



National Poverty Center Working Paper Series

#08-16

October 2008

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A grant from the National Poverty Center at the University of Michigan supported this research. Any opinions expressed herein are those of the authors. We presented a version of this paper at the 2008 annual meetings of the Population Association of America, and thank Michael Massoglia, Yu Xie, and María Vélez for helpful comments. Please direct correspondence to Christopher J. Lyons, Department of Sociology, University of New Mexico, MSC05 3083, Albuquerque, NM 87131-1166; [clyons@umn.edu](mailto:clyons@umn.edu); (505) 277-0519

## **Abstract**

Spending time in prison has become an increasingly common life event for low-skill minority men in the U.S. The Bureau of Justice Statistics now estimates that one in three Black men can expect to spend time in prison during his lifetime. A growing body of work implicates the prison system in contemporary accounts of racial inequality across a host of social, health, economic, and political domains. However, comparatively little work has examined the impact of the massive increase in the prison system – and growing inequality in exposure to the prison system – on racial inequality over the life course. Using a unique data set drawn from state administrative records, this project examines how spending time in prison affects wage trajectories for a cohort of men over a 14-year period. Multilevel growth curve models show that black inmates earn considerably less than white inmates, even after considering human capital variables and prior work histories. Furthermore, racial divergence in wages among inmates increases following release from prison. Black felons receive fewer returns to previous work experience than white felons contributing to a widening of the racial wage gap. This research broadens our understanding of the sources of racial stratification over the life course and underscores the relevance of recent policy interventions in the lives of low-skilled minority men.

## COMPOUNDED DISADVANTAGE: RACE, INCARCERATION, AND WAGE GROWTH

A central concern in the study of racial stratification is the extent to which racial gaps in economic outcomes – wages, wealth, and exposure to poverty – change over the life course. Cognitive differences, educational investments, and differential work experience help explain racial inequality over the life course, yet scholars also point to the ability of federal policies to shape opportunities for economic achievement (Burstein 1979; Heckman 1989). Civil rights legislation and affirmative action programs, for example, accompanied narrowing racial gaps in wages, wealth, and exposure to poverty through at least the mid-1980s (Darity and Meyers 1998). Affirmative action programs increased the representation of blacks in government-sector and professional jobs (e.g., Grodsky and Pager 2001) decreasing wage inequality, enabling blacks to accumulate assets and protect themselves against poverty in later adulthood.

Despite such progress, fifty years after *Brown v. Board of Education* the economic fortunes of Black Americans still lag behind those of whites, and evidence suggests that racial gaps in economic outcomes widen over the life course. White men begin their work careers with higher initial wages than non-white men (Rosenfeld 1980) and racial disparity in wages widens further over the life cycle (Hoffman 1978; Wu 2007). Race gaps in wealth also grow over the life course; among those over age 65 median net worth among blacks is only one-fifth that of whites (Oliver and Shapiro 1995). And while acute among children, racial gaps in poverty narrow during the prime working ages only to widen among the elderly. The odds of experiencing poverty during later adulthood are significantly higher for blacks than whites (Rank and Hirschl 1999) and elderly black men are three times more likely to be poor than elderly white men (Census 2003).

Just as government policies advanced the economic fortunes of African Americans in the immediate post-civil rights period, they are now implicated in the production and maintenance of contemporary accounts of racial inequality. For example, although now illegal, America's history of de jure segregation and discrimination in lending practices continue to exacerbate racial inequality. Blacks

are concentrated in neighborhoods with high levels of poverty (Jargowsky 1997) and in homes of relatively low value (Oliver and Shapiro 1995). A growing body of evidence indicates living among poor neighbors correlates with poor economic outcomes including a greater risk of being poor (Harding 2003), and racial residential segregation may lead to slower appreciation of home values for blacks relative to whites and thus contribute to divergent economic fortunes (Massey and Denton 1993).

We join an increasing number of scholars in pointing to another key policy intervention in the lives of minorities that likely contributes to racial inequality: the massive build-up in the criminal justice system since the 1970s. One in 100 American adults are now living behind bars (PEW 2008) but incarceration disproportionately affects racial minorities, and in particular African Americans. Moreover, the relative rate of incarceration between blacks and whites has increased dramatically in recent history: in the 1930s, blacks were about 3 times more likely to be incarcerated than whites; in the 1990s, the ratio increased to more than 7 times that of whites (Duster 1997). Among recent cohorts of black high school dropouts, imprisonment is more common than marriage, and nearly 60% can expect to spend at least one year in prison before they turn 35 (Pettit and Western 2004).

Recent research on the consequences of incarceration for labor market outcomes indicates that criminal offenders and prison inmates face poor market prospects upon release, providing further evidence that differential exposure to prison by race may contribute to racial inequality. We argue that the recent upsurge in the criminal justice system – and its disproportionate effects on low-skill minority men – calls for further examination of the determinants of racial inequality over the life courses of those at risk of prison.

In this paper we examine how the experience of incarceration affects wage trajectories for black and white former inmates. Specifically, we ask whether the labor market consequences of incarceration differ for blacks and whites, net of important indicators of human capital, such as accumulated work experience. If so, do these differences in the experience of incarceration help explain racial stratification in wages over the life course for those at risk of prison? We move beyond cross-sectional research to explore work and wage dynamics over a 14-year period for a cohort of men who are admitted to and

released from prison. Drawing on a unique collection of administrative panel data on prison stays, education, and work in the legitimate labor market, we explore the relationship between incarceration, accumulated work experience, and wage trajectories via growth curve (or multilevel) modeling and investigate how racial differences in the impact of incarceration affect racial trends in wages over the life course.

