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EMPIRICAL RESEARCH

Is Educational Achievement a Turning Point for Incarcerated Delinquents Across Race and Sex?

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Abstract Research has linked the role of education to delinquency, but much of the focus has been on general population samples and with little attention to demographic differences. Employing a cumulative disadvantage framework that integrates elements of informal social control and labeling theories, this article examines whether academic achievement serves as a positive turning point and re-directs juvenile delinquents away from subsequent offending. Attention is also given to race/sex contingencies. Using a sample of 4,147 delinquents released from Florida correctional institutions (86% male, 57% non-White, average age at release = 16.8 years), propensity score analysis yielded two findings: youth with above average academic achievement while incarcerated were significantly more likely to return to school post-release, and youth with above average attendance in public school were significantly less likely to be re-arrested in the 1-year post-release period. While the academic gains were pronounced among African-American males, the preventive effects of school attendance are similar across race and sex, suggesting that education can be a part of a larger prevention effort that assists juvenile delinquents in successful community re-entry.

Keywords Labeling · Education · Recidivism · Race · Sex

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Introduction

Just as the importance of school readiness for later (educational) achievement is well-established (Duncan et al. 2007), it is also true that academic failure is one of many problematic aspects of adolescence (Steinberg and Morris 2001). Many adolescents who have recurrent problems with the criminal justice system have had problems at school and many of these concerns emerge as early as preschool (Gottfredson 2001; Moffitt 1993). Not surprisingly, a series of prior studies have addressed the role of education in reducing delinquency among the general population.

These studies have consistently reported less involvement in delinquency among youth who were committed and attached to school, spent significant time studying, and made good grades (Cernkovich and Giordano 1992; Massey and Krohn 1986; Stewart 2003). Studies of educational achievement and recidivism for incarcerated delinquents have generally been limited to addressing the question of whether participation in education programs that results in high school graduation or the earning of a GED reduces recidivism with little attention given to the potential differences across race and sex (Ambrose and Lester 1988; Brier 1994). Further, few youths graduate from high school or earn a GED while incarcerated (Foley 2001; Leblanc and Pfannenstiel 1991). As a result, more general and applicable measures beyond high school graduation or earning the GED during incarceration are needed to adequately assess the role of educational achievement in reducing recidivism for incarcerated delinquents across race and sex. Moreover, and very importantly, prior studies have ignored the potential relationship between academic achievement during incarceration and returning to school post-release as potentially indirect and direct effects in reducing recidivism.

This article examines how educational achievement indirectly and educational attendance directly relates to recidivism across race/sex in a large sample of juvenile delinquents released from Florida juvenile justice institutions and followed for 1-year post-release. Our theoretical orientation relies on Sampson and Laub's (1997) theory of cumulative disadvantage that integrates social control and labeling theories. Specifically, we explore how the life event of educational achievement may re-direct life paths away from crime and set the stage for a more conventional set of structured opportunities that promote and support a desistance-from-crime process. This central question is examined with a specific focus on race/sex contingencies. Next, we present a brief overview of Sampson and Laub's integration of labeling into their age-graded, informal social control framework (Sampson and Laub 1993), cumulative disadvantage, and of the importance of assessing race/sex contingencies.

Cumulative Disadvantage Theory

Sampson and Laub (1997) have revitalized classic conceptions of labeling theory into a developmental theory of structural disadvantage. These scholars adhere to the traditional labeling view that official intervention increases future offending but also focus upon the triggering effects that labels may have as they serve to exclude individuals from conventional opportunities in education, employment, and social relationships. Serious sanctions in particular are seen as leading to a "knifing off" (Moffitt 1993) of future opportunities in that labeled offenders have fewer options for a conventional life. Thus, with weak social bonding serving as a mediating link in a chain of adversity between childhood delinquency and adult criminal behavior, their perspective combines both social control and labeling within a broader life-course framework.

For Sampson and Laub (1997:134): "Development is thus focused on systematic change, especially how behaviors set in motion dynamic processes that alter future outcomes." A major assumption of their theory is that social bonds in adolescence (to family, peers, and school) and adulthood (to labor force, cohesive marriage) explain crime regardless of prior differences in criminal propensity (or that age-graded changes in social bonds explain changes in crime) (p. 142). Thus, turning points or changes in the life course may alter criminal activity up/down, i.e., they can "redirect paths" (p. 143), and these may be both dramatic and instantaneous or gradual and occur over time. Accordingly, turning points can be "positive *or* negative because they represent 'times of decision or opportunity when life trajectories may be directed on to more adaptive or maladaptive paths' (Rutter and Rutter 1993: 244)" (p. 143, emphasis in original).

Contingencies

Sampson and Laub (1997: 152–153) further suggest that the concepts of "knifing off" and cumulative continuity are most salient in explaining the structurally constrained life chances of the disadvantaged urban poor whereas those in more advantaged positions have access to more resources that can help them overcome potentially life-changing events and help them counteract and/or overcome stigmatizing negative labels. Thus, the process of cumulative disadvantage—especially among poor urban minorities—restricts future options in conventional life that provide opportunities for social "interdependence" (e.g., stable employment) while simultaneously encouraging options within subcultures that "reject the rejectors". For Sampson and Laub (1997: 154–155), "the 'piling up' of disadvantage…is likely to interact with race and structural location…Namely…that the probability of adolescent risks becoming transmuted into adverse adult circumstances is greatest among those in disadvantaged racial and economic positions" suggesting potential differences in how labels relate to criminal activity across both race and sex.

