary depending on how frequently parents have been incarcerated, the duration of a parent's incarceration, whether other relatives have ever

been incarcerated, and whether children reside with their parents during the transition into adulthood. It remains unclear what the effects would be. For example, it may be that continued involvement with parents mutes adverse effects by enabling children to resume or improve their relationship with them. Alternatively, greater strain and exposure to criminogenic or unhealthy environments may occur, and, in turn, amplify adverse effects of parental incarceration. Investigation of such possibilities—and, more generally, of the potential "heterogeneous effects" of parental incarceration (Uggen and McElrath 2014; Johnson and Easterling 2015; Turney and Wildeman 2015)—constitutes an avenue of research that may generate important insights about youth transitions into adulthood. For example, parental incarceration effects may vary among siblings. For some, it may be harmful and for others the effect may be minimal, suggesting in turn the potential for parental incarceration potentially to interact with child characteristics. Here, again, investigation of the heterogeneity of parental incarceration effects will be critical.

Third, although no policy can be derived directly from the study's findings, a clear implication is that an accounting of the true costs of incarceration requires going beyond a focus on building and operational costs of prisons, other correctional system costs, or potential effects on crime rates. It requires inclusion of information about collateral consequences for offenders (Cochran et al. 2014) and the benefits or harms that may extend to children, families, and communities (Hagan and Dinovitzer 1999; Travis 2005; Clear 2007; Garland 2013). Not least, such an accounting requires assessment of costs and benefits that emerge over time, as suggested by this study and other research on the effects of parental incarceration (Wakefield and Wildeman 2009; Murray et al. 2012; Turney 2014).

Revising punishment policy based on evidence that incarceration may harm children likely would face considerable hurdles. Just sanctioning, for example, likely should not entail less severe punishment of individuals "simply" because they have children. By the same token, sanctioning that occurs without consideration of the consequences for others raises obvious concerns. Punishment ultimately should help society, not worsen public safety and impose more costs. We offer no solution here to this dilemma save to suggest that punishment policies should

be crafted in ways that force policymakers and court officials to employ sanctions that are likely to improve public safety and the greater good, not worsen both (Clear 2007; Nagin et al. 2009).

A final observation: Even if parental incarceration does not itself cause harm to children, it may serve as a prominent red flag that their children may be substantially at risk of poor outcomes across multiple life domains during adolescence and into adulthood. These include the potential for offending, addiction and mental illness, poor academic performance, and difficulty securing and retaining gainful employment. This study suggests that the increased risk is independent of that associated with family disruption and hardship, early relationship problems, neighborhood disorder, and other disadvantages already faced by children who experience a parent's incarceration. Accordingly, parental incarceration itself, independent of such factors, may constitute a signal that social service agencies and the courts might use to identify individuals who potentially need ongoing support or intervention.

ENDNOTES

[1] In ancillary analyses, we controlled for age even though the matching resulted in no average age difference between the treatment and control groups. This step was taken to check that the results indeed would not be affected by age, and by extension, developmental, differences across the groups. The results were statistically and substantively parallel to those in the paper.

[2] A different approach to addressing potential unobserved confounding between the treatment and control groups is to match on the outcomes at an earlier time period. From a logical standpoint, these lagged outcomes are not events that should contribute to parental incarceration. In addition, not all young adult outcomes have counterparts that occur during infancy, childhood, or adolescence. For example, compiling lagged versions of the earnings and marriage outcomes is not possible at these younger ages. Even so, wave 1 data provided some parallel, or analogous, outcomes, such as delinquency, depression, drunkenness, marijuana use, and school grade point average, and these in turn can be viewed as providing a different approach to addressing potential confounding. Analyses that used these lagged outcomes as additional matching variables yielded results that were nearly identical to those shown in table 4.

