Examining the Intergenerational Transmissions of Disadvantage: The Effects of Paternal Incarceration among Young Adults in the United States

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Abstract

Since 1980, the number of children with an incarcerated parent has increased eight-fold, approaching 2.7 million. A growing literature has examined behavioral outcomes among these children into young adulthood, including later involvement in the criminal justice system. Current work shows that parental imprisonment is a predictor of youth delinquency and arrest. However, few analyses have explored whether paternal imprisonment is also a predictor of incarceration among young adults. Furthermore, studies in this area are also particularly vulnerable to selection bias. Using a nationally-representative sample of 12,240 young adults from Add Health, our findings show that individuals with an ever-incarcerated father have higher odds of, themselves, experiencing incarceration, even after controlling for a wide range of individual, family, neighborhood, and school characteristics. Results from propensity score matching suggest that our findings are unlikely to be driven entirely by unobserved heterogeneity. We also find that the association between father and young adult incarceration is similar across racial/ ethnic groups, although predictors of incarceration do differ by race. Our findings indicate that the negative effects of having an ever-incarcerated father persist into young adulthood. They also point to paternal incarceration as a key mechanism in the reproduction of disadvantage across generations.

Introduction

In the past three decades, the number of children in America with a parent in jail or prison has increased nearly seven-fold, from 350,000 in 1980 (Western and Wildeman 2008) to 2.7 million today (The Pew Charitable Trusts 2010). A burgeoning academic literature examining the social consequences of mass incarceration on the family has shown parental imprisonment to be associated with a number of negative outcomes among children, ranging from material hardship (Schwartz-Soicher, Geller, and Garfinkel 2011) and residential instability (Geller et al. 2009) to lower educational attainment (Foster and Hagan 2009), and an elevated risk of anxiety, depression (Wakefield and Wildeman 2011), and post-traumatic stress (Bocknek, Sanderson, and Britner 2008).

A subset of this literature has begun to focus on the behavioral outcomes of children with incarcerated parents, examining not only the likelihood of problem behaviors during childhood (Geller et al. 2009, 2012), but into adolescence and young adulthood, as well. In addition, some scholars have begun to investigate whether the young adult children of incarcerated parents are also more likely to be involved with the criminal justice system. Studies using nationally representative samples of young people, as well as those focusing exclusively on at-risk children (Aaron and Dallaire 2010; Kjellstrand and Eddy 2011) have found that youth with an incarcerated parent have an increased propensity of delinquency (Roettger and Swisher 2011; Swisher and Roettger 2012) and arrest (Roettger and Swisher 2011).

Nonetheless, few studies in the current literature have extended their investigation to examine whether youth with an imprisoned parent have an increased likelihood of ever being incarcerated, themselves. (See Beaver 2012 for a notable exception). Yet, given that parental

imprisonment is not only associated with a wide range of negative child outcomes, but is shown to be especially concentrated among the most disadvantaged segments of the population (Pettit and Western 2004; Wildeman and Western 2010), understanding patterns of incarceration from one generation to another is crucial to our knowledge of the intergenerational transmission of disadvantage.

Using a sample of 12, 240 young adults from the National Longitudinal Study of Adolescent Health (Add Health), this paper examines whether paternal imprisonment is a strong predictor of young adult incarceration, even after controlling for a wide range of demographic, neighborhood, family, and individual covariates. In addition, given the disproportionate representation of Blacks and Latinos in prison, we consider whether predictors of imprisonment, including paternal imprisonment, are different across racial and ethnic groups. Last of all, our study attempts to address one of the main methodological challenges often associated with research in this area (Johnson and Easterling 2012): disentangling the causes and effects of imprisonment from other factors, such as personality and behavioral characteristics of the father and child. We attempt to address this issue by leveraging propensity score matching in order to reduce selection effects and assess whether there is a potentially causal relationship between father and young adult imprisonment.

Our analysis reveals that young adults with an ever-incarcerated father have higher odds of being incarcerated, even after including a strategic set of controls in our analysis. Results from propensity score matching indicate that our findings are unlikely to be driven by unobserved heterogeneity. In addition, we find that the association between father and young adult incarceration is not differentiated by race/ ethnicity, although predictors of incarceration differ slightly by race. Our results demonstrate that the negative effects of having an ever-incarcerated

father persist into young adulthood. They further point to the role of paternal incarceration as a key mechanism in the reproduction of disadvantage across generations.

Current Literature

Why would we expect having an ever-incarcerated father be a predictor of a young adult's own incarceration? Criminologists have proposed several mechanisms to explain how a parent's imprisonment may promote a child's future criminality or involvement in the criminal justice system: the strain of economic deprivation; the stigma and shame of social labeling associated with having an incarcerated parent; and socialization into deviant behavior through role modeling or a lack of parental support or supervision.

Economic strain

Strain theory views criminal behavior as arising when an individual's circumstances prevent one from attaining culturally-defined markers of success through legitimate channels, compelling him to turn to illegitimate means, such as deviant behavior, to do so (Agnew 1992; Merton 1938). Moreover, economic strain may be particularly instructive, not only to our understanding of the factors that contribute to a parent's incarceration, but those that may lead to the imprisonment of his or her young adult child, as well. Incarcerated individuals are disproportionately likely to have lower levels of education (Pettit and Western 2004) and thus relatively limited earning potential prior to their imprisonment. The loss of income as a result of a partner or spouse's incarceration can lead to greater financial insecurity for an entire household, especially if the resident parent must leave her job to care for their children (Arditti,

Lambert-Shute, and Joest 2003). Upon re-entry, the former prisoner experiences educational barriers to socioeconomic mobility, compounded by employment discrimination (Pager, Western, and Sugie 2009; Pager 2003) and slow wage growth (Western 2002), in addition to ineligibility for public benefits. The cumulative result of these processes is that the child of an incarcerated parent is at an increased risk of experiencing persistent childhood poverty, which is, itself, associated with an increased likelihood of behavioral problems (Brooks-Gunn and Duncan 1997) and delinquency (Jarjoura, Triplett, and Brinker 2002) – and may ultimately lead to involvement with the criminal justice system. In this way, economic strain may not only lead to incarceration for a parent, but reproduce this outcome across generations.