There have been only a few investigations of the cumulative disadvantage thesis. Bernburg and Krohn (2003) provided a test using panel data on Rochester males from early adolescence through early adulthood finding that official intervention in adolescence had a positive effect on crime in early adulthood that was partially mediated by educational achievement and employment but did not vary by structural location (race or poverty). In a subsequent study, Bernburg et al. (2006) examined whether deviant social group involvement mediated the relationship between juvenile justice intervention and subsequent delinquency and found that it did so primarily through street gangs and delinquent peers. A third study by De Li (1999) used data from over four hundred South London males and found that convictions between ages 10–13 directly and indirectly affected achievement at ages 18/19, but that convictions at ages 14–16 were not relevant predictors indicating that early arrests may be more detrimental than later arrests, implying that the timing (or age at occurrence) of life events may be an important feature of whether life events relate to persistence/desistance from crime. Using data from the National Longitudinal Survey of Youth 1997, Sweeten (2006) found that first-time court appearance during high school increased the likelihood of dropping out of high school independent of involvement in delinquency. Further, he found that the effect of court involvement was more pronounced among the least delinquent individuals, but that the effect of official intervention did not vary by structural location to include urban residence, parental income, or minority status (p. 475). Although these studies have provided findings relevant to

the hypothesis that the effects of official labels vary by structural position, the findings are inconsistent and limited. Among these are minimal attention to selection bias, the lack of investigation of labeling across demographic subgroups, and assessments among offender samples. Most importantly, while studies have examined the effect of official justice sanctions on some measure of educational achievement, few have considered the effect of educational achievement on subsequent offending among demographically differentiated offenders using methods that address selection bias issues.

Sex, Race, and Labeling

As studies have shown that societal reaction to individual behavior has not been uniform across demographic groups, several investigations have explored the inter-relationships among sex, labeling, and crime. Ray and Downs (1986) conducted a longitudinal study of labeling and found support for the secondary deviance-increasing hypothesis among males, but for females drug use was found to be causally connected prior to labels, thereby contradicting secondary deviance. They also observed that females reacted to their drug use with changes in their self-label, indicating that over time females do "relabel themselves in response to deviant behavior" (p. 192). Heimer (1995) considered the social-psychological processes by which gender and racial inequality translate into delinquency/crime. Building on an interactionist perspective, she argues that both racial and gender inequality restricts certain positions and networks and thus definitions of the situation (and self) and delinquency (p. 154). Her initial set of results for these hypotheses revealed that concern with negotiating positive self-image is important for understanding gender differences in delinquency because males and females manage their self-esteem in different ways.[1] Heimer (1996:56) further specified that gender definitions are "acquired and incorporated into the self through role-taking and then serve to regulate behavior" and while she uncovered similarities in the delinquency-generating process across gender, she also found gender differences in the role-taking process as internalizing gender definitions reduced girls' but not boys' delinquency, whereas parental supervision controlled boys' but not girls' delinquency. Thus, studies suggest that males and females react differently to societal reactions to their behavior.

Other studies have looked at the effect of race within a labeling perspective. Bertrand and Mullainathan (2004) responded to 1,300 classified ads with fake resumes and found that Black-sounding names were 50% less likely to get a callback than White-sounding names with comparable resumes. Charles et al. (2006) examined claims of differential treatment of minorities in the vehicle-lending market with data from the Survey of Consumer Finances and found that Blacks paid higher interest rates on new car loans originating at vehicle finance companies, conditional on borrower credit characteristics, but less so for loans originating at banks or credit unions. Boehm et al. (2006) used mortgage data originating between 1989 and 2001 from the American Housing Survey to examine race/ethnic differences in mortgage rates and found differences in the conventional mortgage market, with Blacks paying a much higher annual percentage rate than Whites for both purchases and refinancing (p. 109). Rosenfield et al. (2006) studied the inter-relationships between sex, race, and the self for understanding internalizing and externalizing problems. Results showed that sex and race interacted to shape schemas about self-salience (how adolescents perceive what others think of them and how adolescents describe themselves), and that these differences helped explain the disparities by sex and race in internalizing and externalizing problems. Specifically, White girls were lowest in self-salience and tended to have lower evaluations of the self, which translated into their having the greatest internalizing problems. Black girls had relatively low rates of both internalizing and externalizing problems, and tended to show self-salience messages and schemes that were similar to those of boys. Thus, there seems to be differential societal reaction to individual characteristics and behavior across race.

Criminologists have also investigated the relationship between race, labeling, and crime (e.g., Thornberry 1972). In an important study, Bridges et al. (1987) examined court personnel perceptions associated with minority over-representation in prison in several Washington counties and found that several court personnel described the county crime problem as a "minority problem" and described minority offenders as more dangerous than Whites (pp. 355–356; see also Albonetti 1997). Such perceptions could, in turn, influence actual decisions and policies that then produce over-representation among Blacks. In a follow-up study, Bridges and Steen (1998) examined probation officers' files associated with juvenile offenders and their crimes and found differences in how the officers attributed the causes of crime for White and minority juveniles. More specifically, they were more likely to attribute Black

[1] Her perspective also argues that violent crime among Black males is due to their attempt to negotiate masculine identities in the face of structural constrains that make claiming valued identities difficult. On the other hand, "females who bring to interactions traditional beliefs about gender are likely to define situations such that delinquency seems undesirable, because they will be likely to view law violation as inappropriate for their gender. Females who are less accepting of traditional gender ideologies, in contrast, define situations such that delinquency is a more likely outcome" (Heimer 1995: 150).

juvenile offending to negative attitudinal and personality traits while White attributions were centered around social circumstances. These views also influenced officers' sentencing recommendations. Thus, the criminal justice system seems to be interpreting the behavior of Blacks and Whites differently, which in turn, may have consequences for decisions as individuals further penetrate the system.

Educational Attainment as a Positive Label and Variation Across Race and Sex

Data indicate clear differences in educational attainment across race/ethnicity, with Whites having the most (graduation) success at all grade levels. These differences tend to start early, especially given the wide variation in school context, tracking resources and programs, and the perceived barriers among certain groups (non-Whites) about their ability to succeed in education. All of these considerations also relate to keeping minority students in school, as research shows that those who stay in school tend to earn more than those who do not because they attain the requisite graduation needed for gainful employment (Finn 2006; Hurtado 1989). Also adding to this education gap is the finding that White (male) students are more likely than Black (male) students to be placed in gifted/talented programs, yet the latter are more than twice as likely to be classified as "mentally retarded", "in spite of research demonstrating that the percentages of students from all groups are approximately the same at each intelligence level" (Schott Foundation for Public Education 2010:35; see also National Academy of Sciences 2002).

