Bruce Western & Becky Pettit

Incarceration & social inequality

In the last few decades, the institutional contours of American social inequality have been transformed by the rapid growth in the prison and jail population.[1] America's prisons and jails have produced a new social group, a group of social outcasts who are joined by the shared experience of incarceration, crime, poverty, racial minority, and low education. As an outcast group, the men and women in our penal institutions have little access to the social mobility available to the mainstream. Social and economic disadvantage, crystallizing in penal confinement, is sustained over the life course and transmitted from one generation to the next. This is a profound institutionalized inequality that has renewed race and class disadvantage. Yet the scale and empirical details tell a story that is largely unknown.

Though the rate of incarceration is historically high, perhaps the most important social fact is the inequality in penal confinement. This inequality produces extraordinary rates of incarceration among young African American men with no more than a high school education. For these young men, born since the mid-1970s, serving time in prison has become a normal life event.

The influence of the penal system on social and economic disadvantage can be seen in the economic and family lives of the formerly incarcerated. The social inequality produced by mass incarceration is sizable and enduring for three main reasons: it is invisible, it is cumulative, and it is intergenerational. The inequality is invisible in the sense that institutionalized populations commonly lie outside our official accounts of economic well-being. Prisoners, though drawn from the lowest rungs in society, appear in no measures of poverty or unemployment. As a result, the full extent of the disadvantage of groups with high incarceration rates is underestimated. The inequality is cumulative because the social and economic penalties that flow from incarceration are accrued by those who already have the weakest economic opportunities. Mass incarceration thus deepens disadvantage and forecloses mobility for the most marginal in society. Finally, carceral inequalities are intergenerational, affecting not just those who go to prison and jail but their families and children, too.

The scale of incarceration is measured by a rate that records the fraction of the

© 2010 by the American Academy of Arts & Sciences

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

population in prison or jail on an average day. From 1980 to 2008, the U.S. incarceration rate climbed from 221 to 762 per 100,000. In the previous five decades, from the 1920s through the mid-1970s, the scale of punishment in America had been stable at around 100 per 100,000. Though the incarceration rate is now nearly eight times its historic average, the scale of punishment today gains its social force from its unequal distribution.

Like criminal activity, prisons and jails are overwhelmingly a male affair. Men account for 90 percent of the prison population and a similar proportion of those in local jails. The incarceration rate has been growing faster among women in recent decades, but the social impact of mass incarceration lies in the gross asymmetry of community and family attachment. Women remain in their communities raising children, while men confront the possibility of separation through incarceration.[2] Age intensifies these effects: incarceration rates are highest for those in their twenties and early thirties. These are key years in the life course, when most men are establishing a pathway through adulthood by leaving school, getting a job, and starting a family. These years of early adulthood are important not just for a man's life trajectory, but also for the family and children that he helps support.