## **INCARCERATION, RACE, AND THE LABOR MARKET**

Racial divergence in wages within specific age cohorts over the life cycle has been traced to differences in pre-market factors (e.g., cognition), investments in education, and differences in accumulated work experience (Antecol and Bedard 2004; Wu 2007). Recent research finds that differential work experience by race is arguably the key determinant of wage inequality over the life course, trumping the effects of pre-market factors, and investments in education, on wages in later life (Antecol and Bedard 2004).

Spending time in prison typically interrupts participation in the legitimate labor market, and incarceration has adverse impacts on the accumulation of work experience and wage growth (Western 2002). While incarceration may influence wage trajectories by removing felons from the labor market and eroding the value of their work experience while in prison, the effects of incarceration may not be equivalent for whites and blacks. Incarceration may have independent effects on wage trajectories of felons apart from lost work experience and spending time in prison may affect the value of work experience differently for black and white men.

### **The labor market consequences of prison**

Not all criminal justice sanctions incur a penalty on the job market, but the most severe sanction—prison incarceration—is found generally to have strong negative effects immediately after release. Estimates of the negative impact of prison time on earnings range between about 10 and 30 percent (Western, Kling and Weiman 2001). In addition, while wages tend to recover with time out of

prison (Pettit and Lyons 2007), research finds that ex-inmates experience slower earnings growth after release compared to other young men whose wages rapidly increase through their twenties and thirties. Prison is thought to channel young men into secondary labor market jobs characterized by high turnover rates and few returns to skill or seniority (Bushway 1996; Nagin and Waldfogel 1998; Western 2002).

Theoretical explanations for the relationship between incarceration and post-release employment and earnings typically emphasize the depreciation of human capital, as time in prison takes one out of the legitimate labor market (Becker 1968), the demand-side stigma of a criminal record, as many employers express a distaste for hiring ex-inmates (Pager 2003; Holzer 1996), and social capital, as criminals may be embedded in criminal networks and lack necessary contacts for conventional employment (Hagan 1993). These perspectives typically predict that spending time in prison should hamper employment prospects and slow wage growth after release. Given that most men experience some wage growth during prime working ages, a negative wage trajectory over time after incarceration may be unlikely. Yet, the wages of ex-inmates may increase more slowly than the trajectories of comparable individuals, leading to divergence over the life cycle (Western 2002). Research on incarceration effects typically confronts thorny methodological challenges in isolating the “treatment effect” of incarceration and in determining an appropriate counterfactual to an inmate sample. The key question in much incarceration effects research becomes whether post-release wage trajectories for ex-inmates differ from the wage trajectories of *comparable individuals who do not experience incarceration* (Bushway, Stoll, and Weiman 2007). As our focus in this paper is racial disparities in wage trajectories *among* ex-inmates, we are less concerned with generalizing to otherwise similar non-inmate populations.

We ask instead whether race conditions the experience of incarceration for inmates after release from prison, and whether this variation helps explain racial disparities in wages over the life course. Prominent perspectives on incarceration effects are generally *race-neutral* and offer few expectations for variation in the effect of incarceration for blacks and whites. Nonetheless, despite limited research, there are reasons to suspect the labor market consequences of imprisonment to vary for whites and blacks. For one, we might expect blacks to be relatively more disadvantaged by incarceration and less able to recover

from prison stays in the long term than whites. On the one hand, neoclassical models of labor market performance (e.g. Becker 1964) attribute any differences in black-white market vulnerability to racial disparities in human capital, as measured by factors such as educational investments and previous work experience. Recent research on wages over the life course for non-inmates typically confirm neoclassical expectations, and point to disparities in accumulated work experience as the most consequential factor determining black-white gaps in wage trajectories (Antecol and Bedard 2004; Wu 2007). For ex-inmates, the amount of time spent in prison should be an additional salient indicator of human capital depreciation, as incarceration reflects time out of the legitimate labor market and should disadvantage workers in the search for higher paying jobs. Net of these indicators of human capital, neoclassical models would expect few if any discernable differences in wage growth for inmates after release from prison.

On the other hand, the labor market vulnerability of black versus white ex-inmates may be rooted in more than just human capital differentials. In particular, the combination of minority status and criminal record may intensify stigma and employment discrimination for blacks relative to whites (Pager 2007a, 2007b). Drawing on social psychological research on the activation and application of stereotypes, Pager (2007b: 152) notes that the more closely an individual fits a stereotype along multiple dimensions, the more powerfully the stereotype is activated. Thus, the interaction between racial minority status and criminal record may act to confirm and intensify stereotypes about criminality and diminish the relevance of more positive characteristics (including previous work history and/or education). From the point of view of employers, the confirmation of racial stereotypes may encourage discrimination in the hiring process (Pager 2003; 2007a), or in the allocation of workplace rewards, including promotion, starting wages, and yearly raises. In contrast, because whites may not fit multiple dimensions of the prototypical criminal, employers may be more likely to overlook a criminal record, or be more persuaded to give whites a second chance. Criminal records for whites may be more likely attributed to “an isolated incident rather than an internal disposition” (Pager 2007b: 153; see also Bridges and Steen 1998).