Similar differences emerge on these and related outcomes of educational attainment, participation in special programs, and remedial designation across sex. Although there has been much discussion with respect to the interrelationship between sex and math/science training and success, there are significant sex differences in educational attainment (Hoe 2007) and in performance on standardized test scores (Gillborn and Mirza 2000). The National Academy of Sciences (2002) reported that boys were overrepresented in programs for learning disabilities, mental retardation and emotional disturbance, and slightly underrepresented in gifted programs compared to girls.

Data from the National Center for Educational Statistics (2010) comparing trends from 1971 to 2009 highlighted several related findings. First, higher percentages of Whites had completed high school than Blacks or Hispanics in 1971 and in 2009, although the gaps have narrowed over the years—especially between Blacks and Whites (from 23 to 6 percentage points). With respect to sex, educational attainment gaps have shifted between 1971 and 2009. In 1971, a higher percentage of males completed high school than females, but in 2009, the rate was higher for females than males (by 2% points). The same was found for bachelor's degree attainment: in 1971, a higher percentage of males than females had a bachelor's degree, while by 2009 the percentage of females who had attained a bachelor's degree was higher than that of males (by 8% points). Thus, the race/sex differences observed for educational experience may translate into similar differences across race/sex for various behavioral outcomes and adaptations.

Theoretical Conceptualizations and Considerations

The differences in education and subsequent career attainment across race and sex must be considered within the context of several influences. Theoretical models based largely on the inequality literature provide helpful conceptualization of these differences. DiPrete and Eirich (2006) advance a cumulative advantage perspective, in which a favorable relative position becomes a resource that produces further relative gains. That is, future accumulation depends on current accumulation and this accumulation grows over time such that early inequalities between persons/groups also grow over time. Thus, one view holds that Blacks tend to suffer more from cumulative disadvantage than Whites because they start off behind and then encounter problems at various places that further limit progress, such as bad schools, bad teachers, labeling and tracking in schools. Being Black then, leads to cumulative disadvantage because race has both direct and indirect effects on outcomes at different stages of the life course because of the consequences of early life disadvantages (see Blau and Duncan 1967). The key point is that small (dis)advantages at early stages of the life course can grow larger (reverberate) over time. Thus, many poor (especially minority male) children arrive at school well behind their more fortunate peers academically, and chronic school-based inequities such as low teacher expectations and unexamined ability-grouping practices exacerbate these differences (Fritzberg 2001), which may, in turn, lead to the perception of barriers in the formulation and pursuit of educational (and career) goals (McWhirter 1997). In another conceptualization of cumulative advantage/cumulative disadvantage, O'Rand (1996: 230–231) advanced the notions of precious (to understand what is valued, protected, or rewarded) and precocious (to understand the cumulative advantage that ensues from sustained attainments). Benefits and cumulative advantages will accrue to those with early and sustained attainments within institutional contexts that assign value and extend protection and reward. In the context of our study, education careers reflecting early and long-term participation and attainment will constitute cumulative advantage.

A second theoretical model that is helpful for understanding the origin and existence of these differences is critical race theory. As applied to education/school inequity, Ladson-Billings and Tate (1995) outlined three propositions: (1) race is a significant factor in determining inequity in the US; (2) US society is based on property rights; and (3) the intersection of race and property creates an analytic tool through which social and school inequity can be understood. Tate (1997) further articulated the process by which critical race theory could be used to help illuminate and explain educational inequities across race. Specifically, he argued that because racism is endemic in the US, deeply ingrained legally, culturally, and even psychologically, there is a need to understand how traditional interests, cultural artifacts, and society more generally serve as vehicles to limit and bind the educational opportunities of students of color (p. 234). Thus, critical race theory may help describe why it is common for Black youth to come into the educational system already disadvantaged (i.e., they reside in impoverished neighborhoods, disproportionately come from broken/poor families, both of which are risk factors for crime and both of which also influence the location of and access to 'good schools'). Poor/minority children–already starting off in difficult circumstances—encounter poor schools and this roadblock stymies their readiness for mainstream success. School-based inequities, then, further compound the problem and their 'behind the curve' arrival simply segues into a 'behind-the-curve' exit out of school, leaving many poor/minority children ill-equipped with the skills necessary to compete for meaningful jobs in the twenty-first century (Smelser et al. 2001). When crime and incarceration are considered, problems are further compounded.

Current Study

Existing studies have investigated the extent to which life events relate to persistence/desistance from crime, but these efforts have been focused largely on selected adulthood life events and have not assessed potentially important adolescent life events and demographic differences in how these life events may re-direct criminal trajectories (Piquero et al. 2002, 2003). One such life event is the lack of educational achievement, which creates structural impediments that "knife off" important opportunities for conventional behavior. For example, lack of a high school diploma limits the acquisition of skills necessary for gainful and meaningful employment and makes it harder for individuals to secure stability in their work and home lives. As a result of weak educational achievement, weak ties to work and family are likely to ensue, thereby increasing the likelihood of crime (Gottfredson 2001). Conversely, successful education achievement, viewed as a positive label to prospective employers and partners, can be an important life event that can re-direct criminal trajectories. In this regard, educational success can open doors for conventional opportunities over the life course, and this may be especially relevant among delinquent youth who find themselves at a critical point where decisions and consequences can follow them into early adulthood and reverberate over the lifespan.[2]

In this regard, we are sensitive to Braithwaite's (2009) view that while labels can stigmatize counterproductively, information can also be learned as to where and when labels can confront educatively. More specifically, Braithwaite's (1989) reintegrative shaming theory suggests that persistence in crime will be diminished to the extent that previous offenders are re-integrated back into the community and not simply labeled and cast off without any chance at re-entry—and educational attainment can certainly help in this regard. Here, labeling calls for attention to human agency (Laub and Sampson 2003) and cognitive transformation (Giordano et al. 2002) in the life-course (Cullen 2009).