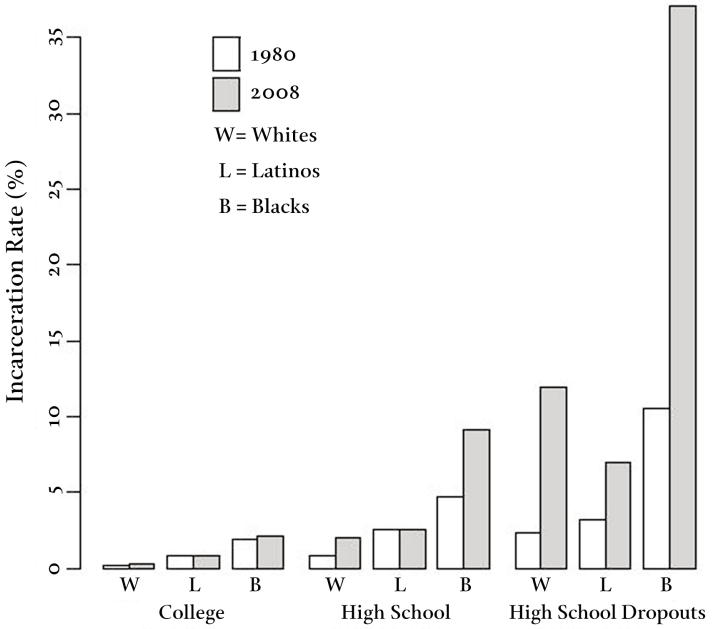
Age and sex are the staples of demographic analysis, and the relative youth of the largely male incarcerated population foreshadows much about the effects of mass incarceration. Still, it is the profound race and class disparities in incarceration that produce the new class of social outsiders. African Americans have always been incarcerated at higher rates than whites, at least since statistics were available from the late nineteenth century. The extent of racial disparity, however, has varied greatly over the past century, following a roughly inverse relationship to the slow incorporation of African Americans as full citizens in American society. In the late nineteenth century, U.S. Census data show that the incarceration rate among African Americans was roughly twice that of whites. The demographic erosion of Jim Crow through the migration of Southern African Americans to the North increased racial disparity in incarceration through the first half of the twentieth century. (Racial disparities in incarceration have always been higher in the North than the South.) By the late 1960s, at the zenith of civil rights activism, the racial disparity had climbed to its contemporary level, leaving African Americans seven times more likely to be in prison or jail than whites.

Class inequalities in incarceration are reflected in the very low educational level of those in prison and jail. The legitimate labor market opportunities for men with no more than a high school education have deteriorated as the prison population has grown, and prisoners themselves are drawn overwhelmingly from the least educated. State prisoners average just a tenth grade education, and about 70 percent have no high school diploma.[3]

Disparities of race, class, gender, and age have produced extraordinary rates of incarceration among young African American men with little schooling. Figure 1 shows prison and jail incarceration rates for men under age thirty-five in 1980, at the beginning of the prison boom, and in 2008, after three decades of rising incarceration rates. The figure reports incarceration separately for whites, Latinos, and African Americans and separately for three levels of education. Looking at men with a college edu-

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

Figure 1
Percentage of Men Aged Twenty to Thirty-Four in Prison or Jail, by Race/Ethnicity and Education, 1980 and 2008



Source: Becky Pettit, Bryan Sykes, and Bruce Western, "Technical Report on Revised Population Estimates and NLSY79 Analysis Tables for the Pew Public Safety and Mobility Project" (Harvard University, 2009).

cation, we see that incarceration rates today have barely increased since 1980. Incarceration rates have increased among African Americans and whites who have completed high school. Among young African American men with high school diplomas, about one in ten is in prison or jail.

Most of the growth in incarceration rates is concentrated at the very bottom, among young men with very low levels of education. In 1980, around 10 percent of young African American men who dropped out of high school were in prison or jail. By 2008, this incarceration rate had climbed to 37 percent, an astonishing level of institutionalization given that the average incarceration rate in the general population was 0.76 of 1 percent. Even among young white dropouts, the incarceration rate had grown remarkably, with around one in eight behind bars by 2008. The significant growth of incarceration rates among the least educated reflects increasing class inequality in incarceration through the period of the prison boom.

These incarceration rates provide only a snapshot at a point in time. We can also examine the lifetime chance of incarceration – that is, the chance that someone will go to prison at some point in his or her life. This cumulative risk of incarceration is important if serving time in prison confers an enduring status that affects life chances after returning to free society. The lifetime risk of imprisonment describes how many

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

Table 1
Cumulative Risk of Imprisonment by Age Thirty to Thirty-Four for Men Born from 1945 to 1949 and 1975 to 1979, by Educational Attainment and Race/Ethnicity

	All	High School Dropouts	High School/ GED*	College
1945 – 1949 cohort				
White	1.4	3.8	1.5	0.4
Black	10.4	14.7	11.0	5.3
Latino	2.8	4.1	2.9	1.1
1975 – 1979 cohort				
White	5.4	28.0	6.2	1.2
Black	26.8	68.0	21.4	6.6
Latino	12.2	19.6	9.2	3.4

*Denotes completed high school or equivalency.
Source: Becky Pettit, Bryan Sykes, and Bruce Western, "Technical Report on Revised Population Estimates and NLSY79 Analysis Tables for the Pew Public Safety and Mobility Project" (Harvard University, 2009).

people are at risk of these diminished life chances.