Stigma

While an individual may experience discrimination due to a history of incarceration, this social stigma or bias may also be experienced by his or her children (Farrington and Jolliffe 2001). According to *labeling theory*, offenders experience a process of "official labeling," in which the stigma associated with a conviction persists across generations (Hagan and Palloni 1990). As a result, the child of an incarcerated individual – who is preemptively labeled a criminal – may be disproportionately likely to be arrested or charged for criminal activity (Murray, Farrington, and Sekol 2009). In addition to institutional stigma or bias, an individual with an incarcerated parent may also experience stigma socially. This may discourage the child from being involved in pro-social institutional activities, such as school and church, and thereby increase his or her likelihood of becoming further marginalized from mainstream, socializing institutions (Foster and Hagan 2009).

Socialization

The intergenerational transmission of criminal justice involvement can also be understood through the dynamics at play within a household. Family processes and characteristics may mediate the relationship between parent and child incarceration in two primary ways: through a child's behavioral reactions to a parent's absence and imprisonment; and as the result of ineffective parenting strategies by a current or former offender, or his partner.

Attachment theory maintains that the physical parent-child separation that occurs as a result of parental imprisonment disrupts attachment relationships, ultimately leading to internalizing problems among children, such as anxiety and depression (Murray and Farrington 2008; Murray and Murray 2010; see also Bowlby 1969). The children of incarcerated parents have also been shown to exhibit a wide range of negative emotional and behavioral outcomes, including increased physical aggression (Geller et al. 2012; Wakefield and Wildeman 2011) and anti-social behaviors (Phillips, Burns, and Wagner 2002). It is possible that if the internalizing and externalizing behaviors that arise in response to a parent's incarceration are not adequately addressed, the child may begin to engage in deviant behavior and ultimately in criminal activity.

The formation of close parent-child relationships is also associated with a lower likelihood of child problem behaviors (Amato and Rivera 1999) or delinquency (Hoeve et al. 2012; Johnson et al. 2011). *Social bonding theory* posits that bonds formed with parents and peers encourage youth to adhere to culturally-acceptable values and behavior (Johnson and Easterling 2012; see also Hirschi 1969). However, parental incarceration is related to diminished contact with a child (Swisher and Waller 2008; Waller and Swisher 2006).

Effective parenting techniques are a second aspect of family dynamics shown to exert a moderating effect on engagement in delinquent activity is effective parenting techniques. For

instance, a meta-analysis by Hoeve et al. 2009 showed that monitoring – an effective parenting strategy – was negatively associated with delinquency. However, past parental incarceration is associated with the use of inappropriate and inconsistent discipline, youth problem behaviors, and youth delinquency, (Jean M. Kjellstrand and Eddy 2011). A formerly incarcerated parent is also more likely to struggle with mental illness or substance abuse – characteristics which may impede parenting abilities (Dannerbeck 2005). Additionally, a parent's incarceration may affect the child-rearing strategies of the resident parent, who must suddenly contend with being the sole parent and breadwinner while his or her partner is in prison (Arditti et al. 2003).

One way in which ineffective parenting is thought to mediate the relationship between parent and child criminality is through the cultivation of self-control. According to their well-known *general theory of crime,* Gottfredson and Hirschi (1990) maintain that a lack of self-control is at the core of criminal behavior and that its absence originates in ineffective parenting strategies - namely, the absence of discipline and a lack of parental attachment. In effect, parental monitoring has been shown to be negatively related to low self-control (Hay 2001). Yet parents who have been incarcerated for committing a crime, may, themselves, be lacking in self-restraint, and thus ill-equipped to adequately instill this characteristic in their children.

Intergenerational Patterns of Criminal Justice Involvement

Considering the multitude of ways in which a parent's incarceration may potentially affect a child's own chances of going to prison, it is not surprising that scholars have become interested in examining intergenerational patterns of criminal justice involvement. Some of the work in this area has focused on the concentration of offenders within a small number of families (Beaver 2012; Farrington and Jolliffe 2001; Rowe and Farrington 1997). Other work has

examined youth who were already deemed to be at-risk (Aaron and Dallaire 2010; Jean M. Kjellstrand and Eddy 2011), had shown previous behavioral problems (Bijleveld and Wijkman 2009), or were from known criminal families (Goodwin and Davis 2011). While this approach has enabled researchers to better understand at-risk populations, the results from these studies have limited applicability to the general population (Johnson and Easterling 2012).

Building on this prior literature, more recent studies using nationally-representative longitudinal data on American cohorts have found that paternal incarceration is associated with a greater propensity among sons for delinquency (Roettger and Swisher 2011; Swisher and Roettger 2012) and arrest (Roettger and Swisher 2011). Huebner and Gustafson (2007) also found that maternal incarceration was associated with a youth's later conviction and probation.

However, to our knowledge, there is only one existing study that specifically examines the relationship between a parent's incarceration and that of his or her young adult children. Using Add Health data, Beaver (2012) finds that having an ever-incarcerated parent increases a young adult's odds of being arrested and incarcerated. However, aside from two measures for maternal attachment and disengagement, this analysis does not control for any demographic, behavioral, community, or family characteristics. In sum, work in this area has focused almost exclusively on the relationship between a parent's incarceration and the delinquency, arrest, or criminal conviction of his or her young adult children. Our analysis seeks to address this gap in the literature.