A limited literature supports the link between education, delinquency, and—among sanctioned offenders—recidivism. Katsiyannis and Archwamety (1997) report that deficits in basic skills and a history of receiving special education services are among the factors that discriminated recidivists from non-recidivists in their study of males in a Midwestern juvenile correctional facility. Brown et al. (2008) examined the school functioning and academic achievement of 157 youth who had brief contact with a state department of juvenile justice and then returned to the community, and also whether race was associated with achievement. Results showed that more than half of the subjects demonstrated problems in school functioning or academic performance after their contact with the juvenile justice system; specifically, Non-Caucasians, those who received special education services, or those who lived in an urban area had lower achievement. Baltodano et al. (2005) explored the relationship of disability and ethnicity to academic achievement among 157 incarcerated male youth in Arizona, including 87 Hispanics and 16 African–

[2] An anonymous reviewer noted that the school achievement and participation measures used herein can be considered and interpreted in several ways. Specifically, there is likely to be potential growth in skills coming from education but also positive labeling/renegotiation of labels insofar as prospective employers and partners react positively to individuals who have attained educational success. Of course, the two attributions are not mutually exclusive but, it is important to be explicit that educational experiences and attainment act upon re-offending in much the same way as other life events (marriage and employment) because they represent positive turning points/events that open doors for conventional success, broadly defined, and may re-orient previous crime trajectories.

Americans and found that about 30% of the youth were identified as eligible for special education and 65% were ethnic minorities. Unfortunately, these studies have not paid close attention to how educational achievement relates to patterns of re-offending among serious, youthful offenders in a methodologically rigorous manner.

Overall, we rely in this study on Sampson and Laub's (1997: 147) theory of cumulative disadvantage and its focus on understanding the structural impediments to establishing strong social ties to conventional lines of activity in education and employment. We use data from a large sample of juvenile delinquents released from Florida training schools that were followed for 1-year post-release to examine how educational achievement acts as a positive turning point that may re-direct previously criminal paths and can thus help former adjudicated delinquents re-negotiate their delinquent/criminal label.

Also, recognizing the virtually non-existent empirical research on the "…impact of ethnicity and disability on educational achievement within juvenile corrections" (Baltodano et al. 2005: 363), an important aspect of our study is its examination of the relationship between educational achievement and recidivism across race and sex. Such an investigation is relevant as both theory and previous research point toward important race/sex contingencies with respect to life events and crime. For example, Piquero et al. (2002) found that being married—viewed as a positive turning point and positive label—inhibited non-violent recidivism among White and non-White offenders, but common-law marriages were crime-generating among non-Whites compared to Whites.

Drawing from Sampson and Laub's hypothesis that delinquency and its negative consequences "mortgage" juveniles' future by stigmatizing them and forcing negative reactions toward them that result in structural impediments to their establishment of strong ties to conventional activity and achievement in education and employment—the following two research questions are addressed. First, does academic achievement while incarcerated relate to released delinquents return to school? Second, does attendance in school after release from incarceration relate to delinquents likelihood of re-arrest 1-year post-release? Comparisons across race and sex are the article's specific focus.

Data and Methods

This study uses data from a cohort of 4,147 youths released from 115 juvenile justice institutions throughout Florida during fiscal year 2000–2001. The cohort data were compiled from two different sources: the Florida Department of Education (DOE) and the Florida Department of Law Enforcement (FDLE). Data from DOE were used to identify youths released from residential commitment programs, measure student performance and school participation, and provide demographic information. All youth in Florida who are enrolled in public schools from pre-kindergarten through grade twelve, including juvenile justice, alternative, vocational/technical, charter, and adult education schools, are reported to DOE through the state's automated student data system. This student data includes demographic characteristics, disability information, academic transcript information, grade promotion and graduation status, school entry and withdrawal information, and school attendance. The cohort was then matched using name, date of birth, and numerical identifiers to arrest information obtained from FDLE. For the current study, data were used from each of the data sources: the year of release (fiscal year 2000–2001) and 1-year post-release follow-up (fiscal year 2001–2002).

Measures

Two key post-release outcome variables are considered: percentage of youth returning to school and percentage of re-arrests in a 1 year follow-up. Discriminating variables include: academic achievement while incarcerated, attendance in public school after release from incarceration, and two demographic variables: race and sex.

Return to School

This variable reflects whether or not a youth released from a residential facility in fiscal year 2000–2001 returned to a public school within one semester following their release from institutionalization. This involved searching the records of all Florida public schools including elementary, middle and secondary schools, charter schools, alternative schools, adult education programs, and vocational-technical schools. In Florida, youth who are 16 or older may drop out of school with parental permission, and although Florida has truancy requirements, many youth for various reasons do not return to school after release or remain in school for short periods of time with poor attendance before dropping out. Thus, this measure captures a youth's decision to continue participation in education following incarceration.

Re-Arrest

Using official arrest records, data were obtained on whether youth were re-arrested (no/yes) in the first-year following release from custody, which is the standard in recidivism research. The types of arrests reported to FDLE include all arrests submitted by local law enforcement agencies through booking and fingerprinting in local jails and

juvenile assessment centers. All youths in the cohort were observed within 12 months following their individual release dates, using their release date as the starting point. The use of official records to measure recidivism is conservative because it does not capture the offending that goes undetected. Still, most recidivism studies, as well as the Bureau of Justice Statistics recidivism studies, also employ official records.

Academic Achievement

Incarcerated youths are required by Florida law to attend school and cannot be suspended, expelled, or choose to drop out while they are incarcerated. Florida Statute §1003.52 (2)(6)(2006) requires that each juvenile justice educational program in Florida offer a minimum of 5 h per day (5 days per week) of direct educational instruction. Earning core academic credits is a measure of pupils' progression and achievement toward a high school diploma. Academic achievement was measured by the number and proportion of academic credits earned while incarcerated, and thus quantifies both the number of academic courses completed and the proportion of all educational credits earned (academic and elective) that were academic in nature (math, English, social studies, and science). This combined measure allows comparison of educational achievement among youths who were incarcerated for different lengths of time and disproportionately earned varying types of credits while incarcerated. Specifically, this measure of academic achievement was first calculated by the number of academic credits earned while incarcerated weighted by the proportion of academic credits in relation to the total school credits earned. *Z* scores were computed from weighted scores. The final measure of the level of academic achievement was measured based on whether the student was below or above the average on the scale score (below average = 0, above average = 1).

