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Intergenerational Educational Effects of Mass Imprisonment in America

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Abstract

In some American schools, about a fifth of the fathers have spent time in prison during their child's primary education. We examine how variation across schools in the aggregation and concentration of the mass imprisonment of fathers is associated with their own children's intergenerational educational outcomes and "spills over" into the attainments of other students. We assess the association of this interinstitutional and intergenerational "prison through school pathway" with downward and blocked educational achievement. Educational and economic resources and other predisposing variables partially explain school-linked effects of paternal imprisonment on measures of children's educational outcomes. However, we find that the net negative school-level association of paternal imprisonment with educational outcomes persists even after we introduce school- and individual-level measures of a wide range of mediating processes and extraneous control variables. We discuss paternal imprisonment as a form of "marked absence." The significance of elevated levels of paternal imprisonment in schools is perhaps most apparent in its negative association with college completion, the educational divide that now most dramatically disadvantages individuals and groups in American society.

Keywords

achievement, adolescents, incarceration, schools, students

THE EFFECTS OF MASS IMPRISONMENT

David Garland (2001b:1) coined the term *mass imprisonment* to describe the twenty-first-century penal confinement of more than 2 million Americans, which he calls ''an unprecedented event in the history of the USA and, more generally, in the history of liberal democracy.'' The United States constitutes about one twentieth of the world's population, but our jails and prisons hold about one quarter of the world's inmates (Blumstein 2007). Garland's mass imprisonment concept highlights both the overall aggregate size and the selectively concentrated form of this confinement. ''Imprisonment becomes mass imprisonment,'' Garland (2001b:1) observes, ''when it ceases to be the incarceration of individual offenders and becomes the systematic imprisonment of whole groups of the population'' (see also Garland 2001a; Simon 2007; Wildeman 2009).

The groups incarcerated are increasingly described in education-related terms. Thus, Pettit and Western (2004; Western 2006) report that nearly two thirds of black male high school

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dropouts in their 30s have spent time in jail or prison and that black males of this age are more likely to have been incarcerated than to have gone to college. In an earlier era, military service was a potential turning point experience available even to youth caught up in the criminal justice system and the GI Bill provided educational opportunities for veterans (Sampson and Laub 1995). However, for minority men incarceration is today much more likely than military service to mark the transition to adulthood and derail their educational prospects.

Clear (2007:68) extends this perspective by noting that mass incarceration is so spatially concentrated in neighborhoods and schools that "we can think of these sites as 'prison places.'" Neighborhoods and schools can themselves take on characteristics of prisons (Sander 2010). Police in inner-city schools often patrol entrances, hallways, and exits much like prison guards (Tuzzolo and Hewitt 2006-2007). Schools can play a preparatory role for incarceration (e.g., Fenning and Rose 2007), and as a result there is a burgeoning research literature on the "school to prison pipeline" (Sander 2010). This literature identifies the ways in which a punitive orientation to crime in America has brought the police directly into schools to enforce zero tolerance disciplinary policies (Solomon 2004) and integrate information and control systems placing youth at increased risk of justice system contact and ultimately incarceration (Christle, Jolivette, and Nelson 2005; Hirschfield 2008; Kupchicka and Monahan 2006).

Research in the sociology of education more broadly reveals how school disinvestment policies influence risks of educational failure and other disadvantaging outcomes—including incarceration—in adulthood (Arum and Beattie 1999; Arum and LaFree 2008). Yet relatively little is known about how expanded incarceration—which increasingly includes parents—influences the educational outcomes of children (Cho 2009; Foster and Hagan 2007, 2009; Friedman and Esselstyn 1965; Stanton 1980; Trice and Brewster 2004). We argue that the intergenerational connection of parental incarceration to the educational outcomes of children is an underrecognized interinstitutional process linking prisons to schools in America.

More than half of state prisoners and nearly two thirds of federal prisoners are parents, and the number of imprisoned parents markedly increased from 1991 to 2007 (Comfort 2008; Glaze and Maruschak 2008; Mumola 2000). More than 2 million children, constituting about 3 percent of the U.S. population under 18, have a parent incarcerated (Hagan and Dinovitzer 1999; Wakefield and Uggen 2010; see also Lynch and Sabol 2004; Murray and Farrington 2008; Rose and Clear 1998). We therefore examine in this article how incarceration may be a barrier not only for imprisoned parents but for the education of their children as well.

We give new attention to the educational fates of students who attend "high incarceration schools"—that is, schools with high proportions of incarcerated parents. Wakefield and Uggen (2010:400) insist that "conventional wisdom to the contrary, we can no longer think of prisoners as isolated loners or of the prison as isolated from other social structures." Parental incarceration is commonplace in many schools and may have significant intergenerational consequences for children (Sampson and Loeffler 2010). Clear (2007:102) emphasizes that "the potential negative impact of incarceration on school performance is particularly important," and there is growing evidence of the negative implications of paternal incarceration at the level of individual students (Foster and Hagan 2007). Research on imprisoned fathers builds on associations also observed between maternal incarceration and children's school problems (Cho 2010; Stanton 1980; Trice and Brewster 2004; cf. Cho 2009). These studies support the observation that mass imprisonment is a form of what Pager (2003, 2007) calls "marking" or "negative credentialing."

Yet we know little about further "spillover" implications of mass incarceration in America. Empirical research is developing on community contexts (Clear 2007; Sampson and Loeffler 2010), but studies that give attention to variation in mass incarceration across schools are rare (Cho 2011). Paternal incarceration is a mass American phenomenon, and as social scientists we should be looking for the contextual effects and collateral consequences of this penal policy for schools and children.

We know little about the mechanisms by which elevated school levels of parental imprisonment potentially impact children's educational attainments—even beyond the children whose own parents are incarcerated. Sharkey (2008:935) makes this point more broadly in

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observing how little we know about how collective neighborhood effects exercise their influence, remarking that "evidence on the *mechanisms* leading to the persistence of wealth and poverty across generations is still sparse" (emphasis in original). We ask in this article whether inequalities resulting from mass incarceration of parents flow through families and "spill over" through schools to increase educational inequality among the children of succeeding generations. Assessing the potential operation of this interinstitutional and intergenerational "prison through school pathway" is a step toward unpacking mechanisms of downward and blocked mobility in American society.

INTERGENERATIONAL STUDENT AND SCHOOL EFFECTS OF IMPRISONING PARENTS

High school environments form settings in which "defining moments" of failure or success can have long-lasting educational influences over the life course (Arum and Beattie 1999). Although there is a well-established literature on the effects of variations in conventional school contexts on educational outcomes (e.g., Cohen et al. 2009; Condron 2009; Kearney 2008; Raudenbush 1988), there is little or no empirical attention in this literature to the school-based contextual impact of parental incarceration on school environments as a potentially important interinstitutional and intergenerational source of disadvantaging educational outcomes.

Our expectation is that the contextual effect of the heightened aggregation and concentration of incarcerated fathers is extending beyond prison walls and families to the classrooms and schools where children are educated. When heightened levels of paternal incarceration are concentrated in schools and classrooms, they can create collective contextual ecologies that "spill over" beyond those who directly experience the parental incarceration. Drawing on Sharkey's (2008, 2010; see also Leventhal and Brooks-Gunn 2000) work on neighborhoods and children's cognitive performance, we suggest several perspectives from which to view school-level as well as individual-level parental incarceration and the educational outcomes of children. Like Sharkey, our contribution is to assess the connection across generations between places—more specifically, schools—and persons—in our case, incarcerated fathers and their children. We similarly seek to assess the general hypothesis that the aggregation and concentration of incarcerated parents in particular school settings is associated with intergenerational limitations of educational mobility.

Sharkey's (2008, 2010) work connects with several perspectives specifying mechanisms that may also be involved in the interinstitutional and intergenerational prison through school pathway that we examine. The first perspective focuses on parent–child relationships and the absence of parent figures. The residential removal of the parent from the community is one mechanism of social disorganization identified with this perspective. However, more may be involved than the father's disappearance. Pager's (2007) concept of marking and negative credentialing adds to the residential mobility mechanism a related concern that a father's imprisonment creates a "marked absence" in socially stereotyped and social-psychological terms. So both mechanisms of residential mobility and stigmatic stereotyping may be involved in a father's incarceration.