Racial Variation in the Association between Paternal and Young Adult Incarceration

Given the considerable racial disparities in rates of imprisonment in the US (Pettit and Western 2004; Wildeman and Western 2010), it is possible that the magnitude of parental

incarceration as a predictor of young adult incarceration may differ across racial and ethnic groups. Scholars have advanced several competing explanations as to why the outcomes associated with parental incarceration – and, by association, the linkage between parent and child incarceration – may exhibit variation across racial and ethnic groups. For instance, the "double jeopardy hypothesis" (Dowd and Bengston 1978) suggests that having multiple marginalized statuses, such as the stigma of incarceration in addition to racial or socioeconomic disadvantage, may render the effects of incarceration – and, by implication, paternal incarceration - stronger and more negative for disadvantaged populations (Haskins 2011). On the other hand, as incarceration becomes more normative – such as within low-income African American communities - it may be less stigmatizing for both former offenders and their families (Hirschfield 2008).

The literature has yet to reach a consensus on outcomes of paternal incarceration by race. For example, Roettger and Swisher (2011) find the association of paternal incarceration with adolescent delinquency and arrest to be similar among blacks, whites, and Hispanics. However, others have found that incarceration reduces paternal engagement and coping ability more among white fathers than among minority men (Swisher and Waller 2008). Given these mixed findings, it is unclear whether we would expect to see variations in the association between paternal and young adult incarceration across different racial/ ethnic groups.

Social Selection

Finally, as (Johnson and Easterling 2012) have noted, current work has made few attempts to address the issue of selection bias in analyses exploring parental incarceration outcomes. After all, parental incarceration is rarely the first challenge that affected families face

(Kjellstrand and Eddy 2011), exacerbating difficult family situations, such as poverty or household dysfunction. Propensity matching is a technique that we use to eliminate some of the effects of unobserved heterogeneity in examining the association between paternal and young adult imprisonment.

Analysis

Data

Our analysis uses data from the National Longitudinal Study of Adolescent Health (Add Health), a longitudinal study which surveys a nationally representative sample of 20,745 adolescents on their social, economic, psychological, and physical well-being. The initial Wave I interview was conducted in 1994-95 when respondents were in grades 7 to 12 and was proceeded by follow-up interviews in 1996 (Wave II), 2001–2002 (Wave III), and 2007–2008 (IV), with approximately 14,700 (71.0%), 15,200 (73.0%), and 15,700 (75.5%) of the initial respondents completing each of the subsequent wave interviews, respectively.

We use the Add Health survey to examine the relationship between paternal and young adult incarceration for several reasons. First, this sample is representative of contemporary young adults, including those who have ever been incarcerated or were incarcerated at any point over the course of the study. Second, Add Health includes a large range of demographic and behavioral characteristics that are especially relevant to our analysis. Third, the longitudinal format of the survey enables us to follow a cohort of respondents during the crucial transition from adolescence to adulthood, when individuals are most at risk of criminal justice involvement.

We began by examining respondents who completed interviews at Wave I, III, and IV (n = 13,034), exploiting the longitudinal nature of the survey to control for characteristics that were present prior to incarceration. We excluded respondents who were institutionalized or living without a parent or legal guardian (*n* = 436) because they were unable to provide reliable information about parental supervision, school attachment, and academic achievement. We also omitted observations that were missing on whether the father was ever incarcerated (*n*=358). Our final analytic sample (N = 12,240) represents 94% of the original sample. In order to address sample selection issues arising from differential probabilities of sampling, the school-based design, and survey attrition, we used longitudinal weights. It is important to note that the school-based sampling frame may downwardly bias the estimates of incarceration for both the respondent and his or her father.

In order to keep as many observations as possible, we replaced missing values using multiple imputation, which relies on the distribution of observed data to estimate values for missing data. In the multiple imputation model, we included all independent variables related to the research question (Allison 2002), including cases with missing data on delinquency, arrest, and incarceration. However, because these cases are not likely to be missing completely at random, we used only the cases on which this data is not missing in our actual analysis. We then used the *ice* (imputation by chained equations) command in Stata to produce ten imputed datasets, which are considered adequate to produce valid inferences (Royston 2007). The findings using multiple imputation are substantively similar to those that use listwise deletion on both the independent and dependent variables.

Measures

Criminal Justice Involvement. The dependent variable is based on respondents' answers to the Wave IV question: "Have you ever spent time in a jail, prison, juvenile detention center or other correctional facility?" Unfortunately, this measure is limited with respect to duration and timing of incarceration and does not allow one to elucidate when the incarceration spell occurred in the respondent's life. Respondents who reported that they were ever incarcerated at Wave III, but not at Wave IV were counted as having a history of incarceration.

Paternal Incarceration. The key independent variable, paternal incarceration, is measured by the respondent's answer to the question: "Has your biological father ever spent time in jail or prison?" at Wave IV.

Controls

Consistent with existing research in this area (Roettger and Swisher 2011), we include a strategic set of covariates to control for characteristics shown to be associated with both paternal and offspring incarceration in young adulthood. Where possible, we use the measures for these characteristics before Wave IV in order to make a temporal distinction between the effects of incarceration and pre-existing characteristics.