School Attendance

This was measured as the number of days youth were in attendance in public school after release from incarceration. Youth who had earned a high school diploma or GED prior to or during incarceration were not included in the analysis and those who did not return to school following release were also not included in the analysis. Those youth who graduated from high school following release were assigned the maximum amount of time possible in school as demonstrated by their attainment of a diploma. School attendance is calculated by adding all of the youth's attendance records in multiple schools between release and the 12-month follow-up. (Note: As some arrests occurred while the youths were enrolled in school and they remained enrolled subsequent to the arrest, the time-order of attendance to arrest has some level of error. But, it was true that most enrollment days were prior to the arrest.)

Demographics

Two demographic characteristics are of specific interest in the current study, race and sex, both of which have well established associations with educational achievement and recidivism. Males have been found to have higher rates of re-arrest and lower educational achievement compared to females, while minorities (especially Blacks) evince lower educational achievement and recidivate both more quickly and at higher rates than non-minorities (Bureau of Justice Statistics 2002). These mean-level differences across race/sex in educational achievement should translate into differential recidivism rates across the groups as well. It is important to control for these two variables in recidivism analysis, as the literature reviewed above suggests that there may be differences in the effect of certain life events/labels on offending.

Analytic Strategy

Because of limited research examining demographic differences in the relationship between educational achievement and criminal activity among delinquents, our study examines race and sex differences on two dimensions. First, we explore differences in the percentage of youth returning to school post-release for those with above or below average academic achievement while incarcerated.[3] Second, we explore differences in the percentage of re-arrest within 1-year post-release for those with above average versus below average attendance in public schools after release from incarceration. Also, since we employ non-experimental data in order to assess these questions, we must consider alternative methodological approaches that attempt to deal with the selection problem (in that individuals exercise some degree of choice with regard to

[3] The continuous measure of academic achievement while incarcerated was dichotomized at the mean to distinguish youth who had excelled in the classroom while incarcerated relative to those who had under-achieved academically based on the number of academic credits earned and the proportion of academic credits relative to the total of academic and elective credits. Similarly, those youth who had above average attendance in public schools post-release were differentiated from those with below average attendance. We performed several alternative cut-points as a sensitivity analysis, including a median split and another one in which the measures were trichotomized and cases in the upper third of the distribution were defined as high academic achievers and exhibiting high school attendance. The results using these alternative cut-points were substantively the same as those produced when using the mean as the cut-point.

the event(s) experienced) as best as possible (Apel and Sweeten 2010: 543). We use matching techniques which attempt to "identify, for each individual in a treatment condition, at least one other individual in a comparison condition that 'looks like' the treated individual on the basis of a vector of measured characteristics that may be relevant to the treatment and response in question" (Apel and Sweeten 2010: 543). This "selection on observables" approach to causal effect estimation is a common method for dealing with non-experimental data (Heckman and Hotz 1989), falling under the rubric of propensity score analysis (Rubin 2008).

The following steps were taken to conduct the propensity score matching. The first was to calculate propensity scores for each youth in our cohort through a logistic regression model using STATA 10.1, which included all the independent variables presented in Table 1.[4] These scores range from 0 to 1 and quantify the conditional probability of each youth having above average school attendance. Second, a diagnostic test was conducted to determine if balance was achieved for each covariate across the treatment, i.e., youth with above average school attendance, and comparison group. If balance is achieved, cases in the treated group should, on average, be identical to those in the comparison group on the observable covariates. We are limited to the covariates available when deriving equivalent groups to compare on the dependent variables, which is a limitation of any matching methodology. Yet, balance was achieved as evinced by the fact that the difference between the average propensity score of the treated and comparison group within the five strata was not statistically different. Third, we then used the one-to-one nearest neighbor matching algorithm with the caliper width set to .005 to identify the propensity score of each case in the treatment group and then retain a case in the comparison group with the closest propensity score possible. The no replacement option was used to ensure that once a youth in the treatment group was selected, they could not be used subsequently to match to another case in the comparison group.[5] These same steps were applied to the academic achievement variable described previously. This process resulted in a matched sample of 615 cases with above academic achievement while incarcerated and 615 matched cases below academic achievement while incarcerated for the first research question (Table 1), and a matched sample of 571 youth with above average attendance in public school after release from incarceration versus 571 matched cases with below average attendance in public school after release from incarceration for the second research question (Table 2). Tables 1 and 2 compare youth on covariates for the full and matched (nearest-neighbor matching without replacement) samples. As shown, the matching procedure—based on the covariates used for matching—was effective in eliminating any potential differences across the various groups in both Tables. As a result of this methodological approach, our analyses provide percentage differences across the comparison groups, indicating any differences in key outcomes and whether the differences are significant across groups. Of course, it is important to bear in mind that when matching, one makes an assumption of strongly ignorable treatment assignment, which means that (for better or worse) one is assuming that the treatment is randomly assigned as would be the case in a true randomized experiment. Rejecting the null hypothesis using a simple test for difference in group means is akin to rejecting a null hypothesis of no treatment effect and demonstrates that

[4] We were unable to compare the initial cohort of cases to those analyzed using PSM because the dataset created when the PSM models were generated did not include the case identifier (which was originally prohibited from inclusion by confidentiality agreements). Only the variables used in the models and those generated in STATA, such as whether those cases that matched were in the control/experimental group and cases that did not match, were available. And although we are unable to determine precisely the overlap between the two samples, we are confident that the overlap was very good. Nevertheless, we compared the mean values of the covariates in the PSM models reported in Tables 3 and 4 across cases that matched versus those that did not. For Table 3, i.e., academic achievement while incarcerated and returning to school post-release, we found the following: Of the 11 covariates in the model, four of the mean differences across the matched and non-matched cases were not significant. Of those that were significant, the percentage difference in the mean was below 5% for one variable, two were between 5 and 10%, and four were above 10%. For Table 4, i.e., attendance in school post-release and re-arrest, the mean differences across the matched and non-matched cases were not significant for seven of the covariates, one was different by less than 5%, and three greater than 10% different. While these comparisons indicate some instances in which there is some level of variability across the matched and non-matched cases, we do not believe that they are egregious enough to prevent faith in the analyses, results, and conclusions with the appropriate caveats noted above.