We calculated the cumulative chance of imprisonment for two birth cohorts, one born just after World War II, from 1945 to 1949, and another born from 1975 to 1979 (Table 1). For each cohort, we calculated the chances of imprisonment, not jail incarceration. Prisons are the deep end of the criminal justice system, now incarcerating people for an average of twenty-eight months for a felony conviction. While there are about ten million admissions to local jails each year – for those awaiting trial or serving short sentences – around seven hundred thousand prisoners are now admitted annually to state and federal facilities.

These cumulative chances of imprisonment are calculated up to age thirty-four. For most of the population, this represents the lifetime likelihood of serving prison time. For the older postwar cohort who reached their mid-thirties at the end of the 1970s, about one in ten African American men served time in prison. For the younger cohort born from 1975 to 1979, the lifetime risk of imprisonment for African American men had increased to one in four. Prison time has become a normal life event for African American men who have dropped out of high school. Fully 68 percent of these men born since the mid-1970s have prison records. The high rate of incarceration has redrawn the pathway through young adulthood. The main sources of upward mobility for African American men – namely, military service and a college degree – are significantly less common than a prison record. For the first generations growing up in the post–civil rights era, the prison now looms as a significant institutional influence on life chances.

The ubiquity of penal confinement in the lives of young African American men

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

with little schooling is historically novel, emerging only in the last decade. However, this new reality is only half the story of understanding the significance of mass incarceration in America. The other half of the story concerns the effects of incarceration on social and economic inequality. The inequalities produced by contemporary patterns of incarceration have three characteristics: the inequalities associated with incarceration are invisible to our usual accounting of the economic well-being of the population; the inequality is cumulative, deepening the disadvantage of the most marginal men in society; and finally, the inequality is intergenerational, transmitting the penalties of a prison record from one generation to the next. Because the characteristic inequalities produced by the American prison boom are invisible, cumulative, and intergenerational, they are extremely enduring, sustained over lifetimes and passed through families.

Invisible Inequality. The inequality created by incarceration is often invisible to the mainstream of society because incarceration is concentrated and segregative. We have seen that steep racial and class disparities in incarceration have produced a generation of social outliers whose collective experience is wholly different from the rest of American society. The extreme concentration of incarceration rates is compounded by the obviously segregative function of the penal system, which often relocates people to far-flung facilities distant from their communities and families. As a result, people in prison and jail are disconnected from the basic institutions – households and the labor market – that dominate our common understanding and measurement of the population. The segregation and social concentration of incarceration thus help conceal its effects. This fact is particularly important for public policy because in assessing the social and economic well-being of the population, the incarcerated fraction is frequently overlooked, and inequality is underestimated as a result.