Our thesis is that the implications of this mobility and marking extend beyond the incarcerated parent. Parent–child relationships play primary and formative roles in establishing connections within the family and set a foundation for building secondary relationships outside the family. W. J. Wilson (1996) and Anderson (1990) emphasize that the absence of fathers from communities as well as families compounds forces of both social isolation and stigmatization while further confining cognitive landscapes and perceived pathways to educational and other attainments (Sampson and Wilson 1995). Elder (1994) highlights the importance of parental relationships and figures outside the home in forming "linked lives" that establish and sustain educational and other kinds of transitions and trajectories in the movement from adolescence to adulthood.

High concentrations of incarcerated parents in schools may lead to the diminished capacity of disrupted families to monitor school attendance and nurture levels of school performance necessary to serve as stepping stones to higher education and as springboards to successful educational attainment. Teachers may regard children of incarcerated parents as having poor educational prospects and lower levels of competence (Dallaire, Ciccone, and Wilson 2010; Friedman and Esselstyn 1965). The difference, of course, is the scale at which these marked absences

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resulting from incarceration now occur in families, neighborhoods, and schools across America. The influence of paternal incarceration can flow both at the individual level within families and at the school level through teachers and among students who are influenced not only by their own father's incarceration but also by the spillover influence on the families of others. The absence of incarcerated fathers in this sense can individually and collectively mark children for educational as well as other forms of failure.

The second perspective on parental incarceration effects on children's educational achievement emphasizes reductions in economic and educational resources (e.g., Jencks 1972). These resources can both stimulate and support transitions and trajectories of educational achievement, and the absence of these resources can correspondingly weaken key links in educational trajectories. Again, the effects of the presence or absence of these resources can operate at both the individual and school levels. That is, these resources can have both individualized and collective expressions at the person and school levels.

Parents are thus a key resource that can elevate or diminish the collective efficacy of schools as socially supportive learning environments. The removal of imprisoned parents leaves single or surrogate caregivers with added parenting burdens, and in turn these single and surrogate parents can provide less assistance and be less of a presence in schools (Vacha and McLaughlin 1992). Clear (2007:102) theorizes that families disrupted by imprisonment increase the risk of family and student disengagement from school, whether resulting from the need to assume surrogate parenting responsibilities or the necessity to earn replacement income (see also McLanahan and Sandefur 1994; Trice and Brewster 2004; see also Casas-Gil and Navarro-Guzman 2002).

We incorporate a variety of measures of the economic and educational resources of individuals and schools in this article, for example, including not only a measure of the father's college completion and household income, but also the school-level proportion of college-educated fathers and a five-item factor-analyzed index of concentrated school-level socioeconomic disadvantage. These measures, and others indicated in the following, can capture spillover effects resulting from the collective advantages or disadvantages created by the clustering within schools of parents who have similar incomes and connected resources to invest in their children's educational environment.

A more abstract unifying perspective on the mechanisms that both Sharkey and Clear et al. propose in their related work on neighborhoods involves their broadened attention to weakened social ties, networks, and associations. For Clear et al. (2006:39) the problem is most prominently one of "coercive mobility" that takes persons from neighborhoods with results that reduce informal social controls on those who remain: "The theory, then, is that coercive mobility affects those who remain through networks of associations." Sharkey (2008:939) observes that "a general mechanism leading to continuity in the neighborhood environment is the set of ties, both social and psychological, that connect individuals to places." Neither Clear nor Sharkey directly measure these network ties of association, but both indirectly assess network assumptions about hypothesized relationships and resources operating in disadvantaged neighborhood outcomes.

Both the relationship and resource perspectives with their assumptions about network ties are further expected to unfold in their consequences over stages of the life course. Sharkey's (2008) analysis suggests that at the neighborhood or school level there is relatively limited variation in surrounding circumstances confronting students from childhood through adolescence and in the transition to adulthood. Thus, individual circumstances involving parental imprisonment may vary, but the collective circumstances of many schools and neighborhoods, especially in recent decades, have simply varied from bad to worse, exposing youth in these schools to increasingly and persistently unfavorable environments. The important additional implication of the focus on spillover effects is to call attention at the broader interinstitutional level of schools to the policy consequences for families surrounding those who have fathers incarcerated.

The model we explore depicts a multilevel and cumulative process of educational attainment. Similarly, Clear (2007:146) draws on his qualitative ethnographic field work to describe the family- and neighborhood-based interdependencies that are associated with paternal imprisonment and played out in neighborhoods and schools in ways that he emphasizes go well beyond the incarcerated parent.

> Our participants described unparented children, unsupervised young people, and

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> struggling single mothers as symptoms of incarceration, and these problems existed in abundance in their neighborhoods. The human capital of anyone who was dependent on a person headed to prison is damaged by their removal, and this damage was seen as systemic, especially in family life. The women and children who remain behind face uphill battles in sustaining a decent quality of life. The lack of a positive self-image and hopes for the future and unmanageable children who stopped going to school in intergenerational trouble with the law were seen as products of missing fathers and weak parental control. There was a sense in which our participants saw their whole neighborhood as marginally poorer, directly as a result of the large number of men who were occupying prison cells instead of living productive lives.

Our point is that the school settings located within these ''high incarceration neighborhoods'' (Sabol and Lynch 2003) form high-risk social contexts for adolescents who in any case struggle to make successful educational transitions to a stable adulthood. In sum, the effects of paternal incarceration in damaging educational trajectories of children may play out over the length of the life course and may be imposed through the environmental influence of families at the level of schools as much or more as within the families themselves.

However, it is essential to further acknowledge an alternative perspective that we must simultaneously take into account in assessing effects of the incarceration of parents: This alternative approach focuses on predisposing conditions of selection and self-control. This perspective indicates that exogenous processes predate and can account for endogenous correlations of paternal incarceration with intergenerational outcomes. More specifically, this perspective emphasizes that exogenous processes of selection and involving weak self-control make incarcerated parents, their schools, and their children different from parents, schools, and children with less or no imprisonment. That is, this selection and self-control perspective argues that incarcerated parents, their schools, and their children have traits that predispose their fates and that these predisposing traits therefore account for the reduced educational attainments of these children. Of course, it is also plausible that selection and self-control variables are structurally and ecologically rooted, and so these variables are not necessarily only indicators of self-selection. This means our treatment of these variables as potential sources of spuriousness constitutes a conservative estimation of the impact of incarceration. We intend our treatment of these variables to provide a strong test of the influence of parental incarceration at student and schools levels.

The selection and self-control perspective comes in several forms. M. Gottfredson and Hirschi (1990) identify personally persistent and pervasive predispositions as low self-control that often results from ineffective parenting of children; J. Q. Wilson and Herrnstein (1985) refer to high impulsivity and low conscience with more ambiguous sources; while biological criminologists point to a physiological propensity for criminal offending perhaps resulting from low autonomic nervous system conditionability or biochemical imbalances (Fishbein 1990). While differing in their labeling of the predispositions, these formulations agree that a stable and versatile range of outcomes including parental imprisonment and school and child educational failure are products of common causes and resulting processes of self-selection. The result, as M. Gottfredson and Hirschi (1990:119) observe, is that ''people . . . sort themselves and are sorted [i.e., selected] into a variety of circumstances.'' We use a range of micro- and macro-level controls—including self-reported delinquency, area crime rates and neighborhood drug problems, fathers with college degrees, school attendance levels, and further variables described in the following—to assess the self-selection hypothesis within the multilevel models we estimate.

Thus, we seek to assess whether the relationship and resource problems we emphasize operate beyond the effects of the alternative explanatory variables and putative selection processes just described. We are particularly focused in this article on demonstrating the robustness of the school-level association of paternal incarceration with children's educational attainments. In particular, if our multilevel interinstitutional perspective on intergenerational prison–school pathways is correct, we should find that the association of educational outcomes with school-level parental incarceration is statistically significantly independent of students' individual-level experiences of parental imprisonment and other parental risk factors

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that may lead to penal confinement. Our point is not to deny the influence of selection processes or economic and educational resources, but rather to take them into account while assessing the robustness of the association between paternal incarceration and the diminished educational outcomes of children.

METHOD AND DATA

We use the first four waves of the National Longitudinal Study of Adolescent Health (Add Health; Harris, 2009) and a supplementary collection of educational data from school transcripts—the Adolescent Health and Academic Achievement supplement to the Add Health survey (AHAA; Muller et al. 2007)—to assess the hypothesized school-level effects of parental incarceration on child educational outcomes. A major attraction of the Add Health study for this research is that it includes a large number of U.S. communities with extensive information collected on individual respondents, their parents, and their schools. The Add Health survey began in 1995 with adolescents sampled in a stratified design from grades 7 to 12 and nested within 132 U.S. schools (Harris et al. 2009; Udry and Bearman 1998; see also Resnick et al. 1997).