Demographic and Neighborhood Characteristics

Our first group of controls includes demographic and neighborhood characteristics. Respondent *race/ethnicity* is specified by a series of dummy variables representing non-Hispanic white, African-American, Hispanic, and "other" race at Wave I. Because criminal activity has been shown to peak in young adulthood and decrease throughout the life course, we include both

age and *age-squared* measures in our analysis. *Family structure* is represented by a dichotomous indicator of whether the respondent lived with both biological parents at Wave I. *Family socioeconomic status* is measured using a combination of mother's and father's education and occupation recoded into a five point scale (Ford, Bearman, Moody 1999). In addition, we include dummy variables for *gender* and *nativity*. Finally, three variables measure neighborhood characteristics at the census tract level: *minority concentration*: whether more than 30% of neighborhood families are non-white; *neighborhood poverty*: where more than 30% of families are in poverty; and *population density*, the number of residents per square kilometer.

Family Processes

The second group of variables, which refers to family processes, includes indicators of both family dysfunction and well-being. *Unknown biological father* indicates whether the respondent has any information about his or her biological father. *Abuse* by a parent or caregiver indicates whether the respondent was slapped, kicked, or hit more than five times before the age of 10. *Maternal alcohol abuse* refers to whether the respondent's biological mother either has a history of alcoholism or had at least five alcoholic drinks in one sitting in the month prior to the interview.

For family well-being variables, *paternal closeness* is measured by the respondent's answer to the question: "How close do you feel to your biological father?" on a 5-point scale, ranging from "not close at all" to "extremely close." *Paternal involvement* is a dummy variable based on the respondent's report of engaging in certain activities with his or her father in the past month, such as shopping, playing a sport, or attending a cultural or sporting event or church service together. *Daily family meals* indicates whether the respondent reported eating a meal

with a parent or caregiver at least six times a week. Finally, *parental supervision* is a summary score out of a total of five types of supervisory activities in which the respondent's parents engage, such as establishing a weekend curfew or setting limits on television viewing.

Institutional Attachment

Our third group of controls represents institutional attachment, which is associated with lower involvement in delinquent behavior (Hirschi 1969). *School attachment* is measured by averaging the respondent's agreement or disagreement with six statements such as, "You feel close to others in school" and "You are happy at school." *Grade point average* is a continuous measure of grades on the last report card out of 4.0. *Time spent "hanging out" with friends* is a categorical variable based on the respondent's reported frequency of spending time with friends per week, ranging from not at all (=0) to five or more times per week (=3). Last of all, *religious attendance* indicates the frequency with which the respondent attended a religious service in the past year, from never to at least once a week.

Individual Characteristics

The final group of covariates refers to individual factors associated with incarceration. *Arrest history* indicates whether the respondent has "even been arrested by the police or taken into custody" at Wave III. *Delinquency* is a summary measure of the frequency with which the respondent engaged in any of 12 delinquent acts in the past year at Wave III (Guo et. al 2007; Guo et. al 2008).

In addition to past deviance or involvement with the criminal justice system, we also control for mental and physical health and anti-social behaviors. *Impulsivity* is measured on a 5-

point scale, ranging from whether respondents "strongly agree" to "strongly disagree" with the statement that they go "gut feeling without considering consequences". *Depression* is measured by respondents' scores on a modified 18-item version of the Center for Epidemiologic Studies Scale (CES-D). Scores of 24 or greater for females and 22 or more for males are considered to be predictive but not diagnostic of major depressive disorders among adolescents (Roberts, Lewinsohn, and Seeley 1991). *Physical health* is indicated by respondents' self-rated responses of their health, from excellent to poor. *Drug use* is a binary measure of whether a respondent reported using any illegal drugs in the past year.

Methods

Our analysis seeks to examine whether paternal incarceration remains a predictor of young adult imprisonment, even after including a robust set of controls. However, because of the methodological challenges associated with studying outcomes related to paternal incarceration – namely, selection bias – we use two different estimation techniques to answer our research question. We begin by using logistic regression to estimate whether paternal imprisonment is a predictor of young adult incarceration, introducing independent variables into the model in stepwise fashion. Model 1, our baseline estimate, includes only paternal incarceration as an explanatory variable. The remaining models introduce additional controls that adjust for respondents' demographic (Model 2) and family characteristics (Model 3), and institutional attachment (Model 4), respectively. Model 5, which is the most rigorous model, includes respondents' individual psychological and behavioral health characteristics.

We supplement these regression models with propensity score matching. Growing in popularity in the social sciences, this technique estimates the probability of being in the

treatment group based on observed characteristics in an attempt to reduce pre-existing differences between groups, thereby strengthening casual inference (Morgan and Harding 2006 Wakefield and Wildeman 2011). This method is particularly well-suited to addressing our research question because incarceration is not a randomly occurring event, a fact which challenges our ability to produce unbiased estimates of the effects of incarceration using traditional regression techniques.

In order to construct treatment and comparison groups, we ran a logistic regression to predict the probability of having an ever-incarcerated father and assigned each respondent a propensity score based on the observed characteristics mentioned above. Respondents with a high propensity of having ever-incarcerated fathers were matched to a control group who demonstrated the same propensity, but whose fathers were, in fact, never incarcerated.

After estimating the propensity score models, we checked covariate balance by comparing the sample means of the covariates in the treatment and control groups to ensure there were no statistically significant differences between the two. We then used kernel matching with a Gaussian kernel and a bandwidth of 0.06 to estimate the average treatment effect. Kernel matching compares the outcome of each treated person to a weighted average of the outcomes of all the untreated persons, with the highest weight being placed on those with scores closest to the treated individual (Heinrich, Maffioli, and Vázquez 2010). The advantage of using propensity score models is that once matched, the treatment and control groups should only differ from one another randomly on all background covariates.

Sample Description

Table 1 provides the descriptive statistics for our primary analytic sample, disaggregated by paternal incarceration history. Approximately 18.5% of respondents are attached to a father with an incarceration history. Nearly 30% of respondents with an ever-incarcerated father have spent time in prison, compared to just 12.5% of those with a never-incarcerated father. Moreover, respondents whose father has ever been imprisoned are more likely to be disadvantaged on a variety of social indicators. They are more likely to be racial and ethnic minorities, less likely to have grown up with both biological parents, and report poorer physical and mental health. Additionally, these respondents exhibit higher levels of serious delinquency, drug use, and impulsivity, and lower levels academic achievement.