The interaction between race and criminal record may operate via supply-side mechanisms as well, such as employee perceptions and attachment to work in the legitimate labor market. Furthermore,



employer actions and employee perceptions and attitudes about work are likely interrelated in complex ways (Darity and Mason 1998; Kirschhenman and Neckerman 1999). Given the perception of racial discrimination, black ex-inmates may have lower attachment to or greater discouragement with legitimate work. The discouraged worker effect may be especially prevalent among low-skilled workers in the service economy, where minority ex-inmates may experience “cultural dislocations” when interacting with the “upper-middle-class white world” (Bourgois 1995). Cultural adaptations to structural inequality may lead not only to observable human capital deficiencies but to the development of cultural codes among disenfranchised minorities that are incompatible with the culture of the workplace (Kirschhenman and Neckerman 1991;). Recent urban ethnographies (Anderson 1999; Bourgois 1995; Sullivan 1989) expose the cultural dislocations produced by the shift from manufacturing to service economies, in which the soft-skills valued by the “high-rise, office corridor culture is in direct contradiction to street culture’s definitions of personal dignity—especially for males who are socialized not to accept subordination” (Bourgois 1995: 143). Thus, race and criminal record may influence labor market outcomes via both demand and supply-side mechanisms by affecting employer perceptions of minority ex-inmates, or by shaping the perceptions that ex-inmates hold of the legitimate labor market. Regardless of the specific mechanisms, this perspective suggests that the relative price of incarceration may be greater for blacks than whites, and implies that incarceration may contribute to *divergence* in black-white wages after release even after controlling for previous work experience.

In contrast to perspectives expecting relative disadvantage for black ex-inmates, dramatic differences in the risk of incarceration by race may imply the opposite pattern: racial gaps in wages for former inmates may actually *converge* after release from prison. High rates of incarceration among black men may make it difficult for employers to distinguish black ex-convicts from other blacks. Consequently, employers may view all black men, especially low-skilled black men, as potential criminals (e.g., Holzer, Raphael and Stoll 2003). If race serves as a “master status”, all blacks will experience lower returns in the labor market than we expect given observable human capital, and incarceration will not necessarily have any *additional* effect on employment or wage outcomes (Pettit and

Lyons 2007). In contrast, among whites incarceration is less common and employers may view exposure to the criminal justice system as a clear indicator of untrustworthiness, low productivity, or future criminality. Therefore, white ex-convicts may experience more salient discrimination associated with spending time in prison because employers distinguish white ex-inmates from non-inmates (on the basis of time spent in prison, references from corrections officers, work experience gained in prison, etc.) and adjust employment offers and wages accordingly.

As few studies examine racial differences in wage trajectories of ex-inmates, these basic questions remain largely untested. Limited research on related employment outcomes, however, finds some evidence of racial differences in the effect of incarceration on employment. Recent audit studies show that ex-convicts are much less likely to be called for interviews than ex-convicts for both blacks and whites, but the effect of a criminal record appears much larger for blacks than whites (Pager 2003, 2007a; Pager, Western, and Sugie 2008). However, when examining racial differences in post-prison employment, Meyers (1983) finds that blacks are more responsive to post-release work incentives than whites and suggests that employers may find black ex-offenders indistinguishable from black non-offenders. Very few studies examine racial differences in the impact of incarceration on wages. One notable exception is Western's (2002) analysis of NLSY data, which finds that the *relative* impact of incarceration on wage growth is somewhat higher for whites than for blacks, perhaps because wages grow more slowly for blacks than whites in general, regardless of incarceration.

Using a rich set of administrative data, we contribute to the literature on racial stratification by investigating the effect of incarceration on differences in black-white wages over the life course. We pay particular attention to whether the effect of incarceration on wage trajectories varies by race net of cumulative work history.

## **DATA**

To investigate the relationship between incarceration, race, and wage growth, we compile administrative data from the Washington State Department of Corrections and Unemployment Insurance

(UI) records. Previous research on the effects of incarceration on labor market outcomes that rely on survey data have not always been able to isolate the effects of spending time in prison from other factors that jointly affect the probability of incarceration and poor labor market fortunes. Recent policy changes in the state of Washington allow us to collect a rich array of covariates that provide for a closer examination of alternative explanations for post-release effects on wage trajectories.

We began with a sample of men who were admitted to and released from a Washington state prison between 1990 and 2000. We link corrections data on these men to over 14 years of demographic, education, and earnings UI records from 1988 through 2002. Over 85% of the DOC sample was located in UI records, generating a sample of 19,184 individuals who spent time in Washington State prisons in the 1990s and were observed, at least once, in UI-covered employment. The data are organized into quarterly observations. Each quarterly observation indicates if the individual was incarcerated in the quarter and employed in a UI-covered job. We calculate average hourly wages in each quarter employed. Observations also include information on race, education, and criminal severity as well as conditions of most recent incarceration. Our data collection strategy ensures that we can compare pre- and post-incarceration employment experiences and wage trajectories: we observe earnings data for individuals *at least 2 years (8 quarters) before* their first complete stay in a Washington state prison in the decade, and *at least 2 years after* their release from prison.

From our larger sample of inmates, we select a cohort of black and white men who are between 18 and 24 years old at the first year of our observation window (1988), and follow them until 2002, when their ages range from 31-47. We thus concentrate on wage trajectories over prime working ages for these two racial groups, resulting in a sample of 2215 white and 710 black men. The vast majority of inmates in our sample (78.5%) serve only one prison term between 1990 and 2000, and we observe their wages before and after their prison stay through the first quarter of 2002. For inmates who are readmitted during our observation window, we only include quarterly information up to a new prison stay. That is, we restrict our analyses to quarters before and after the first observed incarceration in an

attempt to disentangle the effects of age from the cumulative effects of multiple prison spells (which, in our sample, is strongly correlated with age).

## **Wages**

Hourly wages are constructed by taking quarterly earnings divided by reported number of hours worked. Wage data are in constant dollars indexed to 1995. In approximately 4 percent of cases where there are positive quarterly wages, the hours worked data are either missing or misreported. We find few systematic differences in the misreporting of hours worked, and we exclude all quarterly observations with zero reported wages. We also limit our analysis to individuals with at least 2 observations with positive reported wages before and after incarceration. Table 1 shows average hourly wages for blacks and whites, including average first observed wages and last observed wages. Although first observed wages are similar for blacks (\$5.44) and whites (\$5.35), whites show considerably more average wage growth between first and last employment observation (+\$6.42 compared to +\$4.31 for blacks).