The Add Health research design ensures the national representativeness of this sample of youth who were in school in its first wave in terms of region of the country, urbanicity, school size, school type, and ethnicity (Harris et al. 2009). The study began with an in-school survey and then randomly sampled students from the schools who participated in the in-home survey. The in-home sample was followed longitudinally and had response rates of 78.9 percent at wave 1, 88.2 percent at wave 2, 77.4 percent at wave 3, and 80.3 percent at wave 4 (Harris et al. 2009). In 1995, or wave 1, students at average age 15 were tracked for in-home interviews along with a parent, and adolescents were followed up at wave 2 in 1996. A third wave of data (2001-2002) followed up respondents at the average age of 21 years (ranging from 18 to 26 years of age), and a fourth most recent wave (2007-2008) again surveyed respondents at an average age of 27 years (ranging from 24 to 32 years old). Approximately 91 percent of wave 3 respondents signed a release form for collection of supplementary school transcript data (Muller et al. 2007). Our analyses use information from the four wave in-home Add Health longitudinal sample and additional transcript information from the AHAA study.

We use hierarchical linear models (HLM; Raudenbush and Bryk 2002) to estimate variation in educational outcomes measured within and between the schools, with adjustments for nonindependence resulting from clustered sampling within schools through calculation of robust standard errors. We use the school weight at wave 1 as well as the longitudinal sample weight at Wave 4. We present descriptive information about the variables used in this analysis in Table 1 and the appendix.

Nearly 15 percent of the Add Health youth reported in wave 3 that their biological fathers "had served time in jail or prison." In wave 4, the respondents more specifically reported how old they were when their biological fathers first went to jail or prison. To establish temporal priority, we considered fathers who had been in jail or prison between their children's birth and when they were 12 years of age. Overall, 6 percent of the respondents reported that before they were 12 years of age their fathers had been in prison or jail. If the father was incarcerated before the child's birth, and not after, he was placed in the comparison group with unincarcerated fathers.

We aggregated responses on this biological father incarceration question within schools to create a school-level measure of paternal incarceration: the proportion of fathers who had served time in prison or jail before their interviewed child's 12th birthday. This proportion ranged from 0 percent to 20 percent in the weighted sample. In other words, in some of the sampled American schools about a fifth of the fathers had experienced incarceration during the respondent's early childhood. By using reports at the individual level of paternal imprisonment and the school-level measure of paternal imprisonment, we can estimate separately the individual- and school-level associations of paternal incarceration with children's educational outcomes (cf. Crosnoe and Riegle-Crumb 2007).

We consider three measures of educational attainment: (1) high school grade point average (GPA) measured on a four-point scale from the AHAA component of the Add Health Study, (2) a wave 4 measure at the average age of 27 of educational outcomes on a 13-point scale from completion of eighth grade to postbaccalaureate

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Table 1. Descriptive Statistics

	M	*SD*	Range
School characteristics (*n* = 122 schools)			
Biological father's imprisonment (ages 0-12)	.07	.04	.0 to .20
School concentrated disadvantage	.05	.71	−1.05 to −1.77
Neighborhood drug problems	1.49	.24	1.14 to 2.16
Total crime rate (per 100,000 population)	5,580.02	2,801.75	.0 to 14,124.13
School-level delinquency	4.18	.99	1.74 to 6.53
Proportion of fathers with college degree	.33	.17	.06 to .88
Average school attendance level	4.19	.90	1 to 5
School size	2.08	.72	1 to 3
Urbanicity of school[a]	.29	—	0 to 1
Public school[b]	.91	—	0 to 1
Number of full-time classroom teachers	55.44	32.97	5 to 182
Percentage of teachers with master's degree	48.46	25.45	0 to 95
Proportion Hispanic	.17	.19	0 to .92
Proportion African American	.23	.27	0 to .99
Adolescent characteristics (*n* = 4,745 adolescents)			
Cumulative grade point average	2.68	.81	0 to 4
Respondent's education level (wave 4)	6.06	2.13	1 to 13
Respondent obtained college degree (wave 4)	.39	—	0 to 1
Biological father's imprisonment (ages 0-12)	.06	—	0 to 1
Biological father has college education	.31	—	0 to 1
Biological father's alcoholism	.12	—	0 to 1
Perceived closeness with biological father	4.40	1.09	1 to 5
Biological father smokes	.61	—	0 to 1
Delinquency (wave 1)	3.93	4.73	0 to 45
Gender[c]	.55	—	0 to 1
Single parent family	.15	—	0 to 1
Hispanic[d]	.13	—	0 to 1
African American	.16	—	0 to 1
Asian American	.06	—	0 to 1
Other	.02	—	0 to 1
Age	15.20	1.57	11 to 20
Household income (wave 1)	49.67	42.26	0 to 870
Ever lived with father	.95	—	0 to 1

Note: Reference categories are as follows:
a. urban = 1; suburban/rural = 0.
b. public = 1; private = 0.
c. female = 1; male = 0.
d. Non-Hispanic white.

professional education, and (3) a wave 4 binary measure of college completion. The last measure specifically assesses the college/noncollege divide that has assumed growing importance in American society.

We considered a wide range of characteristics in addition to paternal incarceration as plausible additional influences on educational outcomes in our school-level analysis. We included access to a range of socioeconomic resources in an index measuring school-level concentrated disadvantage with five factor-analyzed items (with loadings between .6 and .9 and more fully described in the appendix) consisting of the proportion of households: (1) with incomes below $15,000 and (2) $25,000 according to census data, (3) in the lower quartile of incomes as reported by parents, (4) single parent families, and (5) black or

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African American families. We introduced as related measures of educational resources: the number of full-time teachers, the proportion of teachers with master's degrees, and public as contrasted with private school funding. We also included school-level measures plausibly reflecting the predispositions emphasized in the selection perspective on educational outcomes. For example, area crime rates, mean school level of self-reported delinquency, and neighborhood drug problems could be exogenous sources of both paternal imprisonment and reduced educational attainment. In addition, we also included measures of educational predispositions as indicated by the school-level proportion of fathers with college degrees, average daily school attendance, and the urbanicity of the schools.

To assess whether collinearity among the school-level measures might confound our results, we estimated models after removing highly correlated items from the school disadvantage scale (the correlation matrix and these models are available on request), and we estimated further equations that at the school level were reduced to include only father's imprisonment and proportion Hispanic and African American respondents along with the full array of student-level characteristics described previously (see Table 6).

We further included a wide range of variables at the individual level in estimating the aforementioned school-level effects. Perhaps most importantly, we controlled at the individual level for the father spending time in jail or prison before the child's age 12. We also included selection/predisposition measures of whether the father graduated from college, was alcoholic, and smoked. We further incorporated measures of whether the respondent ever lived with the biological father and the closeness as a child to the biological father. To parallel the school-level control for the selection/predisposition effects of area crime rate, we incorporated a self-report scale of delinquency at Wave 1. We further included an individual-level predisposition measure of single parent family status, as well as indicators of age, gender, and race/ethnicity. As an indicator of family economic resources at the individual level, we included a measure household income.

We estimate joined individual and school-level HLM equations for the three educational outcomes, using linear hierarchical models for the GPA and highest educational level completed and logit estimates for college completion. For example, we first estimate an individual-level equation separately for students in each school in the Add Health study, resulting in regression coefficients (for each predictor) and an intercept term representing the student-input adjusted school outcome for each of the outcome measures (with the continuous predictors centered on their means) for each school. Our within-school modeling of the continuous GPA outcomes thus takes the following form:

$$\text{Educational Outcome}_{ij} = \beta_{0j} + \Sigma \sum_{q=1} \beta_q X_{qij} + \varepsilon_{ij},$$

where β_{0j} is the intercept; X_{qij} is the value of covariate q associated with respondent i in school-level j; and β_q are the partial effects on the educational outcome of the school- and student-level explanatory variables. The error term, ε_{ij}, is the unique contribution of each individual, which is assumed to be independently and normally distributed with constant variance σ^2.