Results

The first set of results involves a series of nested logistic regression models estimating the relationship between paternal and young adult incarceration (Table 2). Our baseline estimate (Model 1), which controls only for paternal incarceration, demonstrates that the odds of incarceration for a respondent with an ever-incarcerated father are 2.58 times greater than for a respondent with a never incarcerated father. This translates to a 14% increase in the probability of incarceration[1].

The subsequent models introduce our controls in stepwise fashion. Model 2 adjusts for individual and family background characteristics. After controlling for contextual (age, SES,

[1] In order to calculate the marginal probability for the "average" case in our sample, we performed an inverse-logit transformation on our linear prediction, by first calculating the probability that all respondents in the sample have a never-incarcerated father. We then calculated the probability that all respondents in the sample have an ever-incarcerated father. The probability of incarceration is the difference in the probabilities of these two groups (Williams 2012).

race) and neighborhood characteristics, paternal incarceration remains statistically significant, but the size of the coefficient declines by 13%. The inclusion of family process variables in Model 3 reduces the size of the coefficient on paternal incarceration by an additional 5%. In Model 3, respondents with an ever-incarcerated father are 2.19 times more likely to be imprisoned than those with a never-incarcerated father. This is an 11% increase in the probability of incarceration among respondents with an ever-incarcerated father. In Model 4, which adjusts for institutional attachment characteristics, the magnitude of this coefficient decreases by an additional 6%, indicating that these characteristics explain a small proportion of the relationship between paternal and young adult incarceration.

Finally, in our most complete model (Model 5), which includes individual psychological and behavioral characteristics, the magnitude of the paternal incarceration coefficient declines by an additional 14%. Nonetheless, paternal imprisonment remains a statistically significant and positive predictor of respondent incarceration. In sum, even after controlling for individual, familial, institutional, and neighborhood characteristics, young adults with an ever-incarcerated father are 1.89 times more likely to go to prison than respondents whose fathers have no incarceration history - a 9% higher probability of incarceration compared to respondents with never-incarcerated fathers.

In order to disentangle selection effects from outcomes associated with having an ever-incarcerated father, we turn to propensity score matching estimates (Table 3). Our results demonstrate that paternal incarceration is significantly and positively associated with offspring incarceration. The probability of incarceration among respondents attached to an ever-incarcerated father is 8% higher than those with a never-incarcerated father. Furthermore, the magnitude and significance levels of both the logistic regression and propensity score matching

estimates are similar, which suggests that paternal incarceration is a statistically significant predictor of incarceration in young adulthood, even after accounting for some of the effects of selection.

Although propensity score matching compares two similar groups based on observed characteristics, unobserved heterogeneity could also be driving these results. To address this challenge, we use Mantel-Haenszel bounds (Becker and Caliendo 2007), which assess how large unobserved factors would have to be to overestimate the "treatment" effect and render the relationship between paternal and offspring incarceration statistically insignificant. The results indicate that unobserved characteristics would have to increase the odds of receiving treatment by 50% to render this finding insignificant (Table 4).

Finally, we explore whether the association between paternal and young adult incarceration is differentiated by race/ ethnicity (Table 5). We find that paternal incarceration is a strong predictor of imprisonment for whites, African Americans, and Hispanics, even after controlling for a wide range of covariates. The probability of incarceration is approximately 7%, 5% and 10%, respectively, among these three racial/ ethnic groups. In order to determine whether there are statistically significant differences in the magnitude of the coefficients between subgroups, we use a methodological test advanced by Clogg, Petkova, and Haritou (1995)[2]. The results show no statistically significant differences in the effects of paternal incarceration across subgroups, which suggests that paternal incarceration is equally detrimental across these racial/ethnic groups.

[2] In order to compare coefficients between groups, we calculate the p-value using the following formula: $p = (\beta(white)-\beta(black))/[s2(white)+s2(black)]1/2$. We use variations of this formula to calculate differences between all groups.

At the same time, there are substantive differences in the predictors of incarceration by race/ethnicity. For instance, among white Americans, the magnitude of the coefficient for prior arrest history is nearly 2.5 times greater than the effect of paternal incarceration, and nearly 3 times greater for Black Americans. Yet, among Hispanics, this figure is comparably lower, at 1.5. Additionally, certain family (parental abuse and supervision) and individual (depression, impulsivity) factors are significant predictors among whites, but not among either Blacks or Hispanics.

Finally, Table 3 examines racial differences in the effects of paternal incarceration using propensity score matching. These largely confirm the findings in our logistic regression models, with paternal incarceration remaining a strong significant predictor of incarceration across all three racial/ethnic groups. Among whites, there is an approximately 8% increase in the probability of incarceration among respondents with ever-incarcerated fathers. Unobserved characteristics would have to increase the odds of treatment by 20% to render this finding statistically insignificant. For Blacks, having an ever-incarcerated father increases the probability of incarceration by 4%. However, in assessing the sensitivity of this estimate, results indicate that this finding is not robust to unobserved selection factors. This suggests that a modest degree of selection factors would render the relationship insignificant among Blacks. Among Hispanics, there is a 10% increase in the probability of incarceration among respondents with an ever-incarcerated father. Unobserved characteristics would have to increase the odds of treatment by 10% to render this finding statistically insignificant.