We realize that restricting our analysis to UI-covered earnings limits the generalizability of our results to the effects of incarceration on wage trajectories in the formal sector. We are unable to make claims about the impact of incarceration on other forms of economic activity. Nevertheless, UI-covered jobs represent jobs in the formal economy that carry with them employment protections, including unemployment insurance, and thus represent an important indicator of men's attachment to the paid labor force.<sup>1</sup>

We estimate wage trajectories as a function of incarceration, human capital (including work experience), and other demographic variables. Conceptually, we distinguish between time-variant and person-constant measures.

Table 1: Descriptive Statistics for Black and White Male Inmates in Washington State, 1988-2002

### **Time-variant measures**

To capture previous work experience, a key predictor of wage trajectories, we measure the proportion of previous quarters that an individual was reported working in UI-covered employment. An individual is coded as being employed if he has positive reported earnings within a quarter. We measure the time trend in wages in two ways. First, to capture the overall effects of age, we measure the *change* in chronological age in quarters. Specifically, we compute age in our first quarter of observation (in 1988) as current age minus 18. Thus, an individual aged 18 in 1988, for example, takes a value of 0 in the first quarter, 1 in the second quarter, and so on. Given the strong relationship between age during prime working years and wage growth, we expect this parameter to be significant and positive. To measure the wage trend after release from prison, we indicate the amount of time, in quarters, since release, which takes on a value of 0 in all quarters prior to release. This measure captures the *additional* effect of having a criminal record on subsequent wages, net of the overall age trend. Including both a general measure of change in age and a measure of time after incarceration allows us to compare earnings slopes before and after release from prison.

We also control for industry of employment. Table 1 shows the distribution of inmates by industry in the last observed job. Inmates are concentrated in service, construction, retail, and manufacturing jobs. This is especially notable for black inmates, with 68% concentrated in service and retail, and another 20% in manufacturing or construction. We do not detect any significant shifts in the distribution of ex-inmates across industries after incarceration. Finally, to account for yearly fluctuations in the economy, we control for year (1988-2002).

### **Time-invariant measures**

We measure information about the conditions of confinement and various demographic characteristics as time-invariant (person-constant) variables. Our models include information on length of incarceration, offense type (violent, drug, property, or other), whether the individual was involved in a work-release program during incarceration, and race and education. The average length of stay in quarters

is 6.41 for blacks and 6.13 for whites.<sup>2</sup> Thirty-six percent of black inmates and 43 percent of whites participated in work-release programs while incarcerated. We do not have specific information about the nature of such programs in Washington State, although we do find that participation is more common among older and longer-serving offenders, and those with particularly poor employment histories. We expect participation in work-release programs may contribute to improved wage trajectories, although if inmates who participate in these programs are particularly disadvantaged, any positive effects may be offset by existing liabilities.

The sample is relatively poorly educated. More than a quarter of black and white inmates are high-school dropouts, and only a fraction has received some college education.<sup>3</sup> Although some inmates acquire additional education while in prison, we do not have reliable time-varying measures of education attainment so we treat education as constant across individuals during our window of observation.

## **ANALYTICAL STRATEGY**

To examine the relationship between wage growth and incarceration, we employ multilevel modeling techniques, also called growth curve modeling (Singer and Willet 2003). We conceptualize our longitudinal measurements as having a hierarchical structure in which multiple quarterly observations (level 1) are nested within persons (level 2). The time-variant characteristics noted above, including our measures of time (change in age and time since release from prison), are indicated as level-1 variables, whereas time-invariant, person-constant characteristics are denoted level-2 variables.

This modeling strategy accounts for the interdependence of wage observations over time within individuals and does not require individuals to have the same number or spacing of measurements in the observation period. The latter advantage means that multilevel modeling uses all measurement occasions for each subject, and is therefore “superior to approaches that define the dependent variable as the growth in wages between two fixed points in time” (Fuller 2008: 165). Random-intercept multilevel regression (Snijders and Bosker 1999) also estimates average growth trajectories and individual variation around the mean.

For the models presented below, we pool black and white inmates together and explore the effect of race (BLACK) on wage trajectories. An alternative strategy is to disaggregate by race, estimate separate models for black and whites, and compare coefficients across models. Doing so results in substantively identical conclusions to those presented below; we opt for the pooled model for ease of presentation.

Multilevel regression simultaneously estimates two equations, one modeling level-1 characteristics within persons, and the other modeling level-2 variation between individuals. We can express the level-1 model of wage trajectories as:

$$\ln \text{WAGE}_{it} = \pi_{0i} \text{INTERCEPT}_{it} + \pi_{1i} \text{AGE GROWTH}_{it} + \pi_{2i} \text{QUARTERS SINCE RELEASE}_{it} + \pi_{3i} \text{WORK EXPERIENCE}_{it} + \pi_{4i} \text{YEAR}_{it} + \pi_{5-11i} \text{INDUSTRY}_{it} + r_{it} \quad (1)$$

The residual ( $r_{it}$ ) captures the unmeasured quarter-to-quarter variation in wages for a given individual, often referred to as the level-1 random effect. The second equation takes individual variation into account in a level-2 model, and captures the influence of measured and unmeasured person-constant variables on the intercept. More specifically:

$$\pi_{0i} = \beta_{00} + \beta_{01r} \text{BLACK}_{ri} + \beta_{02r} \text{EDUCATION}_{ri} + \beta_{03r} \text{QUARTERS INCARCERATED}_{ri} + \beta_{04r} \text{OFFENSE TYPE}_{ri} + \beta_{05r} \text{WORK RELEASE}_{ri} + u_{0i} \quad (2)$$

The residual ( $u_{0i}$ ) can be viewed as a random-intercept variance, or the systematic deviation from the average intercept for a given individual, with an assumed mean of 0.