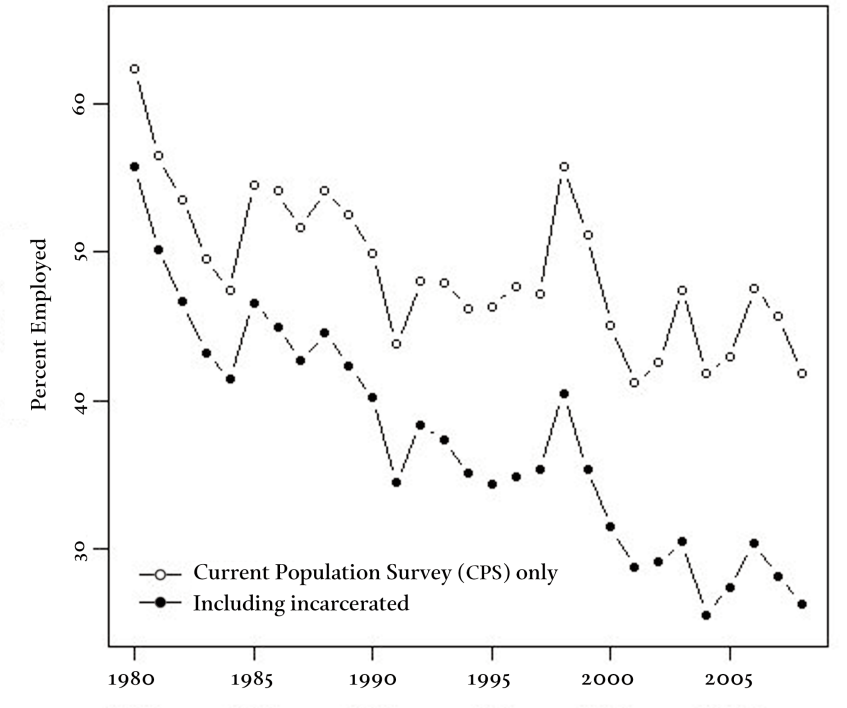
The idea of invisible inequality is illustrated by considering employment rates as they are conventionally measured by the Current Population Survey, the large monthly labor force survey conducted by the Census Bureau. For groups that are weakly attached to the labor market, like young men with little education, economic status is often measured by the employment-to-population ratio. This figure, more expansive than the unemployment rate, counts as jobless those who have dropped out of the labor market altogether. The Current Population Survey is drawn on a sample of households, so those who are institutionalized are not included in the survey-based description of the population.

Figure 2 shows the employment-to-population ratio for African American men under age thirty-five who have not completed high school. Conventional estimates of the employment rate show that by 2008, around 40 percent of African American male dropouts were employed. These estimates, based on the household survey, fail to count that part of the population in prison or jail. Once prison and jail inmates are included in the population count (and among the jobless), we see that employment among young African American men with little schooling fell to around 25 percent by 2008. Indeed, by 2008 these men were more likely to be locked up than employed.

Cumulative Inequality. Serving time in prison or jail diminishes social and economic opportunities. As we have seen, these diminished opportunities are found among those already most socioeconomically disadvantaged. A

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

Figure 2
Employment to Population Ratio, African American Men Aged Twenty to Thirty-Four with Less than Twelve Years of Schooling, 1980 to 2008



Source: Becky Pettit, Bryan Sykes, and Bruce Western, "Technical Report on Revised Population Estimates and NLSY79 Analysis Tables for the Pew Public Safety and Mobility Project" (Harvard University, 2009).

burgeoning research literature examining the economic effects of incarceration finds that incarceration is associated with reduced earnings and employment.[4]

We analyzed panel data from the National Longitudinal Survey of Youth (NLSY), one of the few surveys that follows respondents over a long period of time and that interviews incarcerated respondents in prison. The NLSY began in 1979, when its panel of respondents was aged fourteen to twenty-one; it completed its latest round of interviews in 2006. Matching our population estimates of incarceration, one in five African American male respondents in the NLSY has been interviewed at some point between 1979 and 2006 while incarcerated, compared to 5 percent of whites and 12 percent of Latino respondents. Analysis of the NLSY showed that serving time in prison was associated with a 40 percent reduction in earnings and with reduced job tenure, reduced hourly wages, and higher unemployment.

The negative effects of incarceration, even among men with very poor economic opportunities to begin with, are related to the strong negative perceptions employers have of job seekers with criminal records. Devah Pager's experimental research has studied these employer perceptions by sending pairs of

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

fake job seekers to apply for real jobs.[5] In each pair, one of the job applicants was randomly assigned a résumé indicating a criminal record (a parole officer is listed as a reference), and the "criminal" applicant was instructed to check the box on the job application indicating he had a criminal record. A criminal record was found to reduce callbacks from prospective employers by around 50 percent, an effect that was larger for African Americans than for whites.