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Table 1

Descriptive Statistics for Study Variables

	Full Sample		Parent Ever Incarcerated		Parent Never Incarcerated			
Variable	Mean	SE	Mean	SE	Mean	SE	Min	Max
Focal independent variable								
Parent ever incarcerated	0.15	(0.00)	1.00	(0.00)	0.00	(0.00)	0	1
Offspring Early Young Adulthood Outcomes								
Criminal offending	0.44	(0.01)	0.55	(0.03)	0.42	(0.01)	0	8
Depression	0.51	(0.00)	0.59	(0.01)	0.50	(0.00)	0	2.78
Drunkenness	1.12	(0.01)	1.04	(0.03)	1.14	(0.01)	0	6
Marijuana use	0.22	(0.00)	0.28	(0.01)	0.21	(0.00)	0	1
Educational attainment	3.47	(0.01)	3.18	(0.02)	3.52	(0.01)	1	5
Earnings (in ln$)	7.99	(0.03)	7.78	(0.09)	8.03	(0.04)	0	11.63
Married	0.16	(0.00)	0.17	(0.01)	0.16	(0.00)	0	1
Cohabiting	0.13	(0.00)	0.19	(0.01)	0.12	(0.00)	0	1
Offspring Late Young Adulthood Outcomes								
Criminal offending	0.20	(0.01)	0.33	(0.02)	0.18	(0.01)	0	8
Depression	0.59	(0.00)	0.69	(0.01)	0.57	(0.00)	0	3
Drunkenness	0.96	(0.01)	1.02	(0.03)	0.95	(0.01)	0	6
Marijuana use	0.16	(0.00)	0.23	(0.01)	0.15	(0.00)	0	1
Educational attainment	4.02	(0.01)	3.66	(0.02)	4.08	(0.01)	1	5
Earnings (in ln$)	9.47	(0.02)	9.06	(0.07)	9.54	(0.03)	0	12.32
Married	0.40	(0.00)	0.35	(0.01)	0.41	(0.00)	0	1
Cohabiting	0.18	(0.00)	0.23	(0.01)	0.17	(0.00)	0	1
Covariates								
Offspring age	21.92	(0.02)	21.79	(0.04)	21.94	(0.02)	18	29
Offspring is male	0.46	(0.00)	0.44	(0.01)	0.46	(0.00)	0	1
Black	0.22	(0.00)	0.31	(0.01)	0.20	(0.00)	0	1
Hispanic	0.16	(0.00)	0.17	(0.01)	0.15	(0.00)	0	1
Other non-White race / ethnicity	0.09	(0.00)	0.06	(0.01)	0.10	(0.00)	0	1
Household socioeconomic status	0.04	(0.01)	-0.29	(0.02)	0.10	(0.01)	-2.61	2.07
Parental economic hardship	0.19	(0.00)	0.27	(0.01)	0.17	(0.00)	0	1
Intact family during adolescence	0.55	(0.00)	0.24	(0.01)	0.60	(0.00)	0	1
Number of siblings	1.22	(0.01)	1.18	(0.02)	1.22	(0.01)	0	2
Mother-child separation	0.14	(0.00)	0.28	(0.01)	0.12	(0.00)	0	1
Father-child separation	0.43	(0.00)	0.75	(0.01)	0.38	(0.01)	0	1
Parental alcoholism	0.17	(0.00)	0.42	(0.01)	0.12	(0.00)	0	1
Household illegal drug use	0.03	(0.00)	0.06	(0.01)	0.03	(0.00)	0	1
Parent-adolescent closeness	4.16	(0.01)	3.84	(0.02)	4.21	(0.01)	1	5
Childhood sexual abuse	0.12	(0.01)	0.18	(0.02)	0.10	(0.01)	0	5
Residential mobility	0.44	(0.00)	0.60	(0.01)	0.42	(0.00)	0	1
English-speaking household	0.90	(0.00)	0.93	(0.01)	0.90	(0.00)	0	1
Immigrant	0.07	(0.00)	0.03	(0.00)	0.08	(0.00)	0	1
Low birth weight	0.15	(0.00)	0.18	(0.01)	0.14	(0.00)	0	1
Mother's age at offspring's birth	25.77	(0.05)	23.64	(0.13)	26.13	(0.05)	14	40
Neighborhood disorder	1.51	(0.00)	1.61	(0.01)	1.49	(0.01)	1	3
Neighborhood safety	0.04	(0.00)	0.06	(0.01)	0.04	(0.00)	0	1
N	12,844		1,871		10,973			

Source : National Longitudinal Study of Adolescent Health.