The model also allows for testing cross-level interactions (i.e. between level 1 and level 2 variables). Of central interest to us is whether time since release from prison interacts with race. We also explore cross-level interactions between race and other time-variant measures, including work experience, age, and year.

## RESULTS

Before examining multivariate wage growth models, Figure 1 presents unadjusted mean wages by race for our cohort of men (who were between ages 18-24 in 1988). The figure charts wage trajectories for 8 quarters (two years) before and after the first observed incarceration stay. Despite some fluctuation in average wages, blacks consistently earn lower hourly wages than whites before and after incarceration. Interestingly, the earning trend prior to incarceration, while positive in slope, is somewhat *flatter* than earning growth after incarceration for both blacks and whites. That is, both blacks and whites appear to have steeper earning trajectories after release from prison than before they experience incarceration.<sup>4</sup> This may partly reflect the general trend for increased wage trajectories over the life course, especially during prime working ages. However, the graph suggests a widening wage gap for blacks and whites after incarceration for this cohort. In particular, in the quarters after release from prison, the earning trend for whites appears steeper than the earning trend for blacks, suggestive of wage divergence over the life course.

Figure 1: Hourly Wages (Unadjusted) Before and After 1<sup>st</sup> Incarceration

We next explore whether these patterns hold while adjusting for relevant time-constant and time-variant variables (especially age and prior work) in multilevel models. Table 2 presents multivariate models predicting log hourly wages for our pooled cohort of inmates. Looking first at model 1, we see a positive general trend for age (age since 1988) and year, as well as a positive trend for wage growth after incarceration (quarters since release). Even after accounting for wage growth due to age, the earnings slope increases in quarters after release from prison, as suggested by Figure 1. The time-invariant (person-constant) estimates reveal that blacks earn significantly lower hourly wages than whites on average, net of controls for industry, education, offense type, and sentence length. To explore the degree to which racial differences in wages are a product of differences in accumulated work histories, model 2 controls for prior work experience. As expected, prior work experience significantly predicts wage trajectories. Prior work experience also explains a substantial proportion of the black-white gap in earnings: net of prior



work experience, the coefficient for Black is reduced about 28% (from -.067 to .048). However, the race effect is still significant and negative, suggesting that prior work experience does not completely account for differences in wage trajectories by race. Likewise, the coefficient for quarters since release is cut in third, but is still positive and significant after controlling for work experience.

Table 2: Multilevel Regression of Black and White Log Hourly Wage Trajectories

Cross-level interactions with race and time-variant measures test whether the effects of incarceration, prior work experience, age, or year vary by race. Model 3 presents two significant cross-level interactions (for parsimony, non-significant cross-level interactions are removed from the model). The negative coefficient for black\*quarters since release indicates divergence in post-release wage trajectories for blacks and whites. Black wages increase at a slower rate than white wages after release from prison, net of the positive age trend (which does not vary significantly by race). This generally confirms the post-release trends illustrated in Figure 1 for unadjusted wages. Furthermore, although more stable work histories predict higher earnings slopes for both blacks and whites, blacks appear to have lower returns to prior work experience than whites.

Table 2 also presents the effects of education, length of confinement, offense type, and participation in work-release programs while in prison, all treated as person-constant measures. The more fully specified model 3 shows few effects for offense type or conditions of confinement. Educational attainment, however, is significantly related to wage growth as expected, with individuals earning college or high school credentials experiencing more wage growth than high school dropouts. We also tested interactions between race and these person-constant measures, but generally found no evidence of race differences. The exception was that blacks received fewer returns to a college education than whites ( $p < .1$ ). However, this effect disappears once controlling for the interaction between race and prior employment experience.

## CONCLUSIONS

The expansion of the U.S. criminal justice system may represent the greatest public policy intervention in the lives of the American poor since the late 20th century. Despite declines in violent crime through the 1990s, the prison population continued to escalate. Increased criminalization of property crimes and drug offenses has generated a population of inmates that is increasingly defined by race and class. A clear majority of low-skill minority men will spend at least part of their lives in state custody. To better understand the impact of incarceration on labor market experiences of those most at risk, we explored whether incarceration affects wage trajectories of ex-inmates, and whether the impact of incarceration varied by race. Drawing on a unique collection of longitudinal administrative data on earnings and incarceration history for a cohort of inmates in Washington State, we find evidence that post-release wages increase at a slower rate for blacks than for whites, indicating a widening in the black-white wage gap over time after incarceration. In light of previous research documenting the negative effect of incarceration on earnings over the life course relative to those who do not experience prison (e.g. Western 2002), our study points to the compound disadvantage faced by black relative to white ex-inmates.

Our finding of racial differences in the effects of incarceration on wage growth is generally consistent with perspectives on the intensification of racial stigma for black ex-inmates. The combined effects of racial minority status and criminal record may interact to disadvantage blacks compared to whites (Pager 2007a, 2007b). The intensification of stigma generally emphasizes demand-side mechanisms of employer allocation of resources or discrimination. That is, because black ex-inmates confirm multiple dimensions of criminal stereotypes, employers may more readily discriminate against blacks with criminal records than white ex-inmates. Racial differences in the stigma of incarceration may lead to outright disadvantage in the hiring process (Pager 2003; Pager, Western and Sugie 2008), leading to lower employment stability for blacks after release from prison, or to other employment decisions such as denial of promotion or lower starting wages, which would relegate blacks to lower earning profiles.