Incarceration may reduce economic opportunities in several ways. The conditions of imprisonment may promote habits and behaviors that are poorly suited to the routines of regular work. Time in prison means time out of the labor force, depleting the work experience of the incarcerated compared to their nonincarcerated counterparts. The stigma of a criminal conviction may also repel employers who prefer job applicants with clean records. Pager's audit study offers clear evidence for the negative effects of criminal stigma. Employers, fearing legal liability or even just unreliability, are extremely reluctant to hire workers with criminal convictions.

A simple picture of the poor economic opportunities of the formerly incarcerated is given by the earnings mobility of men going to prison compared to other disadvantaged groups. The NLSY data can be used to study earnings mobility over several decades. We calculated the chances that a poor man in the lowest fifth of the earnings distribution in 1986 would move up and out of the lowest fifth by 2006. Among low-income men who are not incarcerated, nearly two-thirds are upwardly mobile by 2006 (Figure 3). Another group in the NLSY has very low levels of cognitive ability, scoring in the bottom quintile of the Armed Forces Qualifying Test, the standardized test used for military service. Among low-income men with low scores on the test, only 41 percent are upwardly mobile. Upward mobility is even less common among low-income high school dropouts. Still, we observe the least mobility of all among men who were incarcerated at some point between 1986 and 2006. For these men, only one in four rises out of the bottom quintile of the earnings distribution.

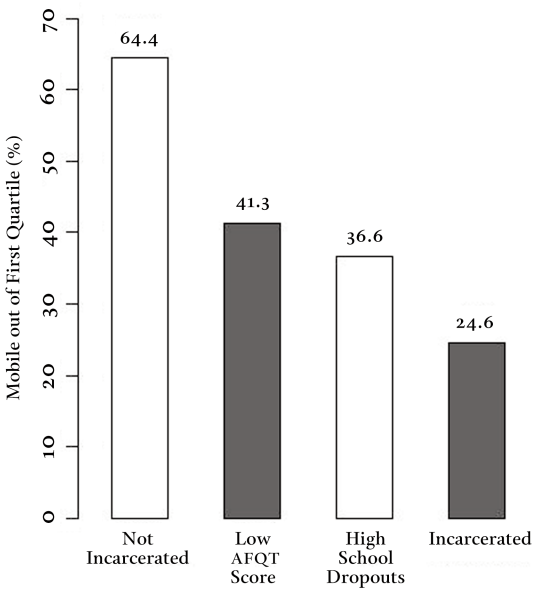
Intergenerational Inequality. Finally, the effects of the prison boom extend also to the families of those who are incarcerated. Through the prism of research on poverty, scholars find that the family life of the disadvantaged has become dramatically more complex and unstable over the last few decades. Divorce and nonmarital births have contributed significantly to rising rates of single parenthood, and these changes in American family structure are concentrated among low-income mothers. As a consequence, poor children regularly grow up, at least for a time, with a single mother and, at different times, with a variety of adult males in their households.

High rates of parental incarceration likely add to the instability of family life among poor children. Over half of all prisoners have children under the age of eighteen, and about 45 percent of those parents were living with their children at the time they were sent to prison. About two-thirds of prisoners stay in regular contact with their children either by phone, mail, or visitation.[6] Ethnographer Megan Comfort paints a vivid picture of the effects of men's incarceration on the women and families in their lives. She quotes a prisoner at San Quentin State Prison in California:

> Nine times out of ten it's the woman [maintaining contact with prisoners]. Why? Because your homeboys, or your

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

Figure 3
Twenty-Year Earnings Mobility among Men in the Bottom Quintile of Earnings Distribution in 1986, National Longitudinal Survey of Youth (NLSY) Men



AFQT stands for Armed Forces Qualifying Test.
Source: Becky Pettit, Bryan Sykes, and Bruce Western, "Technical Report on Revised Population Estimates and NLSY79 Analysis Tables for the Pew Public Safety and Mobility Project" (Harvard University, 2009).