Discussion

Given the increasing prevalence of young adults who have ever had a parent in prison (Western and Wildeman 2008), coupled with a growing awareness of the detrimental effects of parental imprisonment on children (Bocknek et al. 2008; Foster and Hagan 2009; Geller et al. 2009; Schwartz-Soicher et al. 2011; Wakefield and Wildeman 2011), there is an urgent need to understand the social consequences of incarceration not only for individuals in the present, but the extent to which these consequences persist over time and across generations. Extant research in this area has shown that incarceration exacerbates inequality, compounding the barriers to opportunity experienced by those who are already disadvantaged, particularly lesser-educated African American men (Wildeman and Western 2010).

Other work has expanded this focus to examine the intergenerational transmission of criminal justice involvement, but has focused largely focused on delinquency and arrest (Roettger and Swisher 2011; Swisher and Roettger 2012). However, incarceration is one of the most extreme manifestations of contact with the criminal justice system; it is ultimately experienced by only a fraction of those who ever have contact with law enforcement, and, as discussed above, it has considerable consequences for individuals and their families. Accordingly, we address an important gap in the literature by focusing specifically on intergenerational patterns of incarceration.

Our analysis uses Add Health data and multiple estimation techniques to examine whether having an ever-incarcerated father is a predictor of an individual's own subsequent incarceration in young adulthood. Our analyses proceeds in two stages. We begin by exploring our research question with the entire sample, first by using logistic regression and then by leveraging propensity score matching to eliminate some of the effects of selection bias. In the

second stage, we use these same techniques to determine if the association between paternal and young adult incarceration varies between different racial/ ethnic groups.

In the first stage of the analysis, our logistic regression model shows that, even after controlling for a strategic set of individual, family, and neighborhood controls, the odds of going to prison for young adults with an ever-incarcerated father are 1.89 times larger than for those with a never-incarcerated father. In addition, the magnitude of the coefficient on paternal incarceration ($\beta = 0.638$) is fourteen times larger than that on neighborhood poverty ($\beta = 0.044$), eight times larger than the effect of family socioeconomic status ($\beta = -0.074$), and seven times larger than the effect of past delinquency ($\beta = 0.081$). Paternal incarceration is also a stronger predictor of a young adult's own imprisonment than prior drug use ($\beta = 0.587$) and being African American ($\beta = 0.239$) or Latino ($\beta =0.162$). Only prior arrest ($\beta = 1.5$) is a stronger predictor of young adult imprisonment. Having an ever-incarcerated father thus has a greater association with a young adult's own incarceration than any of these individual, family, school, or neighborhood factors, with the exception of past arrest. Furthermore, the cumulative effects of these controls still do not fully explain the role of paternal incarceration in predicting a young adult's imprisonment.

Results from propensity score matching lend support to our regression findings, indicating that, even after reducing selection bias, respondents with an ever-incarcerated father are still 1.08 times more likely to, themselves, be imprisoned than those with a never-incarcerated father. These findings both support and extend previous work indicating that paternal incarceration is a predictor of a young adult's own involvement in the criminal justice system (Roettger and Swisher 2011; Swisher and Roettger 2012).

In the second stage of the analysis, we assess whether the effect of paternal incarceration on criminal justice involvement is differentiated by race and ethnicity. We find that there are no statistically significant differences in the effect of paternal incarceration across racial/ethnic groups. Again, our results support both quantitative (Roettger and Swisher 2011) and qualitative research (Giordano, 2010) which indicates that paternal incarceration has similar outcomes for different racial groups.

On the other hand, there are also important differences in the predictors of incarceration for each of these groups. Specifically, some family characteristics (parental abuse, lack of parental supervision), individual attributes (depression), and neighborhood factors (proportion of non-white families) are statistically significant predictors of incarceration among whites, but not for Blacks or Latinos. Nonetheless, across racial/ ethnic groups, young adults with an ever incarcerated father are from lower socioeconomic status families, less likely to have grown up with both biological parents, and reside in minority-concentrated neighborhoods. Although few quantitative studies have examined differences in predictors of incarceration by race and ethnicity, it is possible given that, among non-Hispanic whites, incarceration is a non-normative occurrence, these factors are more salient in predicting incarceration. Future research could explore these variations in the predictors of incarceration by race and ethnicity.

Limitations

There are several methodological limitations to consider in addressing these findings. First, the measurement of paternal incarceration may be vulnerable to retrospective reporting bias, in that Add Health data does not distinguish between the timing and duration of incarceration. Second, the school-based sampling frame may under-sample respondents who are

likely to be incarcerated and to be attached to a father with an incarceration history. Third, despite using propensity score matching to minimize the effects of selection, we cannot make causal claims about the effect of paternal incarceration on a young adult's subsequent imprisonment. A model using more conservative assumptions, such as a fixed-effect model, would be needed to control for within-in person changes, while reducing unobserved heterogeneity in order to better address selection into incarceration.

Moreover, our analysis has substantive limitations, as well. Although our analysis demonstrates that the relationship between paternal and young adult incarceration persists, even after including a robust set of individual, familial, and neighborhood controls, it does not allow us to adjudicate among the major prevailing perspectives (e.g. economic strain, stigma, and socialization) to explain this relationship. Thus, while we show that the experience of having an incarcerated father is unique in its association with later young adult imprisonment, we do not attempt to answer *why* it is so unique. Future work could more specifically address the actual mechanisms linking paternal and young adult incarceration.

Conclusion

In sum, our study fills a gap in the current literature by empirically demonstrating that having an ever-incarcerated father increases the odds of a young adult's own imprisonment. In doing so, we contribute to the growing body of literature linking paternal imprisonment to detrimental outcomes among children, and, in particular, to their ultimate involvement in the criminal justice system.