Second, we estimate the school-level equation in which the intercept terms for each school represent the dependent variable adjusted for student intake characteristics, and which we attempt to explain with school-level characteristics. This between-school equation thus takes the following form:

$$\beta_{0j} = \theta_{00} + \theta_{01}(\text{paternal imprisonment}) + \ldots + U_{0j},$$

where θ_{00} is school overall average educational outcome and θ_{01} is the regression coefficient of the effect of paternal imprisonment measured as a school-level mean score on overall school average educational outcome. The additional school-level covariate measures are as indicated previously. We standardized the preceding variables to place these school-level measures on a common metric. We tested for significant cross-level interactions with race/ethnicity (see Table 6). U_{0j} is the school-level error term, assumed to be normally distributed with a variance of τ. Because the model parameters are initially estimated separately for each school, the input characteristics

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are not assumed to have a constant effect across all schools, and this allows the HLM modeling to provide a more accurate representation of the complex multilevel error structure.

RESULTS

We initially estimate student- and school-level models of father incarceration in Table 2. The first of these models in Panels A and B confirm the expectation that African American (*Odds Ratio [OR]* = 1.87, $p < .01$) but not Hispanic (*OR* = 1.41, $p > .05$) students during their childhoods are significantly more likely to have fathers who are sent to jail or prison and that African American ($b = .13$, $p < .05$) but not Hispanic ($b = .08$, $p > .05$) youth are also significantly more likely to attend schools in which fathers are sent to jail or prison during the students' childhoods. The African American effects are reduced by introducing father's college education in the second models of Panels A and B, and at the school level this effect is reduced below statistical significance. However, being African American and having fathers without college education are both clearly associated with the risk of paternal imprisonment. This means that even if paternal imprisonment has similarly notable effects on the educational outcomes of both African American and other youth, the impact on African American youth will be broader because they are more likely to have fathers who are sent to jail or prison as well as to not be highly educated. These preliminary findings suggest the importance of exploring an interinstitutional prison through school pathway linking intergenerational outcomes.

We next use HLM 6.02 (Raudenbush et al. 2004) in Table 3 to estimate linear hierarchical models of student grade point averages cumulated from school transcripts at the end of high school. The intraclass correlation (ICC) from the baseline model in model 1 indicates 16 percent of the variance in GPA is between schools; this is reduced to 14 percent in model 2 with the introduction of the school-level measure of biological father's imprisonment before age 12. The addition of the school-level educational and economic resource measures of proportion fathers with college degrees and the factor scale of school concentrated disadvantage in model 3 reduces the ICC to 11 percent. Model 4 adds to the previous model all of the individual-level variables thought most likely to influence educational outcomes—in this case GPA—in addition to biological father's imprisonment.

A number of the respondents' individual-level characteristics in model 5 are predictive of GPA in the expected ways. Females ($b = .30$, $p < .001$), Asian Americans ($b = .16$, $p < .05$), youth perceived close to their fathers ($b = .03$, $p < .05$), with fathers having college degrees ($b = .33$, $p < .001$), and households with higher incomes ($b = .002$, $p < .001$) all have significantly higher GPAs. In contrast, African Americans ($b = -.19$, $p < .001$), having single parents ($b = -.10$, $p < .05$), with fathers who smoke ($b = -.16$, $p < .001$), and who self-report delinquency ($b = -.03$, $p < .001$) all have significantly lower GPAs. Beyond this, with all of these individual-level independent variables taken into account, the children of fathers who spent time in jail or prison have significantly lower GPAs ($b = -.18$, $p < .05$).

At the school level in model 5, net of the individual-level variables including father's incarceration, the school-level effect on average respondent GPA of biological fathers' incarceration is also negative and statistically significant ($b = -.07$, $p < .05$). Schools with higher concentrated disadvantage, drug problems, self-reported delinquency, and area crime rates are not significantly different in average GPA. The only school-level variable other than parental incarceration that is significant is average school attendance ($b = .10$, $p < .05$), with school attendance increasing GPAs. The implication with regard to paternal incarceration is that not only are children of imprisoned fathers likely to receive lower grades, but as well, other youth who themselves do not have fathers who are incarcerated but nonetheless are in these schools with higher incarceration of fathers also receive lower grades net of all other variables thus far considered at both individual and school levels.

We next used HLM to estimate linear hierarchical models in Table 4 of the highest level of education completed, as reported in wave 4 of Add Health when the respondents were now an average of 27 years of age. The intraclass correlation from the baseline model 1 presented in column 1 for respondent's education level at wave 4 indicates 15 percent of the variance in this outcome is between schools. Adding paternal

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Table 2. Structural Predictors of Father's Imprisonment and the Student and School Level of Analysis

A. Outcome: Father's imprisonment at student level[a]	1	2
Hispanic	1.41	1.23
	[.86-2.34]	[.74-2.05]
Black	1.87**	1.66*
	[1.23-2.86]	[1.09-2.52]
Asian	.38	.42
	[.14-1.02]	[.16-1.12]
Other[b]	.92	.86
	[.32-2.65]	[.29-2.51]
Biological father has college education		.20***
		[.12-.33]
Wald statistic	3.37*	13.62***
B. Outcome: Father's imprisonment at school level[c]		
Proportion of Hispanic students (std)[d]	.08	.02
	(.07)	(.07)
Proportion of African American students (std)[d]	.13*	.12
	(.07)	(.07)
Proportion of fathers with college degree		−.25***
		(.07)
Constant	−.05	−.05
	(.07)	(.07)
R^2	.02	.11
F statistic	2.45	6.22***

a. Logistic regression model.
b. Reference category: Non-Hispanic white.
c. Ordinary least squares regression model.
d. Standardized variable.

incarceration at the school level reduces the ICC to 8 percent. Adding further school predictors, the ICC is reduced to 4 percent.

Model 4 again includes all of the individual-level variables and the baseline set of school-level variables considered in the comparable model of the previous table. These variables again include the individual- and school-level measures of biological father's incarceration before respondent's age 12. Again, the incarcerated father variable is negative and significant as a predictor of achieving higher educational levels at both the individual ($b = -.39$, $p < .001$) and school levels ($b = -.30$, $p < .05$). Beyond this, there are some similarities and differences with the GPA models in the previous table. At the individual level, females ($b = .56$, $p < .001$), fathers having college degrees ($b = .96$, $p < .001$), and household income ($b = .01$, $p < .001$) repeat as positive individual-level predictors of achieving higher education levels, while self-reported delinquency ($b = -.04$, $p < .001$) is again a significantly negative predictor of higher education. Several other individual-level variables are now nonsignificant, although generally signed in the same direction as previously.

A number of new effects appear at the school level in model 5 for highest education level achieved. Proportion of fathers with college degrees ($b = .19$, $p < .05$) now has its expected positive effect on achieving higher education. While father incarceration is slightly reduced at the school level, it retains high statistical significance ($b = -.27$, $p < .001$). Beyond this, number of full-time teachers ($b = .18$, $p < .05$) and teachers with master's degrees ($b = .12$, $p < .05$) are positive predictors of higher educational levels.

We also include a sixth model in Table 4 that incorporates the further mediating influence of high school GPA on the level of higher education achieved ($b = 1.21$, $p < .001$). Controlling for GPA also reduces by more than half and below statistical significance the individual-level effect of father's imprisonment ($b = -.39$, $p < .05$ to $b = -.16$, $p > .05$). High school GPA is

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Table 3. Respondent's Transcript Measured Cumulative Grade Point Average (GPA) at the End of High School Regressed on School Contextual and Individual-level Predictors

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	2.64***	2.68***	2.69***	2.52***	2.48***
	(.05)	(.04)	(.04)	(.08)	(.08)
School characteristics					
Biological father's imprisonment (ages 0-12) (standardized)		–.18***	–.10*	–.08*	–.07*
		(.05)	(.04)	(.04)	(.04)
Proportion of fathers with college degree (standardized)			.12*	.06	.04
			(.05)	(.05)	(.05)
School concentrated disadvantage (standardized)			–.15*	–.05	.05
			(.07)	(.06)	(.06)
Neighborhood drug problems (standardized)					–.04
					(.05)
Total crime rate (per 100,000 population) (std)[a]					–.05
					(.03)
Mean school-level delinquency (standardized)					–.04
					(.04)
Average school attendance level (standardized)					.10*
					(.04)
School size (standardized)					.01
					(.05)
Urbanicity of school[b] (standardized)					–.01
					(.04)
Public school[c] (standardized)					–.05
					(.03)
Number of full-time classroom teachers (standardized)					–.002
					(.04)
Percentage of teachers with a master's degree (standardized)					.03
					(.03)
Adolescent characteristics					
Biological father's imprisonment (ages 0-12)				–.18*	–.18*
				(.09)	(.09)
Biological father has college education				.34***	.33***
				(.04)	(.04)