Given the stigma of a criminal record and the perception of employment barriers for ex-inmates, race and incarceration history may also interact to influence wage trajectories via supply-side mechanisms by discouraging workers and decreasing attachment to the legitimate labor market. Numerous scholars note that employer actions and employee perceptions and attitudes about work are likely interrelated in complex ways (Darity and Mason 1998; Kirschhennman and Neckerman 1999). In his ethnography of drug dealers in Spanish Harlem, Bourgois (1995: 115) notes that many tried to exit the drug world and search for legitimate employment, and that “service work in professional offices is the most dynamic place for ambitious inner-city youths to find entry-level jobs if they aspire to upward mobility.” However, not only are low-skilled minorities typically deficient in the human capital necessary for upward mobility in many service jobs, they often experience disadvantage in cultural capital: the norms of high-rise culture often directly contradict the norms of inner-city street life salient to many ex-inmates.

Although we are not able to observe directly the mechanisms by which black ex-inmates experience slower wage growth than white ex-inmates, we find that previous work experience does seem to explain some, but not all, of the difference in black-white wage trajectories. Recent research isolates work experience as the principal explanation for black-white divergence in wages over the life course (Antecol and Bedard 2004; Wu 2007), but our results suggest that wage divergence exists net of any differences in accumulated employment experience (in UI-covered jobs) for blacks and whites. The intensification of racial stigma for black ex-inmates may be less captured by employment instability than the allocation of wages or the relegation of black ex-inmates to jobs with less potential for wage growth.

We should note, however, that our measure of work experience does not necessarily capture job tenure. It may be that white ex-inmates are more likely than blacks to stick with one job and reap the benefits that tenure may afford, such as promotion, seniority, and greater wage growth. If we were able to observe tenure precisely, we might be able to explain a greater proportion of the gap in black and white earnings growth, before and after incarceration.

In addition to racial variation in the effects of incarceration on wage trajectories, we find that black ex-inmates receive fewer returns to prior work experience than whites. Given the importance of cumulative employment experience for wage growth over the life course, this finding is cause for concern and warrants further investigation. We caution, however, that our measure of work experience is a rough approximation of prior employment and may be capturing some unobserved heterogeneity in the nature of work experience for blacks and whites. For instance, the interaction between race and work experience may be a function of racial differences in job tenure, length of unemployment spells, or the level of employment experience. Future research should explore the heterogeneity in employment experiences for blacks and whites to better understand the dynamics of racial inequality in wage growth over the life course.

Despite these unanswered questions, this study broadens our understanding of how and why wage disparity changes over the work lives of blacks and whites by drawing further attention to the role of the prison expansion for contemporary racial inequality. As other scholars point to America's history of de jure segregation and lending discrimination as policy interventions consequential to contemporary racial stratification, our research joins a growing number of studies that implicate the criminal justice system as well in the persistence and/or exacerbation of racial inequality (Pettit and Western 2004; Western 2006). Perhaps the most striking characteristic of the criminal justice system in modern time is the disproportionate risk of imprisonment by race. Disproportionate minority contact with the criminal justice system exposes a much greater proportion of blacks to the negative labor market consequences of incarceration, leading to the intensification and accumulation of disadvantage relative to whites. Insofar as incarceration disrupts important life course transitions in employment (Raphael 2007; Western 2002), differential risk of incarceration by race can contribute to divergence in wages for blacks and whites over the life course. Furthermore, not only are blacks at higher risk for experiencing the negative effects of incarceration than whites, our results suggest that *among inmates*, the experience of incarceration varies by race, thereby compounding the disadvantaged faced by blacks.

## END NOTES

1. Nevertheless, reliance on UI-covered jobs may still bias our estimates of wage trajectories and employment experience, although it is difficult to have strong a priori expectations as to the direction of this potential bias. On the one hand, administrative records may understate employment and earnings, particularly for young men with a prior arrest (Kornfeld and Bloom 1999). UI reports understate the incomes of those in day labor and other informal work (uncovered rather than out-of-state jobs). If ex-inmates are moving from work that is covered by UI into work that isn't, reliance on UI records may lead to an overly pessimistic estimates of incarceration effects. On the other hand, if ex-inmates move from uncovered to covered jobs, reliance on UI records could lead to overly optimistic estimates of incarceration effects.
2. By including only inmates incarcerated and released between 1990 and 2000, we may under-represent offenders with longer prison sentences. However, the median sentence length for our sample approximates that found in the state as a whole. While we clearly under-observe severe offenders with long prison sentences, our data is representative of non-violent drug and property offenders who typically serve shorter prison stays than violent offenders.
3. For about 10% of our sample, education data is missing. To minimize loss of cases to missing data, we flag missing education data and include this as a separate variable (see Table 1).
4. Of course, this comparison can say nothing about wage growth in the *absence of incarceration*.