> friends, if you're in that lifestyle, most the time they're gonna be sittin' right next to your ass in prison.... The males, they don't really participate like a lot of females in the lives of the incarcerated.... They don't deal with it, like first of all they don't like to bring to reality that you're in prison; they don't wanna think about that ... Or some of 'em just don't care. So the male's kinda like wiped out of there, so that *puts all the burden on the woman*.[7]

Partly because of the burdens of incarceration on women who are left to raise families in free society, incarceration is strongly associated with divorce and separation. In addition to the forced separation of incarceration, the post-release effects on economic opportunities leave formerly incarcerated parents less equipped to provide financially for their children. New research also shows that the children of incarcerated parents, particularly the boys, are at greater risk of developmental delays and behavioral problems.[8]

Against this evidence for the negative effects of incarceration, we should weigh the gains to public safety obtained by separating violent or otherwise antisocial men from their children and partners. Domestic violence is much more common among the formerly incarcerated compared to other disadvantaged men. Survey data indicate that formerly incarcerated men are about four times more likely to assault their domestic partners than men who have never been incarcerated. Though the relative risk is

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

very high, around 90 percent of the partners of formerly incarcerated report no domestic violence at all.

The scale of the effects of parental incarceration on children can be revealed simply by statistics showing the number of children with a parent in prison or jail. Among white children in 1980, only 0.4 of 1 percent had an incarcerated parent; by 2008 this figure had increased to 1.75 percent. Rates of parental incarceration are roughly double among Latino children, with 3.5 percent of children having a parent locked up by 2008. Among African American children, 1.2 million, or about 11 percent, had a parent incarcerated by 2008 (Figure 4).

The spectacular growth in the American penal system over the last three decades was concentrated in a small segment of the population, among young minority men with very low levels of education. By the early 2000s, prison time was a common life event for this group, and today more than two-thirds of African American male dropouts are expected to serve time in state or federal prison. These demographic contours of mass imprisonment have created a new class of social outsiders whose relationship to the state and society is wholly different from the rest of the population.

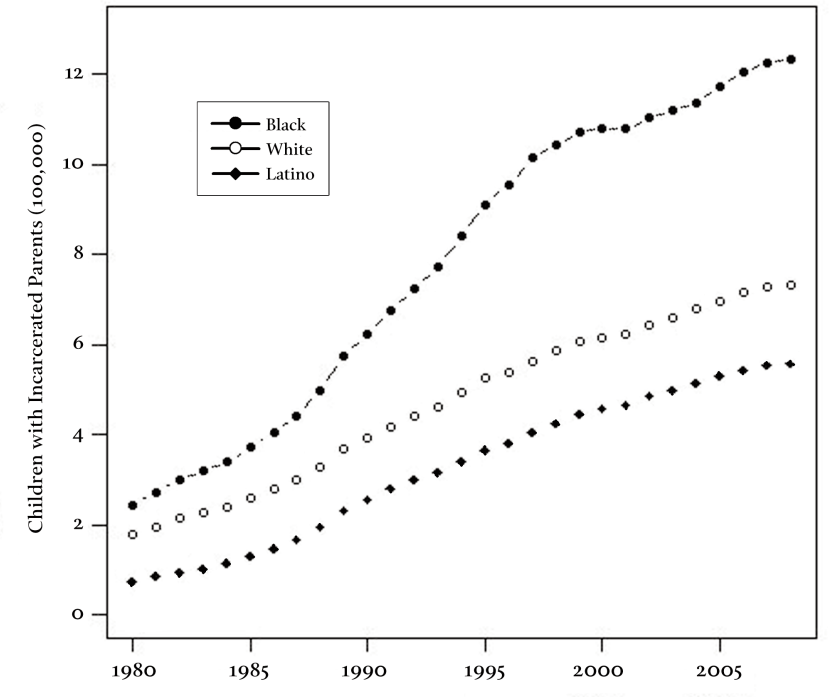
Social marginality is deepened by the inequalities produced by incarceration. Workers with prison records experience significant declines in earnings and employment. Parents in prison are likely to divorce or separate, and through the contagious effects of the institution, their children are in some degree "prisonized," exposed to the routines of prison life through visitation and the parole supervision of their parents. Yet much of this reality remains hidden from view. In social life, for all but those whose incarceration rates are highest, prisons are exotic institutions unknown to the social mainstream. Our national data systems, and the social facts they produce, are structured around normative domestic and economic life, systematically excluding prison inmates.