(continued)

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Table 3. (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5
Biological father's alcoholism				–.14	–.14
				(.09)	(.09)
Perceived closeness with biological father				.03*	.03*
				(.01)	(.01)
Biological father smokes				–.16***	–.16***
				(.03)	(.03)
Delinquency (wave 1)				–.03***	–.03***
				(.00)	(.00)
Gender[b]				.30***	.30***
				(.03)	(.03)
Single parent family structure				–.10*	–.10*
				(.05)	(.05)
Hispanic[c]				–.14	–.11
				(.08)	(.08)
African American				–.19***	–.19***
				(.05)	(.05)
Asian American				.14	.16*
				(.08)	(.08)
Other				–.06	–.04
				(.09)	(.09)
Age				–.02*	–.02
				(.01)	(.01)
Household income (wave 1)				.002***	.002***
				(.00)	(.00)
Ever lived with father				.07	.07
				(.08)	(.08)
Variance components					
Level 2 between school	.11***	.09***	.07***	.05***	.04***
Level 1 between individual	.56	.56	.56	.46	.46
Deviance	10,984.63	10,962.93	10,940.78	10,071.97	10,079.52

Note: Reference categories are as follows:
a. Standardized variable.
b. Female = 1; Male = 0.
c. Non-Hispanic white.
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed).

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Table 4. Respondent's Highest Level of Education (Wave 4) Regressed on School Contextual and Individual-level Predictors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	5.61***	5.76***	5.81***	4.84***	4.92***	5.15***
	(.14)	(.07)	(.05)	(.29)	(.28)	(.30)
School characteristics						
Biological father's imprisonment (ages 0-12) (standardized)		−.65***	−.35***	−.30***	−.27***	−.20*
		(.08)	(.07)	(.08)	(.08)	(.07)
Proportion of fathers with college degree (standardized)			.55***	.28**	.19*	.14
			(.08)	(.09)	(.08)	(.09)
School concentrated disadvantage (standardized)			−.08	−.02	.03	−.04
			(.08)	(.09)	(.11)	(.09)
Neighborhood drug problems (standardized)					−.04	−.01
					(.10)	(.08)
Total crime rate (per 100,000 population) (std)					−.004	.05
					(.06)	(.06)
Mean school-level delinquency (standardized)					.09	.14*
					(.07)	(.06)
Average school attendance level (standardized)					.15	.03
					(.09)	(.06)
School size (standardized)					−.02	−.03
					(.08)	(.08)
Urbanicity of school[a] (standardized)					.004	.02
					(.07)	(.05)
Public school[b] (standardized)					−.06	−.01
					(.04)	(.05)
Number of full-time classroom teachers (standardized)					.18*	.17*
					(.07)	(.07)
Percentage of teachers with a master's degree (standardized)					.12*	.08*
					(.04)	(.04)
Adolescent characteristics						
Biological father's imprisonment (ages 0-12)				−.39**	−.38*	−.16
				(.15)	(.15)	(.14)
Biological father has college education				.96***	.96***	.56***
				(.11)	(.11)	(.08)
Biological father's alcoholism				−.27	−.26	−.08

(continued)

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Table 4. (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
				(.14)	(.14)	(.11)
Perceived closeness with biological father				−.02	−.02	−.05
				(.06)	(.06)	(.05)
Biological father smokes				−.15	−.15	.05
				(.12)	(.12)	(.12)
Delinquency (wave 1)				−.04***	−.04***	−.01
				(.01)	(.01)	(.01)
Gender[a]				.56***	.56***	.19
				(.17)	(.17)	(.18)
Single parent family structure				.16	.15	.27*
				(.11)	(.11)	(.11)
Hispanic[b]				.02	−.01	.12
				(.15)	(.15)	(.12)
African American				.15	.16	.43***
				(.13)	(.13)	(.12)
Asian American				.51*	.46	.26
				(.26)	(.27)	(.24)
Other				−.12	−.11	−.06
				(.22)	(.22)	(.17)
Age				−.01	−.02	−.001
				(.03)	(.03)	(.02)
Household income (wave 1)				.01***	.01***	.004***
				(.00)	(.00)	(.001)
Ever lived with father				.52	.51	.43
				(.28)	(.28)	(.27)
Cumulative grade point average						1.21***
						(.08)
Variance components						
Level 2 between school	.61***	.29***	.15***	.12***	.10***	.06***
Level 1 between individual	3.53	3.54	3.54	3.12	3.12	2.44
Deviance	19,711.40	19,647.43	19,594.39	19,043.97	19,054.68	17,880.86

Note: Reference categories are as follows:
a. Female = 1; male = 0.
b. Non-Hispanic white.
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed).

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a predictably powerful and long-term mediator of the level of education achieved in adulthood, reducing the effect of the school-level proportion of fathers with college degrees by about a quarter and below statistical significance (from $b = .19$, $p < .05$ to $b = .14$, $p > .05$). Nonetheless, the school-level effect of father incarceration remains robust and significant: High school GPA reduces the macro-influence of biological father's incarceration by about one third (from $b = -.27$ to $b = -.20$, $p < .01$). It is striking that the school-level effect of father incarceration on average level of education completed remains highly significant in the face of controls for a wide range of independent variables and high school GPA. Controlling GPA actually increases the effects of being African American ($b = .43$, $p < .001$) and the child of a single parent ($b = .27$, $p < .05$), while reducing the effect of father's college education by almost half (from $b = .96$ to .56).

The robust influence of the school level measure of father incarceration is also apparent in the hierarchical generalized linear models (HGLM) of earning a college degree summarized in Table 5. Again with college degree as the outcome in models 4 through 6, father incarceration is persistently significant—at the individual ($b = -.79$ to $-.85$, $p < .05$) and school levels ($b = -.39$ to $-.38$, $p < .001$)—than all other variables except father's college education ($b = 1.27$ to 1.06, $p < .001$) and respondent's GPA ($b = 2.23$, $p < .001$). The further results in the five models summarized in Table 5 are similar to findings in the previous tables.

The individual- and school-level influences of father incarceration are among the most reliably and persistently apparent findings across the educational outcome measures—GPA, highest education level completed, and college degree—across the three tables. The mediating role of GPA is also apparent in the latter two tables, although as perhaps should be expected, high school GPA is less important mediator of college graduation than in the previous table, which includes the fuller range of postsecondary outcomes. The influence of other variables is largely as expected. The most striking finding is the repeated impact of father imprisonment, both at the individual level and beyond at the school level of influence. There is consistent evidence that father incarceration not only operates in a long-lasting way, but also in a diffused way in high incarceration schools beyond the immediate family on other surrounding children as well.

Table 6 provides a sensitivity check for all three educational outcomes of possible collinearity effects of including several moderately to more highly correlated measures in the concentrated school disadvantage scale and among the other school-level variables in Tables 3 through 5. This table also reports tests for cross-level interaction effects of the school-level measures of biological father's incarceration with the race/ethnicity of the respondents. At the school level, we have included only the proportion of biological fathers incarcerated and the proportions of Hispanic and African American students in the schools, while at the student level we have included the race/ethnicity of the respondents and all the other student-level variables (although the latter coefficients are not presented to conserve space). In the top part of Table 6, we see that at the school level, the effects of father's incarceration on the respondent educational outcomes are almost identical to those presented for this variable in Models 1 and 5 of Tables 3 through 5, indicating these results are insensitive to possible collinearity problems at the school level. In the lower part of Table 6, we see that none of the cross-level interactions with race/ethnicity are statistically significant. The latter null findings indicate that while African American youth are more broadly impacted by having fathers imprisoned—because at both the student and school levels more of their fathers are imprisoned—the impact of race and paternal incarceration is additive rather than multiplicative.

We provide a further indication of the impact of parental incarceration on educational outcomes by, respectively, using the final main effects models in Tables 3, 4, and 5 to predict GPA, highest level of education attained, and college completion. We predict these outcomes under conditions that vary by whether a parent is incarcerated before age 12 and alternatively attending a high school with averaged upper or lower quartile levels of parental incarceration. The predictions are comparable in that the same remaining independent variables are included across the models and set at their mean values. Thus, for comparability, the prediction models used from Tables 4 and 5 exclude the mediating role of GPA for the highest educational level attained and college completion.