Table 2

Logistic Regression of Parental Incarceration on Matching Variables (N = *12,844)*

Variable	b	SE		OR
Offspring age	-0.09	(0.02)	***	0.91
Offspring is male	0.12	(0.06)	*	1.13
Black	0.35	(0.07)	***	1.42
Hispanic	0.38	(0.10)	***	1.46
Other non-White race / ethnicity	-0.01	(0.13)		0.99
Household socioeconomic status	-0.36	(0.03)	***	0.70
Parental economic hardship	0.14	(0.07)	†	1.15
Intact family during adolescence	-0.39	(0.14)	**	0.68
Number of siblings	-0.01	(0.04)		0.99
Mother-child separation	0.32	(0.07)	***	1.38
Father-child separation	0.48	(0.13)	**	1.62
Parental alcoholism	1.13	(0.08)	***	3.10
Illegal household drug use	0.48	(0.14)	***	1.62
Parent-adolescent closeness	-0.20	(0.03)	***	0.82
Childhood sexual abuse	0.04	(0.04)		1.04
Residential mobility	0.28	(0.07)	***	1.32
English-speaking household	0.31	(0.14)	*	1.36
Immigrant	-0.70	(0.16)	***	0.50
Low birth weight	0.12	(0.09)		1.13
Mother's age at offspring's birth	-0.05	(0.01)	***	0.95
Neighborhood disorder	0.05	(0.06)		1.05
Neighborhood safety	0.10	(0.13)		1.11
Constant	1.07	(0.54)	†	

Source : National Longitudinal Study of Adolescent Health.

†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 3

Descriptive Statistics and Balance Statistics for Matched Samples

	Parent Ever Incarcerated	Parent Never Incarcerated		
Variable	Mean	Mean	*t* for Difference in Means	Percent Reduction in Bias
Offspring age	21.79	21.82	-0.44	77%
Offspring is male	0.44	0.45	-0.42	65%
Black	0.31	0.32	-0.73	89%
Hispanic	0.17	0.17	-0.17	73%
Other non-White race / ethnicity	0.06	0.06	-0.08	92%
Household socioeconomic status	-0.28	-0.29	0.26	98%
Parental economic hardship	0.27	0.27	0.41	94%
Intact family during adolescence	0.25	0.24	0.68	97%
Number of siblings	1.18	1.17	0.36	70%
Mother-child separation	0.27	0.28	-0.24	97%
Father-child separation	0.75	0.76	-0.70	97%
Parental alcoholism	0.41	0.40	0.59	97%
Illegal household drug use	0.05	0.05	0.33	83%
Parent-adolescent closeness	3.85	3.86	-0.40	97%
Childhood sexual abuse	0.18	0.20	-0.18	80%
Residential mobility	0.60	0.60	-0.06	99%
English-speaking household	0.93	0.93	-0.11	97%
Immigrant	0.03	0.04	-0.25	96%
Low birth weight	0.18	0.18	0.04	95%
Mother's age at offspring's birth	23.66	23.71	-0.26	97%
Neighborhood disorder	1.61	1.62	-0.24	94%
Neighborhood safety	0.06	0.07	-0.89	67%
N	1,865	4,454		

Table 4

Propensity Score Matching Nearest Neighbor Estimates Predicting Young Adult Outcomes from Prior Parental Incarceration

	Early Young Adulthood			Late Young Adulthood		
Young Adult Outcome	b	SE		b	SE	
Criminal offending[a]	0.23	(0.07)	***	0.54	(0.10)	***
Depression[b]	0.06	(0.01)	***	0.09	(0.02)	***
Drunkenness[c]	0.00	(0.05)		0.12	(0.05)	*
Marijuana use[d]	0.36	(0.07)	***	0.47	(0.09)	***
Educational attainment[c]	-0.44	(0.06)	***	-0.40	(0.06)	***
Earnings (in ln$)[b]	-0.18	(0.11)	†	-0.29	(0.09)	**
Married[e]	0.11	(0.08)		-0.05	(0.07)	
Cohabiting[e]	0.35	(0.08)	***	0.24	(0.07)	**

Note : Estimates are coefficients predicting outcomes from parental incarceration among matched sample.

Source : National Longitudinal Study of Adolescent Health.

[a]Negative binomial coefficients shown.

[b]Linear coefficients shown.

[c]Ordinal coefficients shown.

[d]Logistic coefficients shown.

[e]Multinomial logistic coefficients shown; reference category was neither married nor cohabiting.

N_{treat} = 1,849; $N_{control}$ = 4,437.

†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.