Additionally, our analysis makes two specific contributions. First, these findings have implications for our understanding of the endurance of child outcomes associated with paternal

incarceration. While most work has focused on the consequences of a parent's imprisonment on early child development, our results suggest that the effects of having an ever-incarcerated father persist into young adulthood. Second, and more generally, our findings indicate that incarceration must not only be seen as both a *stratified* and *stratifying* process – in which already-marginalized groups experience a disproportionate at risk of incarceration and, following imprisonment, experience further cumulative disadvantage. Rather, paternal imprisonment must also be conceptualized as an *intergenerationally* stratifying process, transmitting the experience of incarceration – and, by association, of disadvantage and marginalization - from one generation to the next. As a result, it is crucial that scholars and policy-makers alike conceptualize intergenerational patterns of imprisonment as part of the full "ledger" (Sampson, 2011) of incarceration.

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Table 1. Descriptive Statistics for Variables Used in Analysis

	Full Sample		Ever Incarcerated fathers		Never Incarcerated Fathers		
	Mean	SE	Mean	SE	Mean	SE	
Paternal Incarceration	.185		1.000		0		***
Offspring Incarceration	.155		.292		.124		***
Demographic and Neighborhood Characteristics							
Non-Hispanic White	.661		.571		.681		***
Non-Hispanic Black	.148		.223		.131		***
Hispanic	.117		.140		.112		***
Other race/ethnicity	.072		.065		.073		***
Age	14.988	(.023)	14.889	(.051)	15.010	(.025)	*
Resides with both biological parents	.613		.351		.671		***
Family Socioeconomic Status	5.489	(.037)	4.462	(.041)	5.723	(.074)	***
Female	.496		.492		.497		
Foreign-born	.053		.037		.056		*
Proportion of non-white families in census tract	.124		.193		.108		***
Proportion of families in poverty in census tract	.236		.278		.226		**
Census tract density (individuals/square kilometer)	.087	(.002)	.084	(.003)	.088	(.002)	
Family Process Characteristics							
Biological mother's history of binge drinking/alcholism	.036		.068		.029		***
Paternal Closeness							
Not close at all/no biological father	.102		.087		.170		***
Not very close	.052		.044		.085		***
Somewhat close	.139		.130		.179		***
Quite close	.242		.246		.223		***
Very close	.463		.491		.341		***
Father involvement	.561		.380		.602		***
Biological father unknown	.055		.078		.050		**
Abuse by parent	.078		.126		.067		***
Daily family meals	.522		.451		.539		***
Parental supervision	3.457		3.431	(.039)	3.464	(.018)	
Adolescent School Attachment							
School attachments	2.230	(.012)	2.336	(.028)	2.205	(.013)	***
Grade Point Average	2.818	(.011)	2.585	(.025)	2.871	(.012)	***
Time spent hanging out with friends	1.998	(.014)	2.107	(.032)	1.973	(.015)	**
Religious attendance	2.741	(.017)	2.571	(.040)	2.780	(.018)	***
Individual Behaviors							
Physical Health	2.121	(.012)	2.287	(.031)	2.083	(.013)	***
Depression	.091		.126		.083		***
Impulsivity	2.987	(.015)	2.917	(.036)	3.000	(.017)	*
Ever Arrested	.123		.193		.107		***
Deliquency	1.042	(.034)	1.521	(.109)	.932	(.034)	***
Drug use	.360		.398		.352		**
Observations	12240		2349		9891		

Table 2. Logistic Regression Models Predicting Incarceration

	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	SE	β	SE	β	SE	β	SE	β	SE
Paternal Incarceration	.948 ***	(.057)	.821 ***	(.062)	.784 ***	(.063)	.739 ***	(.064)	.638 ***	(.068)
Demographic and Neigbhorhood Characteristics										
Race(ref=Non-Hispanic White)										
Non-Hispanic Black			.224 **	(.085)	.188 *	(.087)	.190 *	(.089)	.239 *	(.095)
Hispanic			.205 *	(.091)	.196 *	(.092)	.171 +	(.094)	.162	(.100)
Other race/ethnicity			.137	(.106)	.116	(.107)	.153	(.108)	.142	(.114)
Age			-.110	(.261)	-.142	(.263)	-.388	(.266)	-.401	(.282)
Age-squared			.003	(.008)	.004	(.008)	.011	(.008)	.013	(.009)
Resides with both biological parents			-.372 ***	(.059)	-.228 **	(.070)	-.203 **	(.071)	-.203 **	(.076)
Family Socioeconomic Status			-.074 ***	(.011)	-.071 ***	(.012)	-.048 ***	(.012)	-.074 ***	(.013)
Female			-1.43 ***	(.059)	-1.45 ***	(.060)	-1.35 ***	(.061)	-1.01 ***	(.068)
Foreign-born			-.572 ***	(.132)	-.557 ***	(.132)	-.462 ***	(.134)	-.296 *	(.140)
Proportion of non-white families in census tract			.079	(.074)	.080	(.075)	.077	(.076)	.139 +	(.081)
Proportion of families in poverty in census tract			.024	(.084)	.029	(.085)	.062	(.086)	.044	(.091)
Census tract density (individuals/square kilometer)			-.695 **	(.221)	-.747 ***	(.224)	-.932 ***	(.236)	-.976 ***	(.246)
Family Process Characteristics										
Biological mother's history of binge drinking/alcholism					.477 **	(.148)	.362 *	(.152)	.371 *	(.184)
Paternal Closeness (ref=not close at all)										
Not very close					.134	(.139)	.088	(.141)	.115	(.148)
Somewhat close					.196 +	(.111)	.190 +	(.112)	.176	(.12)
Quite close					.142	(.108)	.163	(.109)	.164	(.116)
Very close					.083	(.106)	.122	(.107)	.182	(.114)
Father involvement					-.150 *	(.068)	-.062	(.069)	-.058	(.073)
Biological father unknown					.117	(.111)	.092	(.112)	.025	(.119)
Abuse by parent					.311 ***	(.089)	.324 ***	(.091)	.120	(.098)
Daily family meals					-.276 ***	(.059)	-.212 ***	(.060)	-.147 *	(.064)
Parental supervision					-.030	(.024)	-.022	(.025)	-.039	(.026)
Adolescent School Attachment										
School attachments							.088 **	(.032)	.006	(.035)
Grade Point Average							-.476 ***	(.039)	-.389 ***	(.043)
Time spent hanging out with friends							.114 ***	(.029)	.038	(.031)
Religious attendance							-.037	(.024)	.002	(.026)
Individual Behaviors										
Physical Health									.012	(.033)
Depression									.387 ***	(.098)
Impulsivity									-.080 **	(.027)
Ever Arrested									1.500 ***	(.074)
Deliquency									.081 ***	(.012)
Drug use									.587 ***	(.064)
Constant	-2.020 ***	(.031)	1.440	(2.000)	1.920	(2.030)	4.480 *	(2.060)	3.470	(2.190)
Observations	12091		12091		12091		12091		12091	