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Table 5. Hierarchical Generalized Linear Models (HGLM) of Respondent Completed College Degree (Wave 4) Regressed on School Contextual and Individual-level Predictors (Population Average Model)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	–.82***	–.74***	–.71***	–1.83***	–1.74***	–2.30***
	(.14)	(.07)	(.06)	(.40)	(.39)	(.57)
School characteristics						
Biological father's imprisonment (ages 0-12) (standardized)		–.72***	–.41***	–.39***	–.35***	–.38***
		(.08)	(.07)	(.08)	(.07)	(.08)
Proportion of fathers with college degree (standardized)			.59***	.28**	.29**	.23
			(.09)	(.10)	(.09)	(.12)
School concentrated disadvantage (standardized)			–.02	.04	.10	–.01
			(.12)	(.13)	(.15)	(.16)
Neighborhood drug problems (standardized)					.01	.02
					(.11)	(.12)
Total crime rate (per 100,000 population) (std)[a]					–.12	–.05
					(.07)	(.08)
Mean school-level delinquency (standardized)					.11	.29**
					(.07)	(.09)
Average school attendance level (standardized)					.11	–.06
					(.08)	(.08)
School size (standardized)					.10	.12
					(.09)	(.10)
Urbanicity of school[b] (standardized)					–.03	.01
					(.07)	(.07)
Public school[c] (standardized)					–.05	–.01
					(.05)	(.07)
Number of full-time classroom teachers (standardized)					.13	.12
					(.10)	(.10)
Percentage of teachers with a master's degree (standardized)					.14*	.13*
					(.06)	(.06)
Adolescent characteristics						
Biological father's imprisonment (ages 0-12)				–.79*	–.79*	–.85*
				(.40)	(.39)	(.36)
Biological father has college education				1.27***	1.29***	1.06***
				(.20)	(.20)	(.21)

(continued)

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Table 5. (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Biological father's alcoholism				–.32	–.32	−.12
				(.22)	(.22)	(.23)
Perceived closeness with biological father				–.06	–.05	−.13
				(.09)	(.09)	(.10)
Biological father smokes				–.17	–.17	.08
				(.15)	(.15)	(.16)
Delinquency (wave 1)				–.07***	–.07***	−.03
				(.01)	(.01)	(.02)
Gender[b]				.36***	.36***	−.17
				(.09)	(.09)	(.12)
Single parent family structure				.28	.26	.52*
				(.18)	(.17)	(.22)
Hispanic[c]				.15	.11	.52
				(.29)	(.32)	(.43)
African American				.29	.30	1.05**
				(.24)	(.23)	(.33)
Asian American				.56*	.48	.28
				(.28)	(.29)	(.35)
Other				.34	.34	.45
				(.31)	(.32)	(.31)
Age				–.05	−.07*	–.05
				(.04)	(.03)	(.04)
Household income (wave 1)				.01***	.01***	.01**
				(.00)	(.00)	(.00)
Ever lived with father				.58	.57	.83
				(.40)	(.40)	(.57)
Cumulative grade point average						2.23***
						(.13)
Variance components						
Level 2 between school	.66***	.28***	.11***	.14***	.09***	.10***

Note: Reference categories:
a. Standardized variable.
b. Female = 1; male = 0.
c. Non-Hispanic white.
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed).

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Table 6. Hierarchical Linear Model (HLM) and Hierarchical Generalized Linear Model (HGLM) Models of Educational Outcomes Regressed on Student- and School-level Predictors and Cross-level Interactions with Race

	Respondent grade point average[a]		Respondent highest level of education (wave 4)[a]		Respondent completed college degree (wave 4)[b]	
	1	2[c]	3	4[c]	5	6[c]
Intercept	2.64***	2.49***	5.76***	4.89***	−.74***	−1.83***
	(.04)	(.08)	(.08)	(.28)	(.08)	(.36)
School characteristics						
Biological father's imprisonment (ages 0-12) (std)[d]	−.19***	−.08*	−.65***	−.28***	−.71***	−.34***
	(.03)	(.03)	(.08)	(.07)	(.07)	(.07)
Proportion of Hispanic students (std)[d]	−.07*	.05	.02	.04	−.01	−.07
	(.03)	(.04)	(.09)	(.09)	(.08)	(.09)
Proportion of African American students (std)[d]	−.14*	−.06	−.03	−.13	.07	−.19
	(.06)	(.04)	(.09)	(.10)	(.12)	(.12)
Student characteristics						
African American		−.14*		.23		.33
		(.06)		(.14)		(.27)
Hispanic		−.15*		−.05		.04
		(.08)		(.16)		(.28)
Cross-level interactions						
Biological Father's Imprisonment × African American		−.03		.05		.47
		(.06)		(.13)		(.25)
Biological Father's Imprisonment × Hispanic		.01		.27		.54
		(.10)		(.24)		(.31)

a. HLM model.
b. HGLM model.
c. All other covariates included model except index of school disadvantage and student grade point average.
d. Standardized variable.

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Although the bar graphed patterns are similar across the three outcomes, the disparities in outcomes are perhaps most apparent in Figure 1C for college completion. School incarceration effects are apparent for both sets of bars in Figure 1C. More than 40 percent of the youth without a biological father incarcerated before age 12 who attend a school with only 2.5 percent parental incarceration complete college. Yet just over 25 percent of the youth without a biological father incarcerated before age 12 who attend a school with 13.4 percent parental incarceration complete college. This is about the same level of college completion for youth who attend a school with only 2.5 percent parental incarceration but who have a biological father incarcerated before they are 12. Finally, only about 12.5 percent of the youth with a biological father incarcerated before age 12 and attending a school with 13.4 percent parental incarceration complete college. Thus, the combined result of having an incarcerated father and attending a school with a relatively high rate of paternal incarceration is to reduce college completion by about three quarters, from 40 percent to 10 percent.

COLLATERAL DAMAGE OF PATERNAL MASS INCARCERATION

The mass incarceration of American parents has grown to the point that more than a fifth of the fathers at highly affected schools have already spent time in jail or prison by the end of their child's primary school education. Our results indicate that concentrated incarceration of parents in school populations is negatively and significantly associated with the educational attainment of children. Most notably, we demonstrate that students at schools with higher levels of paternal incarceration have limited access to the levels of academic accomplishment increasingly required to succeed in America. These findings expand the perspective that childhood and adolescent school experiences are defining mediating moments in the life course (Arum and Beattie 1999). The net negative school-level association we have observed of paternal imprisonment with educational attainment persists even after we introduce both school- and individual-level mediating processes and extraneous or selective predispositions into our analyses. Parental incarceration is an increasingly impermeable barrier between college- and non–college-bound youth in America.

These results are supportive of prior theoretical and empirical work indicating a link between parental incarceration and children's educational outcomes (Cho 2010; Foster and Hagan 2007, 2009; Friedman and Esselstyn 1965; Stanton 1980; Trice and Brewster 2004). However, this analysis differs in establishing that the net association of negative educational outcomes with the school-level concentration of paternal incarceration in the aggregate, or in other words, the mass incarceration of fathers "spills over" to youth beyond the children of incarcerated fathers. This study provides evidence of an interinstitutional prison through school pathway of intergenerational influence of fathers on children in America.

We have considered three perspectives on effects of paternal incarceration on the educational attainments of children that focus on the residential mobility and stigmatic stereotyping involved in the interruption of parent–child relationships, the availability of educational and economic resources, and the selection of parents and children into imprisonment as well as neighborhood school settings where imprisonment is common. Our findings are to varying degrees consistent with all three of these perspectives and we must await further research to better distinguish the alternative mechanisms implied by them. We have placed our emphasis on the net negative association—beyond measured resource and potential selection differences—observed at both the student and school levels between paternal incarceration and educational outcomes. We have suggested that paternal incarceration results not only in removal from the community, but is furthermore a form of "marked absence" that predicts consistently negative outcomes at student and school levels across the three educational measures we have considered.