## REFERENCES

- Anderson, Elijah. 1999. *The Code of the Street: Decency, Violence and the Moral Life of the Inner City*. New York: Norton.
- Antecol, Heather and Kelly Bedard 2004. "The Racial Wage Gap: The Importance of Labor Force Attachment Differences across Black, Mexican and White Men." *The Journal of Human Resources* 39: 564-83.
- Becker, Howard S. 1963. *Outsiders: Studies in the Sociology of Deviance*. New York: Free Press.
- Becker, Gary. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76:169-217.
- Bridges, George S. and Sara Steen. 1998. "Racial Disparities in Official Assessments of Juvenile Offenders: Attribution Stereotypes as Mediating Mechanisms." *American Sociological Review* 63(4):554-70.
- Bourgois, Philippe. 1996. *In Search of Respect: Selling Crack in El Barrio*. Cambridge: Cambridge University Press.
- Burstein, Paul. 1979. "Equal Employment Opportunity Legislation and the Income of Women and Non-whites." *American Sociological Review* 44:367--391.
- Bushway, Shawn. 1998. "The Impact of an Arrest on the Job Stability of Young White American Men." *Journal of Research in Crime and Delinquency* 35:454-79.
- Bushway, Shawn, Michael A. Stoll and David F. Weiman. 2007. "Introduction." Pp. 1-26 in *Barriers to Reentry? The Labor Market for Released Prisoners in Post-Industrial America*, edited by S. Bushway, M. Stoll, and D. Weiman. New York: Russell Sage Foundation.
- U.S. Census Bureau. 2003. Poverty Status of the Population in 2001 by Sex, Age, Race and Hispanic Origin: March 2002. Current Population Survey, March 2002, Racial Statistics Branc, Population Division. <http://www.census.gov/population/socdemo/race/black/ppl-164/tab16.pdf>
- Darity, William A. and Samuel L. Myers. 1998. *Persistent Disparity: Race and Economic Inequality in the United States since 1945*. Northampton, MA: Elgar.
- Darity, William A. and P.L. Mason. "Evidence on Discrimination in Employment: Codes of Color, Codes of Gender." *Journal of Economic Perspectives* 12(2): 63-90.
- Duster, Troy. 1997. "Pattern, Purpose, and Race in the Drug War. Pp. 260-287 in *Crack in America*, edited by Craig Reinerman and Harry Levine. Berkeley: University of California Press.
- Grodsky, Eric and Devah Pager. 2001. "The Structure of Disadvantage: Individual and Occupational Determinants of the Black-White Wage Gap." *American Sociological Review* 66: 542-67.
- Fuller, Slyvia. 2008. "Job Mobility and Wage Trajectories for Men and Women in the United States." *American Sociological Review* 73: 158-183.
- Hagan, John. 1993. "The Social Embeddedness of Crime and Unemployment." *Criminology* 31:465--91.

- Harding, David. 2003. "Counterfactual Models of Neighborhood Effects: The Effect of Neighborhood Poverty on Dropping Out and Teenage Pregnancy." *American Journal of Sociology* 109(3): 676-719.
- Heckman, James. 1989. "The Impact of Government on the Economic Status of African Americans." Pp. 50--80 in *The Question of Discrimination*, edited by Steven Shulman, William Darity, and Robert Higgs. Middletown, CT: Wesleyan University Press.
- Hoffman, Saul. 1978. "Black-white Earnings Differences over the Life-cycle." Pp. 247-71 in *Five Thousand American Families—Patterns of Economic Progress*, edited by Greg Duncan and James Morgan. Ann Arbor, MI: University of Michigan Institute for Social Research.
- Holzer, Harry, Steven Raphael, and Michael Stoll. 2003. "Employment Barriers Facing Ex-Offenders." Paper prepared for Reentry Roundtable on "The Employment Dimensions of Prisoner Reentry: Understanding the Nexus between Prisoner Reentry and Work." New York: New York University, May 19-20.
- Holzer, Harry. 1996. *What Employers Want: Job Prospects for Less-Educated Workers*. New York: Russell Sage Foundation.
- Jargowsky, Paul. 1997. *Poverty and Place: Ghettos, Barrios, and the American City*. New York: Russell Sage Foundation.
- Kirschhenman, Joleen and Kathryn Neckerman. 1999. "'We'd Love to Hire Them, But...': The Meaning of Race for Employers." Pp. 152-161 in *Race and Ethnic Conflict*, J. Kirschhenman and K. Neckerman, eds. Boulder, CO: Westview.
- Kornfeld, Robert and Howard Bloom. 1999. "Measuring Program Impacts on Earnings and Employment: Do Unemployment Insurance Wage Records Agree with Survey Reports of Individuals?" *Journal of Labor Economics* 17:168-197.
- Massey, Douglas and Nancy Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.
- Myers, Samuel L. 1983. "Racial Differences in Postprison Employment." *Social Science Quarterly* 64(3): 655-69.
- Nagin, Daniel and Joel Waldfogel. 1998. "The Effect of Conviction on Income Through the Life Cycle." *International Review of Law and Economics* 18:25--40.
- Oliver, Melvin and Thomas Shapiro. 1995. *Black Wealth/White Wealth: A New Perspective on Racial Inequality*. New York: Routledge.
- Pager, Devah. 2003. "The Mark of A Criminal Record." *American Journal of Sociology* 108: 937--975.
- Pager, Devah. 2007a. *Marked: Race, Crime, and Finding Work in an Era of Mass Incarceration*. Chicago: U of Chicago Press.
- Pager, Devah. 2007b. "Two Strikes and You're Out: The Intensification of Racial and Criminal Stigma." Pp. 151-173 in *The Impact of Incarceration on Labor Market Outcomes*, David Weiman, Shawn Bushway, and Michael Stoll (eds). New York: Russell Sage Foundation.

Pager, Devah, Bruce Western, and Naomi Sugie. 2008. "Sequencing Disadvantage: Barriers to Employment Facing Young Black and White Men with Criminal Records." Paper presented at the annual meetings of the American Sociological Association, Boston.

Pettit, Becky and Bruce Western. 2004. "Mass Imprisonment and the Life Course: Race and Class Inequality in U.S. Incarceration." *American Sociological Review* 69:151--169.

Pettit, Becky and Christopher J. Lyons. 2007. "Status and the Stigma of Incarceration: The Labor Market Effects of Incarceration by Race, Class, and Criminal Involvement." Pp. 203-226 in *Barriers to Reentry? The Labor Market for Released Prisoners in Post-Industrial America*, edited by S. Bushway, M. Stoll, and D. Weiman. New York: Russell Sage Foundation.