[5] The 11 covariates in Table 1 were used to conduct the propensity score matching. Balance across the treated and comparison groups was achieved as evidenced by no significant differences in the propensity scores within the strata, indicating exposure to the treatment (above average academic achievement and above average school attendance) is random. The covariates of age at release and length of incarceration could possibly be considered inappropriate for inclusion in the matching process because they could be considered occurring after the treatment assignment. For the following reasons, it was determined that retaining these variables was appropriate. First, the length of incarceration and age at release have consistently been shown to be important control variables in recidivism studies and excluding them would reduce the explanatory power of the models. Second, these measures would likely influence treatment assignment because both could impact how much education a youth receives while incarcerated and their level of attendance in school post release. Finally, research has included these same variables in propensity score matching analysis in examining the impact of the treatment effect of Supermax confinement on recidivism (Mears and Bales 2009).

Table 1 *t* test results comparing youth with below and above average academic achievement on covariates for the full and matched samples

	Full sample			Matched sample		
	Below average ($n = 1{,}300$)	Above average ($n = 823$)	*t* value	Below average ($n = 615$)	Above average ($n = 615$)	*t* value
Age grade level	0.66 (.01)	0.35 (.02)	13.87***	0.47 (.02)	0.49 (.02)	−0.80
Age at release	17.54 (.03)	16.65 (.03)	19.29***	17.21 (.05)	17.17 (.04)	−0.74
Black	0.46 (.01)	0.47 (.02)	−0.38***	0.44 (.02)	0.43 (.02)	0.23
Hispanic	0.07 (.01)	0.08 (.01)	−0.60	0.07 (.01)	0.08 (.01)	−0.33
Male	0.85 (.01)	0.86 (.01)	−0.70	0.82 (.02)	0.84 (.02)	−0.53
Behavioral disability	0.19 (.01)	0.24 (.02)	−2.80**	0.22 (.02)	0.23 (.02)	−0.41
Learning disability	0.11 (.01)	0.15 (.01)	−3.46***	0.13 (.01)	0.12 (.01)	0.43
Prior criminal record	131.96 (4.3)	129.71 (4.77)	0.12	138.61 (5.7)	139.63 (5.53)	−0.13
Age at first arrest	14.59 (.05)	13.89 (.06)	8.52***	14.35 (.07)	14.42 (.07)	−0.68
Level of incarceration	2.27 (.02)	2.20 (.02)	2.27*	2.34 (.02)	2.33 (.02)	0.15
Length of incarceration	8.21 (.11)	7.99 (.14)	0.92	8.88 (.16)	8.89 (.14)	−0.07

* $P < .05$, ** $P < .01$, *** $P < .001$

Nearest-neighbor matching without replacement was used to generate the matched sample and standard errors are reported in parentheses. *Level of Incarceration*: the security level of the facility assigned by the Juvenile Court Judge (1 = low, 2 = moderate, 3 = high, 4 = maximum); *Length of Incarceration*: number of months in a residential facility; *Prior Criminal Record*: total seriousness score of all arrest events reported to Florida Department of Law Enforcement prior to commitment; *Age at First Arrest*: the age of the youth when they received their first arrest record from Florida Department of Law Enforcement; *Learning Disability and Behavioral Disability*: youth diagnosed with Behavioral or Learning Disabilities (0 = No Disability, 1 = Disability); *Age Grade Level*: number of years behind in school based on youth's age and current grade enrolled at release from a residential commitment facility (behind in school by one or less years = 0, more than 1 year behind in school = 1); *Age at Release*: age at release based on release date and date of birth; *Black, Hispanic, and Male* are coded 1 if the subject is in that group compared to non-Black, non-Hispanic, and Female

such an effect is present between the groups. We are concerned with attendance, which can be thought of as a moderator variable.

Results

Table 3 presents the results for our first research question: is there a difference in the percentage of youth returning to school post-release for those with above or below average academic achievement while incarcerated? Among all youth, those with above—compared to below—average academic achievement while incarcerated were significantly more likely to return to school post-release, with an observed difference of 10%. Across sex, the substantive finding held for both males and females: youth with above average academic achievement while incarcerated were more likely to return to school post-release. Among males, the difference was 13%, while among females it was 11.4%, but the differences were only significant for males. Across race, once again youth with above average academic achievement while incarcerated were more likely to return to school post-release. Among Whites, the difference was only 6% (and not significant), but among Blacks, the difference was 12.5% and significant. A final comparison was made for White males and Black males, as again the findings showed that youth with above average academic achievement while incarcerated were significantly more likely to return to school post-release than those with below average academic achievement, a finding that was significant for both White males (a 9.9% difference) and Black males (a 15.1% difference). The largest difference and the highest percentage of returning to school post-release was observed for Black males with above average academic achievement while incarcerated. Unfortunately, the sample sizes for White females and Black females were too small to warrant valid comparisons in the likelihood of returning to school post-release across levels of academic achievement while incarcerated.

Table 4 presents the findings for our second research question: is there a difference in the percentage of re-arrests within 1-year post-release from incarceration for those with above average versus below average attendance in public schools? Among all youths, those with below average attendance in public school were significantly more likely to be re-arrested (52.4%) in the 1-year post-release period than those youth with above average attendance in public school (40.8%). With respect to sex, the substantive results hold, as those youth with above average attendance in public school were significantly less likely to be

Table 2 *t* test results comparing youth returning to school post-release for those with above or below average academic achievement while incarcerated on covariates for the full and matched samples

	Full sample			Matched sample		
	Below average ($n = 1{,}300$)	Above average ($n = 823$)	*t* value	Below average ($n = 571$)	Above average ($n = 571$)	*t* value
Age grade level	0.45 (.02)	0.31 (.02)	5.47***	0.30 (.02)	0.31 (.02)	−0.19
Age at release	16.52 (.04)	16.23 (.04)	4.92***	16.24 (.05)	16.24 (.04)	0.03
Black	0.50 (.02)	0.49 (.02)	0.39	0.50 (.02)	0.49 (.02)	0.53
Hispanic	0.08 (.01)	0.07 (.01)	0.11	0.07 (.01)	0.07 (.01)	−0.12
Male	0.84 (.01)	0.86 (.01)	−0.90	0.86 (.01)	0.85 (.01)	0.25
Behavioral disability	0.21 (.02)	0.22 (.02)	−0.55	0.24 (.02)	0.22 (.02)	1.06
Learning disability	0.16 (.01)	0.18 (.01)	−0.59	0.19 (.02)	0.18 (.02)	0.46
Prior criminal record	143.70 (5.3)	120.20 (4.15)	3.48***	120.40 (4.88)	121.20 (4.66)	−0.12
Age at first arrest	13.96 (.06)	13.73 (.06)	2.58**	13.75 (.07)	13.75 (.07)	−0.04
Level of incarceration	2.21 (.02)	2.17 (.02)	1.20	2.17 (.02)	2.17 (.02)	0.00
Length of incarceration	7.94 (.14)	7.99 (.15)	−0.26	7.95 (.16)	8.03 (.17)	−0.38