Pager (2007, p. 4) describes the marking process of imprisonment as creating a form of negative credential: "The 'credential' of a criminal record, like educational or professional credentials, constitutes a formal and enduring classification of social status, which can be used to regulate access and opportunity across numerous social, economic, and political domains." Wakefield and Uggen (2010) similarly suggest

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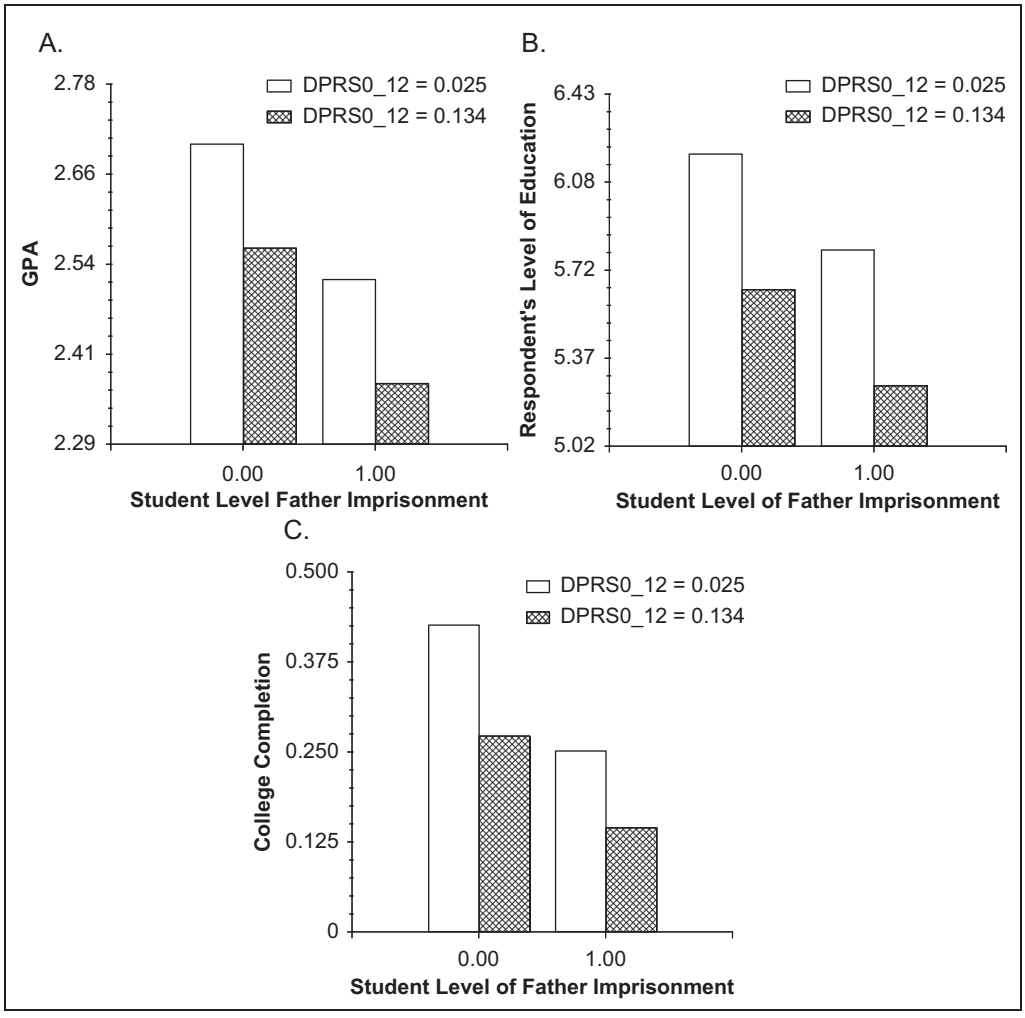

Figure 1. Cumulative grade point average (GPA), respondent's education level, and college completion as a function of father's imprisonment

Note: DPRSO_12 corresponds to averaged lower and upper quartiles on school-level proportion of father imprisonment.

that current and former prisoners have emerged as a distinct Weberian status group, with the prison now assuming a place as a major stratifying institution in American society that is altering life chances in myriad ways that go to the heart of stratification research. Comfort (2008) calls the children of incarcerated parents "legal bystanders" who are drawn within the perimeter of the effects of the legal system through the actions of others. It is important that we further understand the interconnections of imprisoned parents, "fragile families," and underresourced schools in the educational process (Western, Lopoo, and McLanahan 2004). This understanding requires attention to the changing American context in which these connections are unfolding.

It is important to acknowledge that some of the most severely marked youth (cf. Hagan and McCarthy 1998) may not be represented in the school sample used in this research, even though the Add Health survey is designed to be nationally representative. The youth in the Add Health panel study we have analyzed were born and raised before, during, and after the surge in drug-related

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violence that devastated America's racial ghettoes. The first two waves of the Add Health study were conducted in 1995 and 1996 when these youth were in their teens and crime rates in America were receding. Yet imprisonment was continuing its steep ascent. Mauer's (2009) recent research reveals that this was a period of massively concentrated and race-laden but also ultimately declining imprisonment of blacks for drug crimes, combined with still increasing imprisonment for whites (see also Oliver 2008). Mass imprisonment policies in America began in the 1990s to equalize the racial risk of imprisonment—but at the collateral cost of raising imprisonment in the aggregate. This may have contributed to a generic impact our analysis suggests of the mass imprisonment of fathers on African American and other youth. Nonetheless, it remains the case that during the longer period covered by the Add Health panel, African American fathers were much more likely than other fathers to be incarcerated, so the African American youth in the sample were more broadly impacted than other youth by paternal incarceration (i.e., in simple additive if not multiplicative terms) (see also Wakefield and Wildeman 2011).

D. Gottfredson (2001) makes the potentially important point that the size of the kind of school effects we have observed are likely underestimated to the extent that relevant variation exists within school micro-environments. She observes that, "Schools contain important micro-environments, the most important of which is probably the classroom. If the classroom effects offset one another, estimates of school effects will be relatively meaningless averages of these more potent effects" (p. 81). While these effects are unlikely to be completely offsetting, it is potentially important to think about the extent to which streams of classes within schools, and smaller groupings of peers within these streams, bring imprisonment effects into schools and surrounding settings. It is likely in selected tracks and streams of inner-city high schools in America that the fathers of more than half of the youth have been incarcerated.

We suggest that future research should focus on the role of classroom teachers in what Pager has called the marked and negative credentialing process. There is potentially important experimental evidence that what we have called the marked absence of an incarcerated parent can impair teacher–student relationships in schools. Dallaire et al. (2010) randomly assigned scenarios to teachers describing a female student whose mother was imprisoned. They found that the teachers in their experimental treatment group rated these students as less competent than teachers in a control group in which the child's mother was described as being away for other reasons. Further research could usefully test whether this effect is limited to incarcerated mothers and daughters and whether this effect is additionally influenced by variation in surrounding school incarceration levels.

The broad-ranging intergenerational school effects of mass incarceration observed in this research indicate that the "long arm of the law" reaches far beyond the jails and prisons where inmates are held, with harmful collateral consequences for educational outcomes that extend more broadly across the geographic and temporal landscape of the national American sample we have examined.

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APPENDIX

Variable	Description
Educational outcome variables	
High school cumulative grade point average (GPA)	The Adolescent Health and Academic Achievement component of the Add Health study collected high school transcript information on respondents at wave 3 (91.5 percent). Transcript coded overall cumulative GPA represents the average GPA across all years for which the student was taking courses. The overall cumulative GPA captures student academic performance in key curricular subjects (math, science, foreign language, English, history/social science, and PE) as well as across all subjects including noncore and nonacademic courses (Muller et al. 2007; Riegle-Crumb et al. 2005).
Education level (wave 4)	Respondents were asked at wave 4: "What is the highest level of education that you have achieved to date?" 1 = *eighth grade or less*; 2 = *some high school*; 3 = *high school graduate*; 4 = *some vocational/technical training (after high school)*; 5 = *completed vocational/technical training (after high school)*; 6 = *some college*; 7 = *completed college (bachelor's degree)*; 8 = *some graduate school*; 9 = *completed a master's degree*; 10 = *some graduate training beyond a master's degree*; 11 = *completed a doctoral degree*; 12 = *some postbaccalaureate professional education (e.g., law school, medical school, nurse)*; 13 = *completed postbaccalaureate professional education (e.g., law school, medical school, nurse)*.
College degree obtained (wave 4)	Respondent's education level at wave 4 was partitioned into those with college completion (7) and higher compared to the reference category (levels 1-6).
School characteristics	
Biological father's imprisonment (ages 0-12)	A mean indicator was formed at the school level at wave 1 to measure the proportion of students with a biological father imprisoned during adolescent ages 0 to 12. This information was determined from responses to wave 4 items indicating an adolescent's father had been incarcerated between the adolescent ages 0 to 12. This variable was then standardized.
School concentrated disadvantage	Five items were used to form a school index of concentrated disadvantage. Using census data at the block group level, an indicator was used of (1) the proportion of households with income of less than $15,000 and (2) proportion of persons with income in 1989 below poverty level; (3) a school-level mean variable was formed from the adolescent's family household income at wave 1 as reported by the parent where the lower quartile was used to indicate low income families; (4) a school-level mean variable was formed indicating the proportion of single parent families from information on whether the adolescent lived in a single parent family at wave 1 or not; (5) from the in-school survey a question regarding adolescent race was used to indicate if the respondent was black or African American, which was aggregated to proportion black or African American at the school level. Each of these variables was standardized and a mean score of school concentrated disadvantage was formed. Factor loadings on this index ranged from .60 to .90.