PEW Research Center for the States (PEW). 2008. "One in One Hundred: Behind Bars in America in 2008." <http://www.pewcenteronthestates.org/uploadedFiles/One%20in%20100.pdf>

Rank, Mark R. and Thomas A. Hirschl. 1999. "The Economic Risk of Childhood in America: Estimating the Probability of Poverty across the Formative Years." *Journal of Marriage and the Family* 62:1058-67.

Raphael, Steven. 2007. "Early Incarceration Spells and the Transition to Adulthood." Pp. 278-306 in Sheldon Danziger and Cecilia Rouse (Eds) *The Price of Independence: The Economics of Early Adulthood*. New York: Russell Sage Foundation.

Rosenfeld, Rachel A. 1980. "Race and Sex Differences in Career Dynamics." *American Sociological Review* 45:583-609.

Singer, Judith D. and John B. Willet. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Toronto, Canada: Oxford University Press.

Snijders, Tom A. B. and Roel J. Bosker. 1999. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. London, UK: Sage publishers.

Sullivan, Mercer L. 1989. *Getting Paid: Youth Crime and Work in the Inner City*. Ithaca: Cornell University Press.

Western, Bruce. 2002. "The Impact of Incarceration on Wage Mobility and Inequality." *American Sociological Review* 64:526--546.

Western, Bruce, Jeffrey R. Kling, and David F. Weiman. 2001. "The Labor Market Consequences of Incarceration." *Crime and Delinquency* 47:410--27.

Western, Bruce. 2006. *Punishment and Inequality in America*. New York: Russell Sage Foundation.

Wu, Huoying, 2007. "Can the Human Capital Approach Explain Life-cycle Wage Differentials between Races and Sexes?" *Economic Inquiry* 45(1): 24-39.



**Table 1. Descriptive Statistics for Black and White Male Inmates in Washington State, 1988-2002 (cohort aged 18-24 in 1988)**

	Blacks	Whites
Mean wage (\$1995)	8.14	9.15
First observed wage	5.44	5.35
Last observed wage	9.81	11.77
Work experience (of wage sample)	46.38%	54.80%
Age (in 1988)	20.73	20.76
Mean length of follow-up, post-release	13.95	13.65
Mean sentence length	6.41	6.13
Offense type		
Violent	39.72	40.81
Drug	44.65	20.00
Property	14.78	36.03
Other	0.85	3.16
Work release	36.06	43.00
Education		
Less than HS	27.18	25.32
HS/GED	57.04	60.01
Some college	5.92	3.16
Missing	9.86	11.51
Industry (last job)		
Construction	9.29	22.62
Manufacturing	10.85	15.94
Transportation	4.51	3.56
Wholesale Trade	3.94	4.42
Retail	24.79	18.92
Agriculture/Mining	1.27	5.01
Finance/Pub. Admin.	2.11	1.67
Service	43.24	27.86
N	710	2215

**Table 2. Multilevel Regression of Black and White Log Hourly Wage Trajectories, 1988-2002 (Washington Male Inmates aged 18-24 at 1988)**

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
<b>Fixed Effects</b>						
<i>Level 1 (time variant)</i>						
Intercept	1.307***	.014	1.200***	.013	1.194***	.013
Time:						
Age since 1988	.026***	.002	.023***	.002	.023***	.002
Quarters since incarceration	.003***	.001	.002***	.0003	.003***	.001
Quarters since incarceration * Black					-.002*	.001
Previous work experience			.257***	.007	.268***	.012
Previous work experience * Black					-.056**	.025
Year	.044***	.002	.048***	.002	.048***	.002
Industry <sup>a</sup> :						
Construction	.383***	.011	.379***	.005	.379***	.010
Manufacturing	.171***	.009	.164***	.005	.164***	.008
Transportation	.227***	.016	.221***	.009	.221***	.015
Wholesale/Trade	.095***	.013	.091***	.008	.092***	.013
Retail	-.047***	.008	-.048***	.005	-.048***	.007
Agriculture/Mining	.111***	.013	.107***	.008	.107***	.013
Finance/Pub. Admin	.066**	.024	.068**	.023	.068**	.023
<i>Level 2 (time constant)</i>						
Black	-.067***	.010	-.048***	.009	-.018	.011
Education <sup>b</sup> :						
Some college	.089***	.021	.083***	.022	.081***	.021
High school/GED	.050***	.010	.038***	.010	.038***	.096
Missing education	.066***	.016	.051**	.015	.052**	.015
Offense type <sup>c</sup> :						
Drug	.007	.011	.008	.010	.007	.010
Property	-.026**	.010	-.020**	.010	-.021**	.010
Other	.020	.027	.013	.026	.010	.023
Quarters incarcerated	-.007***	.002	-.001	.002	-.001	.002
Work release	.010	.009	.006	.008	.006	.008
<b>Variance Components</b>						
Within-person variance	.318***		.316***		.316***	
Intercept	.210***		.197***		.197***	
N (persons)	2925		2925		2925	
N (quarters)	51530		51530		51530	
Deviance	34220.10		33067.31		22062.32	

**Notes:**

- SE represents robust standard errors
- \* p < .05; \*\* p < .01; \*\*\* p < .001 (two-tailed)
- <sup>a</sup> Referent is service industry
- <sup>b</sup> Referent is less than high school
- <sup>c</sup> Referent is violent offense

**Figure 1. Hourly Wage (unadjusted) Before and After 1st Incarceration, Washington State  
Male Inmates 1988-2002 (Aged 18-24 in 1988)**