Thus we define carceral inequalities as invisible, cumulative, and intergenerational. Because they are so deeply concentrated in a small disadvantaged fraction of the population, the social and economic effects of incarceration create a discrete social group whose collective experience is so distinctive yet unknown that their disadvantage remains largely beyond the apprehension of public policy or public conversation. The redrawing of American social inequality by mass incarceration amounts to a contraction of citizenship – a contraction of that population that enjoys, in T. H. Marshall's words, "full membership in society."[9] Inequality of this kind threatens to be self-sustaining. Socioeconomic disadvantage, crime, and incarceration in the current generation undermine the stability of family life and material support for children. As adults, these children will be at greater risk of diminished life chances and criminal involvement, and at greater risk of incarceration as a result.

Skeptics will respond that these are false issues of social justice: the prison boom substantially reduced crime, and criminals should forfeit their societal membership in any case. The crime-reducing effects of incarceration are hotly debated, however. Empirical estimates of the effects of incarceration on crime vary widely, and often they turn on assumptions that are difficult to test directly. Researchers have focused on the sharp decline in U.S. crime rates through the 1990s, studying the influence of rising prison populations. Conservative estimates attribute about one-tenth of the 1990s crime decline to the

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

Figure 4
Number of Children under Eighteen with a Parent in Prison or Jail, 1980 to 2008



Source: Becky Pettit, Bryan Sykes, and Bruce Western, "Technical Report on Revised Population Estimates and NLSY79 Analysis Tables for the Pew Public Safety and Mobility Project" (Harvard University, 2009).

growth in imprisonment rates.[10] Though the precise impact of incarceration on crime is uncertain, there is broad agreement that additional imprisonment at high rates of incarceration does little to reduce crime. The possibility of improved public safety through increased incarceration is by now exhausted.

Studies of the effects of incarceration on crime also focus only on the short term. Indeed, because of the negative effects of incarceration on economic opportunities and family life, incarceration contributes to crime in the long run by adding to idleness and family breakdown among released prisoners. Scale matters, too. If the negative effects of incarceration were scattered among a small number of serious criminal offenders, these effects may well be overwhelmed by reduction in crime through incapacitation.

Today, however, clear majorities of the young men in poor communities are going to prison and returning home less employable and more detached from their families. In this situation, the institutions charged with public safety have become vitally implicated in the unemployment and the fragile family structure characteristic of high-crime communities. For poorly educated young men in high-incarceration communities, a prison record now carries little stigma; incentives to commit to the labor market and family life have been seriously weakened.

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

To say that prison reduces crime (perhaps only in the short run) is a spectacularly modest claim for a system that now costs $70 billion annually. Claims for the crime-reducing effects of prison, by themselves, provide little guidance for policy because other approaches may be cheaper. Measures to reduce school dropout, increase human capital, and generally increase employment among young men seem especially promising alternatives. Results for programs for very young children are particularly striking. Evaluations of early childhood educational programs show some of their largest benefits decades later in reduced delinquency and crime.[11] For adult men now coming out of prison, new evaluations show that jobs programs reduce recidivism and increase employment and earnings.[12] The demographic concentration of incarceration accompanies spatial concentration. If some portion of that $70 billion in correctional expenditures were spent on improving skills and reducing unemployment in poor neighborhoods, a sustainable and socially integrative public safety may be produced.