+p<.10 *p<.05 **p< .01 ***p<.001

Table 3. Propensity Score Matching Models Predicting Incarceration

Full Sample		Non-Hispanic White		Non-Hispanic Black		Hispanic	
β	SE	β	SE	β	SE	β	SE
.078 ***	(.013)	.075 ***	(.019)	.040 ***	(.027)	.103 ***	(.033)

Table 4. Results from Sensitivity Analysis for Average Treatment Effects (Assuming Overstimation of the Treatment Effect)

Full Sample		Non-Hispanic White		Non-Hispanic Black		Hispanic	
Gamma	*p*	Gamma	*p*	Gamma	*p*	Gamma	*p*
1.00	<.001	1.00	<.001	1.00	.072	1.00	.005
1.10	<.001	1.10	.003	1.10	—	1.10	.020
1.20	<.001	1.20	.025	1.20	—	1.20	.055
1.30	<.001	1.30	.097	1.30	—	1.30	.121
1.40	.004	1.40	.244	1.40	—	1.40	—
1.50	.037	1.50	—	1.50	—	1.50	—
1.60	.155	1.60	—	1.60	—	1.60	—

Note: All p-values based on one-sided significance tests.

Table 5. Logistic Regression Models Predicting Incarceration by Race/Ethnicity

	Non-Hispanic White		Non-Hispanic Black		Hispanic	
	β	SE	β	SE	β	SE
Paternal Incarceration	.658 ***	(.101)	.429 **	(.133)	.908 ***	(.162)
Demographic and Neigborhood Characteristics						
Age	-.540	(.415)	-.350	(.570)	-.435	(.667)
Age-squared	.018	(.013)	.011	(.019)	.015	(.021)
Resides with both biological parents	-.219 *	(.106)	-.172	(.170)	-.143	(.184)
Family Socioeconomic Status	-.076 ***	(.018)	-.086 ***	(.026)	-.074 *	(.034)
Female	-.940 ***	(.097)	-1.160 ***	(.138)	-1.170 ***	(.175)
Foreign-born	-.571	(.501)	-.178	(.547)	-.368 +	(.199)
Proportion of non-white families in census tract	.404 **	(.147)	.084	(.155)	.062	(.158)
Proportion of families in poverty in census tract	-.085	(.181)	-.057	(.138)	.363 +	(.203)
Census tract density (individuals/square kilometer)	-1.630 **	(.610)	-.604	(.489)	-1.09 **	(.398)
Family Process Characteristics						
Biological mother's history of binge drinking/alcholism	.237	(.203)	.397	(.345)	.548	(.376)
Paternal Closeness (ref=not close at all)						
Not very close	.420 +	(.226)	-.208	(.286)	-.481	(.394)
Somewhat close	.417 *	(.190)	.008	(.209)	.206	(.307)
Quite close	.310 +	(.185)	.111	(.211)	.296	(.293)
Very close	.295	(.184)	.174	(.199)	.316	(.286)
Father involvement	-.048	(.102)	-.292 +	(.165)	-.155	(.178)
Biological father unknown	.189	(.19)	-.235	(.203)	.380	(.293)
Abuse by parent	.322 *	(.136)	-.050	(.221)	-.137	(.245)
Daily family meals	-.134	(.091)	-.326 *	(.139)	.047	(.160)
Parental supervision	-.095 *	(.040)	.063	(.051)	-.094	(.059)
Adolescent School Attachment						
School attachments	.013	(.050)	.082	(.072)	-.065	(.092)
Grade Point Average	-.397 ***	(.060)	-.314 ***	(.095)	-.356 ***	(.107)
Time spent hanging out with friends	.049	(.045)	.032	(.060)	.098	(.077)
Religious attendance	-.006	(.037)	-.026	(.054)	.050	(.064)
Individual Behaviors						
Physical Health	.016	(.049)	-.059	(.064)	.014	(.081)
Depression	.490 ***	(.143)	.469 *	(.191)	.138	(.241)
Impulsivity	-.107 **	(.038)	.001	(.054)	-.110	(.068)
Ever Arrested	1.610 ***	(.101)	1.270 ***	(.166)	1.360 ***	(.192)
Deliquency	.084 ***	(.017)	.092 ***	(.022)	.079 *	(.031)
Drug use	.629 ***	(.090)	.527 ***	(.134)	.644 ***	(.164)
Constant	4.330	(3.220)	3.460	(4.390)	3.920	(5.230)
Observations	6469		2478		1878	

+p<.10 *p<.05 **p< .01 ***p<.001