** $P < .01$, *** $P < .001$

Nearest-neighbor matching without replacement was used to generate the matched sample and standard errors are reported in parentheses. *Level of Incarceration*: the security level of the facility assigned by the Juvenile Court Judge (1 = low, 2 = moderate, 3 = high, 4 = maximum); *Length of Incarceration*: number of months in a residential facility; *Prior Criminal Record*: total seriousness score of all arrest events reported to Florida Department of Law Enforcement prior to commitment; *Age at First Arrest*: the age of the youth when they received their first arrest record from Florida Department of Law Enforcement; *Learning Disability and Behavioral Disability*: youth diagnosed with Behavioral or Learning Disabilities (0 = No Disability, 1 = Disability); *Age Grade Level*: number of years behind in school based on youth's age and current grade enrolled at release from a residential commitment facility (behind in school by one or less years = 0, more than 1 year behind in school = 1); *Age at Release*: age at release based on release date and date of birth; *Black, Hispanic, and Male* are coded 1 if the subject is in that group compared to non-Black, non-Hispanic, and Female

Table 3 Differences in percentage of youth returning to school post-release for those with above or below average academic achievement while incarcerated: using one-to-one nearest-neighbor matching without replacement

	Above average academic achievement (%)	Below average academic achievement (%)	Difference (%)	Standard error	*t* value[a]
All youth	47.8	37.6	10.2	0.028	3.65***
Sex					
Males	48.1	35.0	13.1	0.030	4.27***
Females	45.6	34.2	11.4	0.078	1.46
Race					
White	44.9	38.3	6.6	0.041	1.61
Black	47.9	35.4	12.5	0.043	2.88***
Race and sex[a]					
White males	46.7	36.8	9.9	0.044	2.22*
Black males	52.4	37.3	15.1	0.048	3.15**

* $P < .05$, ** $P < .01$, *** $P < .001$ (two-tailed test)

The matched sample was created using propensity score analysis (1-to-1 nearest-neighbor matching without replacement algorithm and with caliper set to .005). Matched *N*'s = 615 above academic achievement while incarcerated versus 615 matched below academic achievement while incarcerated

[a] The sample sizes for white females and black females were too small to warrant valid comparisons in the likelihood of returning to school across levels of academic achievement

re-arrested in the follow-up compared to those youth with below average attendance. The difference for males (15.1% across the two attendance groups) was significant, but the difference among females (4.7%) was not significant. Race comparisons also suggest beneficial effects of above average attendance in public schools, as Whites and Blacks both

Table 4 Differences in the percentage of youth re-arrested within 1 year post-release among those with above average versus below average attendance in public school after release from incarceration: using one-to-one nearest-neighbor matching without replacement

	Above average attendance in public school (%)	Below average attendance in public school (%)	Above vs. below average attendance difference (%)	Standard error	*t* value
All Youth	40.8	52.4	−11.6	0.029	3.94***
Sex					
Males	43.3	58.4	−15.1	0.032	4.68***
Females	25.0	29.7	−4.7	0.079	−0.59
Race					
White	36.1	45.9	−9.9	0.045	−2.17*
Black	47.8	59.0	−11.2	0.044	−2.52**
Race and sex[a]					
White males	44.4	60.6	−16.2	0.048	−3.41***
Black males	46.2	59.4	−13.1	0.048	−2.74**

* $P < .05$, ** $P < .01$, *** $P < .001$ (two-tailed test)

The matched sample was created using propensity score analysis (a 1-to-1 nearest-neighbor matching without replacement algorithm and with caliper set to .005). For all youth, matched N's = 571 with above average attendance in public school versus 571 matched cases with below average attendance in public school after release from incarceration

[a] The sample sizes for white females and black females were too small to warrant valid comparisons in the likelihood of re-arrest within 1 year for different levels of public school attendance after release from incarceration

have a significantly lower likelihood of re-arrest given above average attendance in public school. Finally, White males and Black males who have above average attendance in public school are significantly less likely than their below average attendance counterparts to be re-arrested in the 1-year follow-up.

In sum, while it is true that males and Blacks have a higher likelihood of re-arrest in the 1-year follow-up, it is also the case that across most comparisons in Table 4, above average attendance in school after release from incarceration yields a lower likelihood of re-arrest. The preventive effects of school attendance are similar across race and sex suggesting that education can be a part of a larger prevention effort. Specifically, school attendance assists juvenile offenders in the re-entry process, and educational achievement appears to provide a positive life event that can deflect previously criminal trajectories.

Discussion

Employing Sampson and Laub's cumulative disadvantage thesis, this article examined whether academic achievement was a positive turning point for juvenile delinquents that could help in re-directing their paths away from criminal activity in the short-term. Two questions were addressed. First, does academic achievement while incarcerated increase the likelihood of released delinquents' return to school? Second, does attendance in school after release reduce the likelihood of delinquent's re-arrest 1-year post-release? Because of the lack of prior research on these questions across demographic subgroups, our analysis specifically focused on race and sex comparisons with data from a sample of juvenile delinquents released from Florida correctional institutions. Two key findings emerged.

First, youth with above—compared to below—average academic achievement while incarcerated were significantly more likely to return to school post-release. Second, those youth with above average attendance in public school were significantly less likely to be re-arrested in the 1-year post-release period than those youth with below average attendance in public school. Importantly, while these education turning points were observed across race and sex, the gains in academic achievement even while incarcerated among Black youth were disproportionately higher and this positive life event seems to carry forward with them into the community as they turn away from further criminal activity.