Much of the political debate about crime policy ignores the contemporary scale of criminal punishment, its unequal distribution, and its negative social and economic effects. Our analysis of the penal system as an institution of social stratification, rather than crime control, highlights all these neglected outcomes and leaves us pessimistic that widespread incarceration can sustainably reduce crime. The current system is expensive, and it exacerbates the social problems it is charged with controlling. Our perspective, focused on the social and economic inequalities of American life, suggests that social policy improving opportunity and employment, for young men in particular, holds special promise as an instrument for public safety.

Our perspective on inequality points to a broader view of public safety that is not produced by punishment alone. Robust public safety grows when people have order and predictability in their daily lives. Crime is just one danger, joining unemployment, poor health, and family instability along a spectrum of threats to an orderly life. Public safety is built as much on the everyday routines of work and family as it is on police and prisons. Any retrenchment of the penal system therefore must recognize how deeply the prison boom is embedded in the structure of American social inequality. Ameliorating these inequalities will be necessary to set us on a path away from mass incarceration and toward a robust, socially integrative public safety.

ENDNOTES

[1] We gratefully acknowledge Bryan Sykes, Deirdre Bloome, and Chris Muller, who helped conduct the research reported in this paper. This research was supported in part by a gift from The Elfenworks Foundation.

[2] In her essay for this issue, Candace Kruttschnitt shows that women's incarceration has pronounced effects by separating mothers from their children. The continued growth of women's incarceration rates threatens to have large effects on family life.

[3] Bruce Western, *Punishment and Inequality in America* (New York: Russell Sage Foundation, 2006); Caroline Wolf Harlow, *Education and Correctional Populations* (Washington, D.C.: Bureau of Justice Statistics, 2003).

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024

4 Harry J. Holzer, "Collateral Costs: Effects of Incarceration on Employment and Earnings Among Young Workers," in *Do Prisons Make Us Safer?* ed. Steven Raphael and Michael A. Stoll (New York: Russell Sage Foundation, 2009).

5 Devah Pager, *Marked: Race, Crime, and Finding Work in an Era of Mass Incarceration* (Chicago: University of Chicago Press, 2007).

6 Christopher Mumola, "Incarcerated Parents and Their Children" (Washington, D.C.: Bureau of Justice Statistics, 2000).

7 Megan Comfort, "In the Tube at San Quentin: The 'Secondary Prisonization' of Women Visiting Inmates," *Journal of Contemporary Ethnography* 32 (1) (2003): 82; emphasis original.

8 Christopher Wildeman, "Paternal Incarceration and Children's Physically Aggressive Behaviors: Evidence from the Fragile Families and Child Wellbeing Study," working paper 2008-02-FF (Fragile Families and Child Wellbeing, 2008).

9 T. H. Marshall, *Citizenship and Social Class* (Concord, Mass.: Pluto Press, 1992).

10 Western, *Punishment and Inequality in America*, chap. 7.

11 Pedro Carneiro and James J. Heckman, "Human Capital Policy," in James J. Heckman and Alan B. Krueger, *Inequality in America: What Role for Human Capital Policies?* (Cambridge, Mass.: MIT Press, 2003).

12 Cindy Redcross, Dan Bloom, and Gilda Azurdia, "Transitional Jobs for Ex-prisoners: Implementation, Two-Year Impacts, and Costs of the Center for Employment Opportunities (CEO) Prisoner Reentry Program" (MDRC, 2009).

Downloaded from http://www.mitpressjournals.org/doi/pdf/10.1162/DAED_a_00019 by guest on 29 March 2024