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APPENDIX (continued)

Neighborhood drug problems	In the parent questionnaire, the parental figure was asked: "In this neighborhood, how big of a problem are drug dealers and drug users?" *no problem at all* (1), *a small problem* (2), *a big problem* (3). The mean level of this measure was used to indicate school-level neighborhood drug problems. This variable was then standardized.
Total crime rate	Wave 1 contextual data were used to form a school-level indicator of the average county-level total crime rate per 100,000 population in the reporting area for each adolescent. This variable was then standardized.
School-level delinquency	Respondent indicated delinquency scores at wave 1 were aggregated to form the mean levels school delinquency. This variable was then standardized.
Proportion of fathers with college degree	In the in-school survey, respondents were asked regarding their biological father, stepfather, foster father, or adoptive father: "How far in school did he go?" Responses of graduated from a college or university and professional training beyond a four-year college were used to indicate college completion. The reference category includes those fathers with eighth-grade education or less; more than eighth grade but did not graduate from high school; high school, completed a GED; went to a business, trade, or vocational school after high school; those whose fathers went to school, but the respondent was unsure of the level; those whose fathers never went to school; and those who did not know if he went to school.
Average daily school attendance level	A school administrator was asked at wave 1: "What is the approximate average daily attendance level in your school?" The response scale was reverse coded to the following values: 75 to 79 percent (1), 80 to 84 percent (2), 85 to 89 percent (3), 90 to 94 percent (4), 95 percent or more (5). This variable was then standardized.
Size of school	The size of the school was coded on the school administrator's questionnaire as: small (1-400 students) (1), medium (401-1,000 students) (2), large (1,001-4,000 students) (3). This variable was then standardized.
Urbanicity of school	The location of the school was indicated on the school administrator's questionnaire as: urban (1) with suburban or rural constituting the reference category (0). This variable was then standardized.
Type of school (1 = public)	The type of school was indicated on the school administrator's questionnaire and was coded to a dummy variable as: public (1) or private (0). This variable was then standardized.
Number of full-time teachers	A school administrator was asked at wave 1: "How many people work as full-time classroom teachers in your school (excluding teacher's aides)?" The number of full-time teachers in schools ranged from 5 to 182 with an average of 56. This variable was then standardized.
Percentage of teachers with master's degree	A school administrator was asked at wave 1: "Approximately what percentage of your full-time classroom teachers hold a master's degree or higher?" This variable was then standardized.
Proportion Hispanic	Respondents were asked in the in-school questionnaire "Are you of Hispanic and Spanish origin?" Responses were aggregated to form a school-level measure or the proportion Hispanic. This variable was then standardized.
Proportion African American	Respondents were asked in the in-school questionnaire "What is your race?" Responses were aggregated to form a school-level measure of the proportion black or African American. This variable was then standardized.

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APPENDIX (continued)

Adolescent characteristics	
Biological father's imprisonment (ages 0-12) (wave 4)	At wave 4 respondents were asked: "Has your biological father ever served time in jail or prison?" 1 = yes. A dummy variable was created using a positive response to aforementioned question and occurrence of imprisonment between 0 and 12 years of age in response to the question "How old were you when your biological father went to jail or prison (the first time)?" Responses range from <1 year (0) to 31 years. The reference category includes all respondents whose biological father has not gone to prison, those with a father imprisoned after age 12, those with fathers imprisoned before they were born, those where date information was refused, or the respondent did not know the timing of his imprisonment.
Biological father's college completion (wave 1)	This variable combines information from adolescent reports at wave 1 on biological fathers from the nonresident biological father section of the questionnaire and the resident father section. This measure uses responses to the question "How far in school did your biological father go?" where graduation from college or university to professional training beyond a four-year college or university was coded 1 and less than college education was coded 0. The same response scale was used for a question regarding the education level of the resident father, which was used if the person filling out the parent questionnaire was the child's biological father or it was indicated that the biological father lived in the household.
Biological father's alcoholism (wave 1)	A dummy variable was created where a positive response indicated the child's biological father had alcoholism as indicated in a question posed in the parent questionnaire at Wave 1.
Perceived closeness to biological father (wave 1)	This variable combines information from adolescent reports on biological fathers from the nonresident biological father section of the questionnaire and the resident father section. Youth with nonresident biological fathers were asked "How close do you feel to your biological father?" *not close at all* (1), *not very close* (2), *somewhat close* (3), *quite close* (4), *extremely close* (5). Information was also used on relations with the father figure if the parent interview indicated the person filling out the parent questionnaire was the child's biological father or that the biological father lived in the household using the item: "How close do you feel to your (father figure)?" *not at all* (1), *very little* (2), *somewhat* (3), *quite a bit* (4), *very much* (5). The two questions were combined to take a nonmissing response as the indicator of their closeness to their biological father.
Biological father smokes (wave 1)	This variable combines information from adolescent reports on biological fathers from the nonresident biological father section of the questionnaire as well as the resident father section. Adolescents responded to the question on nonresident fathers regarding: "Has your biological father ever smoked cigarettes?" 1 = yes. This measure also uses information on the resident father if the parent interview indicated the person filling out the parent questionnaire was the child's biological father or that the biological father lived in the household from the item: "Has he ever smoked?" 1 = yes. A positive response to either of these two questions indicated the biological father smoked.

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APPENDIX (continued)

Delinquency (wave 1)	A mean score was formed from responses to the following 15 items regarding the past 12 months before the interview (α = .86): 1. "How often did you paint graffiti or signs on someone else's property or in a public place?" *never* (0), *1 or 2 times* (2), *3 or 4 times* (3), *5 or more times* (3); 2. "Did you deliberately damage property that didn't belong to you?"; 3. "Did you lie to your parents or guardians about where you had been or whom you were with?"; 4. "Did you take anything from a store without paying for it?"; 5. "Did you run away from home?"; 6. "Did you drive a car without its owner's permission?"; 7. "Did you steal something worth more than $50.00?"; 8. "Did you go into a house or building to steal something?"; 9. "Did you sell marijuana or other drugs?"; 10. "Did you steal something less than $50.00?"; 11. "Were you loud, rowdy, or unruly in a public place?"; 12. "Did you get into a serious physical fight?"; 13. "Did you hurt someone badly enough to need bandages or care from a doctor or nurse?"; 14. "Did you use or threaten to use a weapon to get something from someone?"; 15. "Did you take part in a fight where a group of your friends was against another group?"
Gender	1 = female
Hispanic	Adolescent self-reported racial and ethnic identification data at wave 1 were used to construct the race/ethnicity dummy variables. Any incidence of Hispanic status was used to first categorize respondents, followed by other group designations. The reference group in analyses is the white non-Hispanic group.
Black Non-Hispanic	Same as Hispanic
Asian	Same as Hispanic
Native American	Same as Hispanic
Other	Same as Hispanic
Black Hispanic	Same as Hispanic
Age (wave 1)	Age in years
Family household income	Using parental interview responses to the question "About how much total income, before taxes did your family receive in 1994?" a family household income measure was derived (ranges from 0-999 thousand). Due to missing data, imputation analyses were conducted using information on parental welfare receipt, parental age, parental education, family structure, and race/ethnicity.
Adolescent family structure	Adolescent household roster information was used to create a measure of living in a single-parent household compared to all other family types.
Ever live with biological father	The parent was asked in the parent questionnaire: "Did [NAME] ever live with (his/her) biological father?" Those who responded yes or indicated the biological father lived in their household were coded 1.

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