Our findings bear relevance for matters related to both theory and policy. The major results, that youth with above average academic achievement while incarcerated are significantly more likely to return to school post-release and that youth with above average attendance in public school are significantly less likely to be re-arrested in the1-year post-release period, underscore the potential that positive life events have for re-directing previously criminal paths. And while this specific finding is germane to Sampson and Laub's informal social control thesis, the beneficial effect of educational achievement even among former delinquents indicates that labels are not always negative or permanent as traditionally argued by labeling

theory. In fact, labels can also be positive as individuals' self-image and actions change through particular positive interactions and experiences. Thus, modifications to traditional conceptualizations of labeling might be in order and could include Braithwaite's reintegrative shaming thesis, which suggests that labels can be both positive and educative and help offenders turn away from crime and re-integrate successfully into their communities, which may be more likely to embrace educated individuals as they will be better candidates for gainful employment.

The theoretical implications of our race-based comparisons are also worth noting. Our study showed that Blacks gained substantially from academic achievement while incarcerated, such that they were more likely to return to school post-release and that above average attendance in public school after release was associated with lower re-arrest. Thus, and perhaps because their lower starting point, Blacks may have evinced these gains in large part because they had more room to gain (than Whites) from the benefits of educational experiences and achievement. With respect to the theoretical perspectives outlined earlier, the results show that Black offenders can experience positive life events which can serve a potential turning point away from crime. Turning points can have positive effects across race (and sex) and previous disadvantages and negative labels can be altered into advantages and positive labels even among individuals suffering from racism, sexism, and classism. Borrowing from DiPrete and Eirich's (2006) cumulative advantage framework, educational achievement can act as an initial cumulative advantage which becomes a resource that produces further relative gains—one of which is lower recidivism.

This research has implications for policy and interventions aimed at increasing educational achievement, and lowering recidivism. We begin with the observation that delinquents enter a juvenile justice system that must do more than simply 'house' them until their release. Thus, it is instructive to consider what the juvenile correction system can do, once they admit a delinquent youth, in order to provide them some tools for success once they are released. As juvenile correctional institutions are comprised largely of youth who have disproportionately low academic achievement (Foley 2001) and disproportionately high learning disabilities (Quinn et al. 2005), it seems that at a minimum, the juvenile justice system can play some role in identifying and responding to the academic needs of delinquent youth.

To elaborate, Lochner and Moretti's (2004) study that reported a preventive effect of education on crime also showed that the social savings from the education-based (associated with high school graduation) crime reduction was between 14 and 26% of the private return. Investing in education as an intervention-based effort among juvenile offenders seems like a smart crime prevention measure that can have lasting and meaningful impacts not only on crime but also in helping provide the human capital needed to open important doors for conventional success in employment, health, and relationship quality (Blank 2001; Cohen et al. 2010; Finn 2006). That such efforts help delinquents—regardless of sex or race—provides further support for adopting such efforts.

More generally, communities and governments need to invest their resources in education as early in the life course as possible and should seek to find ways to diminish perceived barriers to educational success. Because these barriers tend to start very early in the life course (McWhirter 1997) and may in turn become self-fulfilling, there is a need to create open access, encouragement, empowerment, and reward structure to all students. And because negative experiences and barriers can thwart the cumulative advantage(s) that build up through successful academic sequences and create negative outcomes in various life domains, programs that seek to improve educational attainment, and in turn, "reconnect" those who are out of school back into school (including delinquents) are also worth pursuing. In fact, some programs that identify at-risk youth early and provide them with intensive academic and personal services such as small learning communities appear to be effective, as are programs designed to improve attendance and those that combined the last few years of high school with community/technical training/college (Heinrich and Holzer 2010). The point is that it may never be too late to reconnect dropouts and those needing educational assistance back into the educational system and, in turn, it may never be too late to help turn juvenile delinquents away from a life of crime (Piquero et al. 2010).

At the same time that our findings are helpful for theoretical and policy discussions, several study limitations need to be noted. First, data were unavailable to demonstrate the intervening mechanisms between education and recidivism. Still, our findings are consistent with the notion that certain life events (i.e., education achievements, marriage, employment) may offer a mechanism by which offenders can turn away from crime. Second, our principle outcome variable, recidivism, was based on official records and thus we could not assess the effect of education on offending that escaped detection and/or processing by the criminal justice system. Third, while we found a positive effect for education across all subgroups, thereby indicating that education appears to be an important policy consideration that is widely applicable, data limitations precluded our probing of the theoretical mechanisms that underlie the educational achievement/crime relationship. For example, did education alter the youths' image? Did education open other avenues for conventional opportunities? Did education alter previously delinquent social

contexts? All of these are important to consider in future inquiries, especially as the findings may relate to labeling theory. Fourth, although we were able to consider several key variables in our matching procedure, there will always be some that are unavailable and that would be useful to consider in relation to recidivism. Finally, although it is true that most offenders who fail do so quickly (within a year), it is important that future research use a longer follow-up period in order to assess whether educational experiences continue to prevent re-offending.

With these limitations in hand, it is clear from findings reported here that educational achievement for incarcerated youths can positively impact their reentry following release by increasing their likelihood of return to school, thereby reducing their likelihood of re-arrest. Very importantly, since the 2001 passage of the No Child Left behind (NCLB) act, the quality of juvenile justice education throughout the country has experienced marked improvements. These improvements have been most pronounced in the hiring more highly more qualified teachers, providing individual instruction and holding their educational practices and outcomes accountable as required by NCLB's requirements for juvenile justice education. This means that of the several hundred thousand youth released annually from the nation's juvenile justice institutions, many had experienced greater educational achievement because of the NCLB's mandates which, in turn, was increasing their chances for successful community reentry. However, because of the failure to reauthorize NCLB and the economic recession that has impacted all states throughout the nation, we are close to erasing many of the recent juvenile justice education gains. Certainly, when juvenile justice education funding needs are considered in relation to the funding needs of public schools, public schools receive funding priority. But such funding competition is counterproductive for the healthy future of the county. Quality and effective education of all youth, delinquent of not, is not an option but rather a necessity. It now appears likely that without federal leadership and the rewrite of NCLB the country will return to the more than century old practice of viewing the incarcerated population of delinquents as educationally disposable despite evidence to the contrary.

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